Designing for print

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In this tutorial, I describe some important details of my work as a manager of a prepress services and design studio. By sharing my experience, I hope to provide useful information to people who work in a publishing environment.

The four professionals in our studio have been working together for almost 13 years. During this time, we have applied various techniques to a wide range of documents and projects to prepare them for final printing. We receive about 70% of our project content from outside the studio, and we design the other 30% ourselves.

We work on two platforms, Windows and Mac. On each platform, we use the latest version of each software product that we need for our projects.

Starting a publishing project

Each publishing project begins with a meeting, at which the designer has to answer the following questions:

1   Do I have all text and pictures?

2   If I have all text and pictures, do I have permission to edit them? If I do not yet have all text and pictures, will I receive the additional material on time?

3   Is the text available in digital format? Will I receive it on time?

    All text destined for print must reside somewhere on a hard disk or CD. Of course, you must keep in mind the time constraints for the project.

4   Are the pictures digital?

    If the answer is yes, be careful. Approximately 40% of the digital pictures we receive are unusable for printing. Why? Most pictures come from digital cameras. Almost every digital picture is a JPG file with a resolution of 75 dpi in RGB colors. Such pictures are suitable for viewing on a monitor or TV, but they are totally unsuitable for printing. For more information, see "Handling of pictures" on page 8.

5   Is the design synchronized with the final printing process? Although this question is usually ignored, it is the most important one of all. Let's begin our discussion by addressing it.

Synchronizing the design with the final printing process

Printing a picture to a desktop color printer is completely different from printing the same picture to a big printing press. In printing to a big printing press, mostly four colors are used: cyan, magenta, yellow, and black. How can thousands of colors and tints be reproduced from these basic colors? Two processes — screening and color separation — make it possible. Screening is the process of converting a continuous-tone image to an image made up of tiny dots, which allows shading and color gradations to be reproduced. In the screening process, dots of different sizes are placed on a press template. Color separation is the process of creating a separate printing plate for each color of ink (cyan, magenta, yellow, or black) that an image requires. This is necessary because a printing press cannot apply more than one ink (color) at a time. Together, the separate plates produce the image.

Let us consider the following scenario: A circle is filled with a red radial gradient a red radial gradient with color tints ranging from 0% in the center to 40% on the border. It looks great on-screen and on a composite printer.
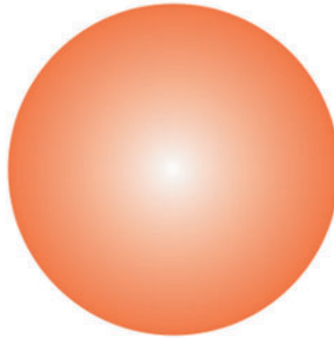
To prepare the circle with the red radial gradient fill for printing to a big printing press, we start by creating separations. The result is a yellow and magenta film with nice, smooth gradients.
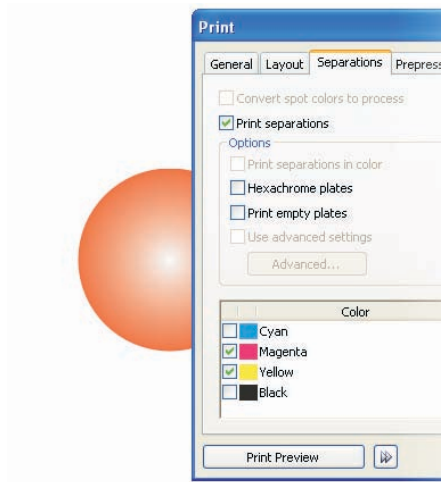
Preparing the color separations
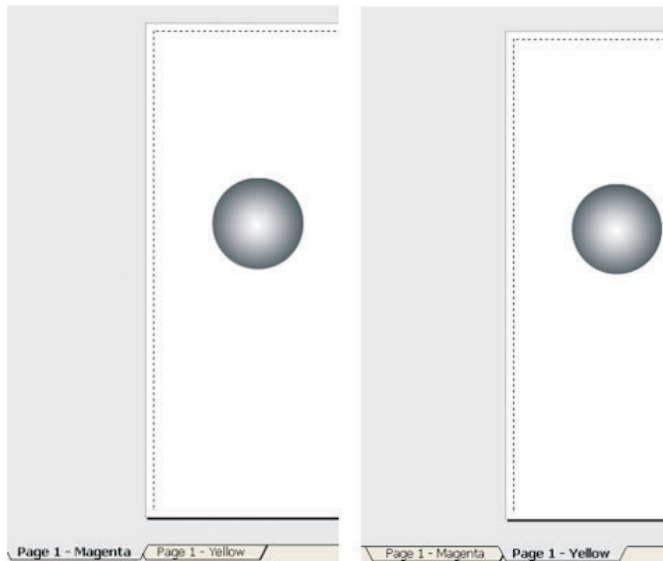
Previewing the color separations

