



**W**e printers may not want to admit it, but consumer product companies (CPCs) have been some of the unsung heroes in the flexographic segment of the printing industry. Many recent advances are easily attributed to demands from CPCs and the designs generated by their designers. Printers and suppliers rose to the challenge. As a result, we're producing packaging at a level that rivals the quality of gravure.

Printers know that not all designs can be reproduced equally. There are limits to flexographic printing. Barriers are being overcome through new processes and technologies—plates capable of consistently holding smaller dot sizes, enhanced dot-screening techniques, and the widespread acceptance of expanded gamut printing. Still, some of the most creative and artistic designs may not lend themselves to quality reproductions.

With printers and prepress providers having a more extensive knowledge of flexography, the onus is on them to pass this information on to designers and CPCs and to guide them through the production process. Think of it as a set of design considerations rather than a how-to manual.


Atul Gawande wrote a fascinating and prudent defense of the basic checklist in his 2009 book *The Checklist Manifesto*. In it, he argues that, "We need a different strategy for overcoming failure, one that builds on experience and takes advantage of the knowledge people have, but somehow also makes up for our inevitable human inadequacies." (p. 13). His solution: a checklist.

What follows in this article is less of a data-driven research study and more of a checklist for printers and prepress providers to use when preparing and working with designers and CPCs. It's a common sense approach that has been put together using first- and second-hand experience from printers and prepress providers in the industry.

#### FLEXO 101

In a printer's perfect world, designers would have a complete understanding of separations and a full knowledge of the disadvantages and drawbacks of flexographic printing. They don't. The first

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step to ensuring quality reproductions is to understand this and educate designers on various aspects of flexography that we may take for granted. On the list: dot gain, the need for minimum dots in screens and process, the ways in which different types of anilox rolls transfer different amounts of ink, etc. CPCs should particularly be aware of this as they are the facilitators of collaboration in the work process.

Section 2.2 of *FIRST* (Flexographic Image Reproduction Specifications & Tolerances) describes the various responsibilities of the CPC, the production designer, the prepress provider and the printer when preparing flexographic designs for print. While it tasks the CPC with facilitating communication between the other three groups, a responsible printer and prepress provider should not rely on this leadership for collaboration. Using *FIRST* as a guideline, the printer and prepress provider should partner and develop common design guidelines that fit the capabilities of the specific printing process being used.

A good rule of thumb for printers and prepress providers is to have some sort of basic presentation material available on some elementary rules of flexography, to provide new clients before beginning work. With client acquisition being markedly more expensive and difficult than client retention, printers and prepress providers know that ensuring quality reproductions with new business can be critical. CPCs can then distribute this presentation to the design firms that they are working with.

Good communication on the front end of a process increases the likelihood that designs can be effectively executed in production. It could also potentially reduce the time that it takes to complete a job. Optimally, CPCs should engage both the printer and prepress provider during conceptual design. At a minimum, printers and prepress providers should engage one another in a printing assessment after a design has been submitted for production. Put simply, printing assessments are a cooperative meeting of the minds



to discuss different facets of a job: the best ways to separate a job, placement and build of control targets and printer marks, web edge treatment, etc.

### EDUCATION COMES FIRST

I'd wager that the least read section of the *FIRST* manual is the Design section. That should change. Those 42 pages contain an abundance of useful information and a general walk-through of the information that designers will need to know as they begin their work. Printers and prepress providers should be fluent in all of this information and encourage the designer and the CPCs to adopt *FIRST* as a means to standardize and improve communication.

The Design section of *FIRST* includes many different considerations for designers. All can potentially cause problems or delay production timelines, if not handled correctly on the front end. Thorough descriptions of the advantages of working in layers, considerations for drop shadows, problems with banding in vertical vignettes and gradients, proper file naming conventions, "picket fence" barcodes vs. "ladder" barcodes, etc., are offered. It also contains direction on one of the most fundamentally important aspects of the production workflow: an understanding of the template layout.

A common problem I've seen from designers is this misunderstanding of the die drawing. All die-cut or slit package types—whether they be flexible pillow bags, stand-up pouches, fluted boxes or labels—require some sort of template file for graphics placement. These templates, at a minimum, should include dimensions and live print areas. The printer,

prepress provider or CPC should provide them to the designer as early as possible in the production process.

