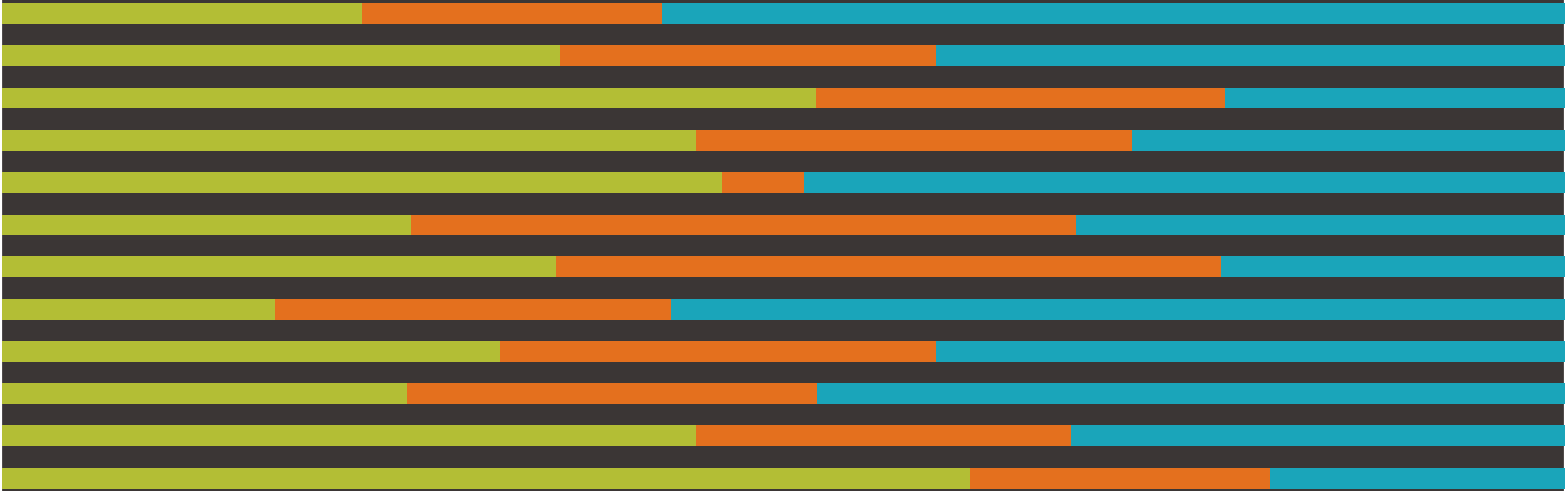


An introduction to print production

TeamClient Design Toolkit





Overview



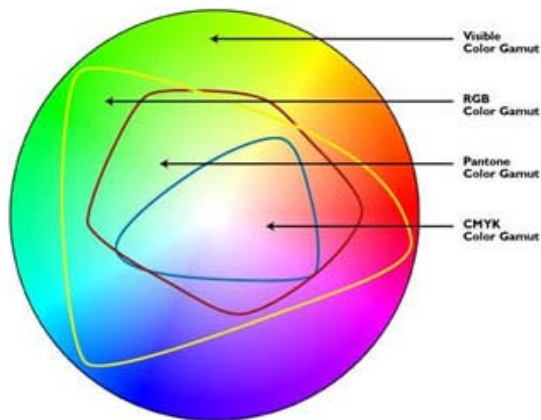
“What you see is not always what you get”

Truer words were never spoken when it comes to managing expectations for printed material.

The following presentation gives an overview of print realities, and sets out guidelines to help navigate the complex world of print.



Introduction to Colour

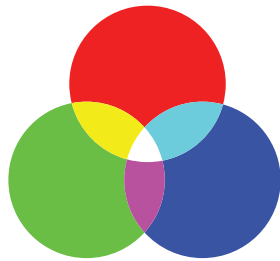


The human eye can detect millions of colours. No instrument or device invented can reproduce all of the colours the eye can see.

A computer monitor can display only a small percentage of these colours, and a printing press can reproduce fewer colours still.



Colour Models



RGB

Red, Green, Blue



Additive Colour used for computer displays.
Not reliable from one device to another.