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The second step is to prepare the printing plates. This is the most problematic step, and at this stage, we must know what the final printing process is — offset or flexography printing. With offset printing, there are only minor problems (if any) because the printing process is standardized and well-documented. In contrast, there are no standards in flexography printing (printing on a relief press), and there is no sufficient information available in books or on the Internet. Moreover, each press manufacturer follows his or her own standards. That is why, preparing good flexography printing plates, also known as clichés, can be challenging. The smallest possible dots on those flexo plates are 1% or 2%, depending on the water temperature, the light source quality of the developing device, the washing brushes, and so forth. So, dots on the film that are smaller than 1% are not included on the printing plate and therefore not printed.

Printing is the third and last step. In printing, we encounter the problem dot gain, which is an increase in the size of printed dots, caused by the spread of ink as it is absorbed by the paper. When the printed dots become larger, they cause images to appear darker than intended. With offset printing, the dot gain ranges from 10% to 12%, but with flexography printing, the dot gain ranges from 14% to 25%. In the example with the red circle, the 2% dots on the plate grow to 6%.

The printed result is a circle with a white ring in the middle, and a gradient that starts with a 6% tint, creating a hard edge of pink, and ends with a red border. Such printing problems are common for all objects with smooth color gradations such as gradients, blends, drop shadows, and bitmaps.
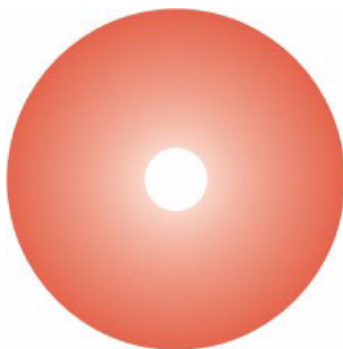
Let us consider another example: The publishing project is a full-color 90 × 130-mm label. The background is a white-to-green gradient. The foreground includes a photograph of the product, some black text, and a barcode.

The designer knows nothing about the final printing process and starts to design the label. The design is destined to fail from the very beginning. With flexography printing, dots smaller than 4% or 5% cannot be printed. Knowing that the labels will be printed on a relief press, the designer needs to change the background, because gradients that change from white to a color cannot be reproduced in flexography printing. To produce a smooth gradient, you must make sure that the lightest color tint is 4% or 5%, not 0%. All colors between 0% and 4% or5% are lost and therefore not printed.

The color above the line is lost because the color tint is less than 4%. The result is a hard, ugly border in the area of the 4% to 5% color tint.

These scenarios are true only in a conventional workflow, not within a computer-to-plate (CPT) environment. In a CTP setting, all problems connected with preparing films and printing plates are eliminated because the press plates are produced directly from the desktop publishing software, not from a film. However, the use of a CTP process in flexography printing has sporadic success.

The problems illustrated above show how important it is to know beforehand what the final printing process will be. Knowing during the design phase how a project will be printed, the designer can work to avoid such problems.