Obviously, the more detail provided in the die drawing, the less chance that the designer will misinterpret the template and place print elements in inappropriate areas. For example, in a pillow bag for potato chips printing on wide web film, an effective die drawing would:

- Indicate that no copy or print should fall in an eyemark lane.
- Include the proper location for the weight mark.
- Specify the top and bottom web edge treatment for the plate break.

### BEYOND FIRST

*FIRST* is an incredibly useful resource for designers. There are, however, additional factors for designers to consider that go beyond the scope of the manual. I intend to devote the rest of this article to mentioning some of these, and I propose that printers and prepress providers educate designers and CPCs on why these matters can cause press problems.

Section 7.5 of *FIRST* contains a paragraph devoted to factors that influence hard edges and dirty print, but it's a brief paragraph that does not provide a large amount of detail. I've seen a number of designs that contain shadows created with the Gaussian Blur filter or Drop Shadow effect in Illustrator. As presented, the shadows will fade into a white or another color that does not contain a minimum dot percentage of the shadow color. Onscreen, it looks fine. On press, it's another

story, particularly if the shadow sits largely offset from the object casting it.

While advanced screening techniques or flat-top dots might lessen the printed effect of "puddled" shadows, they're not perfect solutions. Both designers and CPCs should be aware of how these shadows will print without fading into minimum dot coverage.

Similarly, a common design technique is to have a depth of field photography shot fade into white or another color without a minimum dot percentage. Once again due to flexographic dot gain, a fade is going to look very artificial and create a hard, "puddled" edge around a blurred object. In order to be effective, photography that contains depth of field, should fade into a background color that carries some of the same minimum dots used in the image. It's a lot to ask of designers, because it can be limiting to their creativity, but in these instances, you want them to think like a separator.

Another common consideration that I've seen numerous times is the use of combination colors. By this, I'm referring to instances of a color that prints as both a solid and a screen, but is treated as the same separation. It requires the designer to think like a separator and have a basic understanding of anilox rolls. Because fine screens and dense, full coverage solids require different anilox roll counts to transfer the correct amount of ink, they often need to be thought of as unconnected separations. Designers may innocently screen an instance of color or apply a transparency to an object without considering the effect that this may have on the printing, unknowing that it may add a separation to the design.

One of the more unsuspecting design hiccups for some printers is the use of large horizontal bars or stripes of color in a package design. Think of it as a chunk missing from your tire: as a plate turns around the cylinder during printing, the areas without the stripes of color can bounce as it goes around at high speeds, much like a car tire as it drives along the road. Bounce can be limited by staggering jobs across the wide web, but it's not a perfect solution. As a result, the print may "band"

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or "ghost," and the printer will have to lessen the effect by slowing down the press. These horizontal stripes can be major speed inhibitors for some press operators.

Designers should also be aware of the unpredictability of overprinting spot color reproduction. As prepress providers generally do not color profile spot colors, they will not be able to accurately simulate the appearance that a process or spot color overprinting on top of another spot color takes on the proof. Onscreen, the colors may take on the general appearance desired by the CPC, but the printed output using ink pigments may take on a vastly different appearance, one that cannot be predicted with a proof without some significant pre-work from the printer and prepress provider.

#### EXPANDED GAMUT

When released into the world of flexography and adopted by major CPCs, expanded gamut became a total game changer for designers. It eliminated restrictions on the number of colors

that a package could have. It made overprinting colors a concern of the past. It alleviated worries over combination colors in printing. More importantly, it introduced a whole new series of design considerations and made it even more imperative that designers think like separators when creating new designs. To be effective, they must fundamentally understand that all spot colors will eventually break down into multi-channel separations.

One commonly overlooked mistake when designing for expanded gamut is having small, colored type or strokes in the file—generally, anything less than 12-point type or 2-point strokes. As that colored element gets refined in the workflow, it will process out into percentages of color in different separations. These separations become plates, and those plates will need to register on press. Type and small strokes become much more legible and clear when made from a single base color instead—a black or a blue, for example. It's best

to make all small type and strokes one of the base colors used in separating.