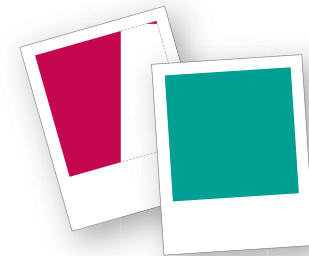


CMYK

Cyan, Magenta, Yellow, Black



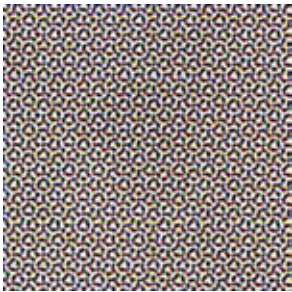
Universal Inks used for printed material.



PANTONE®



CMYK



close-up of CMYK dots

CMYK refers to the four ink colours used for most printing: **Cyan**, **Magenta**, **Yellow** and **Black** (or Key).

An image which is viewed on a computer screen is in RGB. In order to reproduce that same image using ink on paper, it must be converted to the CMYK colour mode. Certain vibrant blues and greens and rich reds in RGB are outside the gamut of CMYK.



A full colour image is separated into 4 printing plates, which, when combined, simulate the full colour spectrum.

CMYK is also referred to as “4-Colour Process” or “Process” colours.



Pantone®



PANTONE® or PMS refers to the Pantone Matching System, a proprietary colour system which uses ink formulas to achieve a specific, accurate colour across all print. These may also be tinted or screened to achieve a broader range of colour.

A brand is represented by an ownable colour which can be consistently and universally reproduced. This can best be achieved with this colour system. These colours would be used in addition to CMYK for a print run, so that a package might print with 6 colours (CMYK + 2 Pantones for the brand logo).

It is worth noting that many colours in the Pantone Matching System cannot be matched in CMYK, and are not accurately represented in RGB or on a colour output device.

PANTONES are also referred to as “Special” or “Spot” colours.



Print Methods

Packaging projects can involve an incredibly wide range of formats, substrates and print methods.

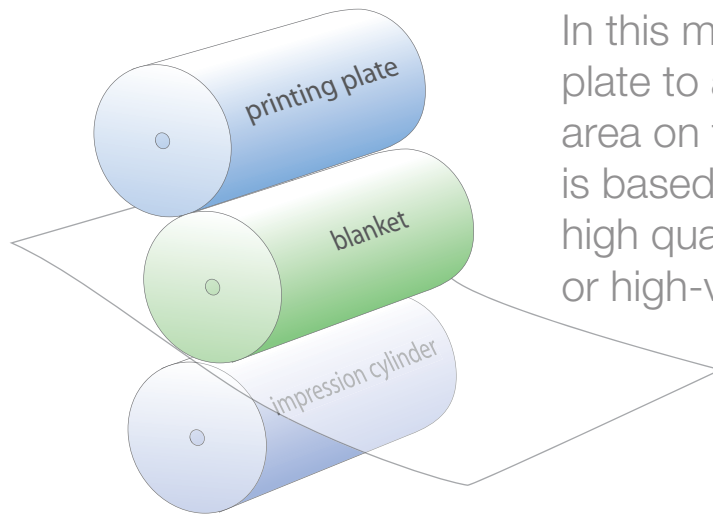
Offset (or Litho), Flexo and Gravure are the 3 most common print methods for packaging. Within these categories, there is a full spectrum of capabilities, equipment and (sometimes) limitations specific to each individual printer. For instance, although many Flexo printers have updated their presses and equipment, and there has been a vast improvement in quality in the last decade, there still remains a particular set of specifications for each individual printer.

It is strongly advised that there be contact with the printer as early as possible in the design process to ensure the highest quality and to minimize “headaches” as the project moves into print production.



Print Methods: Offset

Offset or Offset Lithography is the most common print method in the print industry. There are two types: sheetfed and web offset. For packaging, sheetfed is used primarily in the paper label and folding carton segment. Web Offset is typically used for newspapers, magazines and catalogues.