Handling of text

The most common mistakes in handling text occur when you replace fonts. When you need to change artistic or paragraph text (for example, when you need to change the fonts from Arial to Times), you can choose one of the following three methods:

- Select and change. (Select text with the **Pick** tool, and click **Text ▶ Edit text**.)
- Find and replace. (Click **Edit ▶ Find and replace ▶ Replace text**.)
- Mark and change. (Highlight the text by using the **Text** tool, and change the text.)

The third method is dangerous because the spaces are not always marked and changed. The result is a document that contains "ghost fonts." All spaces keep the original font characteristics, but you do not know this unless you look at the font list of the document. Another problem is that spaces can have a bigger font size applied, sometimes making alignment impossible.

Such font problems are not confined to the handling of text in CorelDRAW®. They can occur when you handle electronic text in any program. Let's look at the following example.

Using the **Text** tool, I typed some text in New Times Roman font, font size 12 points, and then copied the text below.

Next, I made the following changes:

- I marked "ABC" and changed the font to Arial and the font size to 8 points.
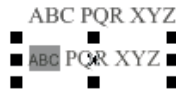
- I marked "PQR" and changed the font to Arial and the font size to 14 points.

- I marked "XYZ" and changed the font to Arial and the font size to 20 points.

- I marked the space between "C" and "P" and changed the font size to 60 points. The font is still New Times Roman, but you cannot tell the font by looking at the space.

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- I left the space between "R" and "X" unchanged.

That is how, with several small font changes, I managed to produce ugly-looking text.

Problems with text are often introduced when you paste black text in your project from other programs, such as Microsoft® Word. The imported black text is usually in the RGB color space. For text to appear as true black in the final output, you need to make sure that all black text is in the CMYK color space. If you want to apply CMYK black to black text imported in CorelDRAW, you need to enable the **Force CMYK black** check box in the **Importing/pasting text** dialog box. This check box is available when you choose an option that maintains text formatting.

Handling of pictures

With the boom of digital cameras in the last two years, the number of JPG files we've been receiving has increased immensely. JPG files present the following problems:

- A picture file is opened and saved many times before it is ready for final output, but each opening and saving of a JPG file means unrecoverable loss of quality. That is why when we receive JPG files, we first convert them to TIF or EPS files.
- The picture resolution for printing must be at least 300 dots per inch (dpi). The JPG files coming from a digital camera usually have a resolution of 75 dpi. To achieve a resolution of 300 dpi, which is needed for high-quality printing, a picture of 8×12 inches at 75 dpi needs to be reduced 16 times to a printed size of 2×3 inches.
- We have found that many JPG files are too small to be reduced in size and made suitable for printing. If you want to use pictures from a digital camera for printing, the JPG files should be at least 1600×1200 pixels.
  Most people think that the dpi value is an indication of quality, but the dpi value indicates only the numbers of pixels (dots) per inch in a picture. In other words, the dpi value indicates density. The only way to change the quality of an electronic

picture is to change the number of pixels, not the dpi. If your digital camera allows you to change the compression settings, you should specify the best quality option and the largest file size before taking pictures. Regardless of the settings, however, if your digital camera cannot accommodate at least 3 mega pixels, the pictures are probably not suitable for high-quality print work.

- JPG files use the RGB color space. Pictures for printing require the CMYK color space.

Luckily for us, most high-end cameras can store pictures in raw file formats. Raw camera files are unchanged and uncompressed, but they can take up a lot of space. We've had excellent results with raw camera files.

About the author

For the last 14 years, Gerard Linders and his wife have owned and run DTPRESCON (www.dtprescon.nl), a five-person company based in the small town of Waalwijk, in the southern Netherlands. The professionals at DTPRESCON prepare print jobs for offset, screen, and flexography printing, working on both Mac and Windows platforms. In addition, DTPRESCON is a fully equipped design studio, which feeds content for the company's prepress activities. In electronic publishing, DTPRESCON provides Internet access as well as content and hosting services.