The human eye perceives color shifts more easily in large, flat areas of color than in patterned or textured areas. For this reason, the most effective expanded gamut jobs contain many different patterns or textured elements (checkerboards, stripes, rays, images, gradations, etc.), rather than flat color that, when refined, will separate into color overprints. Due to a number of different press complexities in flexography, these colors could vary across or around the web and show undesirable color shifts.

Designers and CPCs may resist expanded gamut initially because the systems cannot replicate perfect matches to established color systems like Pantone. There are too many factors in play that affect color reproduction: registration, substrate, printing sequence, lamination, etc. As a prepress

provider and printer, you should provide a solution that makes color prediction easier for the designer and CPC. Create swatch books of the different Pantone PMS and GOE colors processed through the expanded gamut system, and have these available to send to customers that want to implement this system. Designers can then pick from these books when selecting colors.

## CONCLUSIONS

Remember that communication between the printer, the prepress provider, the designer and the CPC is critical in order to successfully process work without error and consistently across a family of jobs. Before beginning any new project, the printer and prepress provider should ask themselves the following questions:

- Do the designer and the CPC have a basic understanding of flexography? If not, do I have information available

## RESPONSIBILITY

As packaging graphics continue to increase in complexity and production timelines continue to compress, the clear assignment of responsibilities is necessary to ensure a quality printed product in a timely manner. The assignment of responsibilities requires planning and collaboration among all involved parties.

- **Consumer Product Company (CPC):** Ultimately, the customer defines expectations and therefore, must drive the collaboration process. The customer determines the effort expended to reach satisfaction. The CPC must facilitate communication between the supply chain parties: designer, prepress provider and printer.
- **Designer / Production Design:** The designer must work with both the prepress provider and the printer to understand the capability of the printing/converting process being utilized. Based upon the print capability, the designer must provide a design concept that will enable the printer to meet the expectations of the customer (CPC). The earlier in the design development process the prepress provider and printer are involved, the better able the team is to determine specific capabilities and ensure the final product meets the customer's design objectives. Additionally, the designer is responsible for:
  - ♦ Establishing a basic color scheme and color palette before final files are sent to production.
  - ♦ Checking all copy for spelling and kerning.
  - ♦ Treating common elements and logos consistently in the layout.
  - ♦ Building all copy and vector-based elements in accordance with the specifications of the print provider.
- **Prepress Provider:** The prepress provider must work with the printer to understand the capability of the printing/converting process being utilized. The prepress provider supplies the designer with accurate and timely information regarding print capabilities at the beginning of the design phase to facilitate the creation of a printable design. Based upon the print capability, the prepress provider produces appropriate films/files/plates that will enable the printer to meet the expectations of the customer (CPC). They must document the controls that ensure the consistency and accuracy of the supplied media (films/files/plates). Additionally, the prepress provider produces a contract proof calibrated to accurately predict the printed result. The prepress provider must provide the printer the ability to objectively confirm the accuracy of the prepress work and the printing process. This can be accomplished through the use of agreed-upon control targets.
- **Printer:** The printer is responsible for consistently reproducing the graphic design to the satisfaction of the customer (CPC). They utilize and document the process controls necessary to ensure that accuracy and consistency are achieved. They work with the other parties and suppliers to define the capability of the printing process. The printer provides the designer with accurate and timely information regarding process capabilities at the beginning of the design phase to facilitate the creation of a printable design.



that I can send to them explaining some of the fundamental rules and considerations of flexography?

- Are the designer and the CPC aware of *FIRST*? Have they read it?
- Have I fingerprinted my press with the prepress provider to discern basic print specifications like minimum type sizes, minimum stroke weights, minimum dot percentages and optimal bar width reductions in barcodes? Have I provided these specifications to the designer?
- Is the die drawing clear enough that the designer should not produce a design that is not printable, due to the layout, or a design that will not fit on the finishing and packaging equipment?
- Do I have a list of design criteria, or a "do and don't" list, that I can submit to the designer explaining some of the additional design considerations for elements that may not print well?

If you can satisfactorily answer those questions, you will have a much higher chance that the Rembrandt the designer created won't come out resembling a macaroni noodle painting. ■

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