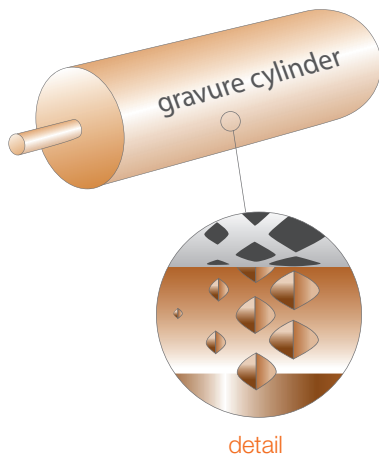
In this method, graphics are transferred – or offset from a printing plate to a rubber blanket, and then to the substrate. The image area on the plate is neither raised nor etched into the surface – but is based on oil and water repelling each other. Printing is of a very high quality and consistency, and it can be used for small, medium or high-volume jobs.





Print Methods: Gravure

Gravure printing is the highest quality print method with excellent design reproduction and the best range of density from light to dark. It is often used in the flexible packaging industry for labels and packaging printed on paper, plastic or foil.



In this method, cylinders are used and cells or small recesses which carry the ink are engraved or etched into the surface. The ink is then transferred directly onto the substrate. One advantage of Gravure is the consistent high quality over large print runs, as the cylinders can make a large number of impressions without degrading. Drawbacks include the cost required for cylinders over plates, and the lead time can be weeks instead of days. Gravure is usually not cost effective for short runs, and changeability is also an issue.





Print Methods: Flexo

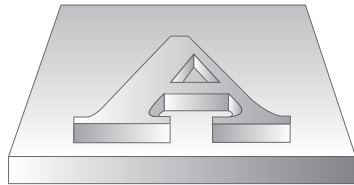
Flexo or Flexography is the most common method of printing packaging, as it can be used for many types of substrates including: corrugated cartons, milk and beverage cartons, labels, and plastic bags and wraps (polyethylene, polystyrene, cellophane, vinyl). It is rarely sheetfed (except for corrugated cartons) and material is fed into the press on rolls. It has a quick setup and shorter runs are feasible with acceptable to good image quality.

It is definitely the most challenging print method, and some characteristics and limitations will be outlined on the following pages.



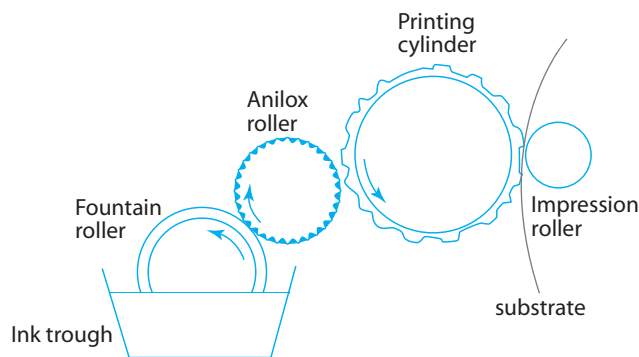


Print Methods: Flexo



In the most basic terms, Flexo could be described as a “rubber stamp” method of printing, where the image is raised on the surface of the plate, which accepts ink from a roller.

The inked roller called an anilox roller applies ink to the raised portions of the plate, which is transferred to the substrate. The anilox roller is engraved with a controlled size and number of cells which carry a specific amount of ink.



It is important to realize that within the Flexo industry, there is a wide range of equipment and capabilities. Older presses may not be able to achieve the same results as many newer presses. A package design studio will need specifications for number of colours, trapping and registration information, minimum line width and minimum type size (positive and reverse) from the printer at the earliest opportunity to manage the job through the studio.



Print Methods: Flexo

SOLID

Solids and Screens: If a printer indicates that 6 colours are available for a packaging job, a single printing plate would be needed for each colour. Flexo, however, does not handle solids and screens in the same way. More pressure is needed to achieve a dense, heavy solid, and because the anilox roller would be engraved with this in mind – holding a light screen on the same roller might not be possible. Designers need to keep this in mind when designing for Flexo. Additional stations to separate screens and solids of the same colour could complicate a job, and should be discussed with the printer.

Gradations: It is not possible to achieve a minimum dot with Flexo, so vignettes and gradations will have a harder edge than with other printing methods (which can achieve a soft, feathered edge).

Trapping and Registration: Trapping is the process of adding a slight overlap between adjacent areas of colour to avoid gaps caused by registration issues. By the nature of the flexible materials being printed and the larger presses, this trapping may be much more noticeable with Flexo.

offset

flexo



Print Methods: Flexo

**sans serif
type**

serif type
%

Type and Detail: It can be difficult to achieve fine detail and to hold small type with Flexo. A bold, sans serif font is always best. The fine serifs or strokes on letters can be challenging to hold, and may disappear altogether from the printed material. The printer or prepress should provide minimum type size (ie. 6 point for positive / 8 point for reverse) as well as minimum line weight for graphics. Reverse or white type can be a particular challenge, if printing on a background made up of more than one colour (ie. 60% Magenta/80% Yellow), and may need a keyline around to hold it.

White Backup: If printing on a clear substrate, in order to achieve the full impact of the graphics, a white will print behind all of the other colours. This white ink is not as opaque and bright as the white stock on which colour swatches are printed. It can often have a “grey” tone. Colours will never look as bright and saturated in this case.



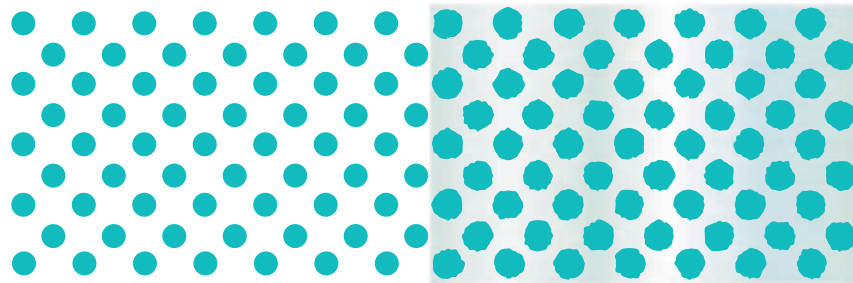
Print Challenges: Substrate



For most commercial printing, be it corporate material, direct mail or magazines – a bright, white paper stock will suffice. For packaging, the sheer number and types of substrates being printed is dizzying. These include carton stock (matte, recycled, corrugate), clear film, metallized film, foil, cans and plastic. Each of these surfaces will affect the ink colour and print quality. It is important to manage expectations, and to realize that colour swatches printed on a bright, white stock will not look the same printed on a clear poly bag or a recycled carton. In general, it is always a good idea to have the printer provide ink drawdowns on the substrate before proceeding with printing.



Print Challenges: Dot Gain



Dot Gain can be defined as the increase in diameter of a halftone dot from an original to a printed piece. Many factors can influence dot gain, including press settings, inks and paper stocks. Dot gain is more pronounced on an uncoated stock such as newsprint. It shows the greatest increase in midtones between 40-60%. Printers should be aware of their presses and the likely dot gain percentage, and curves applied at the prepress stage should be able to compensate for this. It will always be a factor in printing, but with the right steps taken in advance, it can be minimized.



Press Check

Check List:

- Establish communication with the printer early on in the project
- Discuss specs, budgets, expectations and timing
- Share the vision of the piece, the desired impact
- Review any special enhancements or techniques which may be available.
- Let the printer know if you are open to options which may enhance the printed piece.
- Communicate your expectations. Are there specific areas or brand colours which must be matched?
- Bring all supporting materials, including colour proofs and any other colour targets or sign-offs





Press Approval

The environment in which colour is viewed can change it dramatically. When checking colour, ensure that you are in a colour balanced and controlled area.

For the first sheet, step back to get an overall impression of how it looks. Compare the sheet to your colour proof and understand where compromise might be necessary. If you are unsure of terminology, offer general rather than specific comments such as “less red”. Let the press operator determine what to do to get there.

Number press sheets consecutively with the changes made. If Pantones[®] are being used, check against colour chip. Check for registration issues and any marks or hickeys. If coatings are being applied, check registration and application.





Press Approval

Subsequent Sheets

Mark sheet No. 1 and number all subsequent sheets to track your changes. Look at print quality – evaluating overall colour and balance, flesh tones, and type (edges should be crisp, there should be no broken type and knockouts should be clean). Prominently circle any areas of concern. Draw a line out to the white area of the sheet so your comments are clearly visible.

Continue to mark sheets in numerical sequence. Double-check previous adjustments. Check tints – with each colour adjustment they may have shifted. Fold sheets to review side-by-side, if necessary. Finally, ensure that any changes made have not impacted other critical areas.

When you are satisfied – sign off! Ask for the desired number of press sheets to take with you.

