Color

Color

- Gamuts
- Spot colors
- RGB (digital printing)
- Offset: CMYK, PMS(spot)
- Applications:
- registration
- swatches

Gamuts

The entire range of colors available on a particular device such as a monitor or printer.

What the eye sees

CMYK and RGB

Camera RGB

Scanner RGB

Monitor RGB

Desktop printer

Commercial printer

Gamuts

A color space comparison
3 minute video
https://www.youtube.com/watch?v=PjNe0IhfGV8
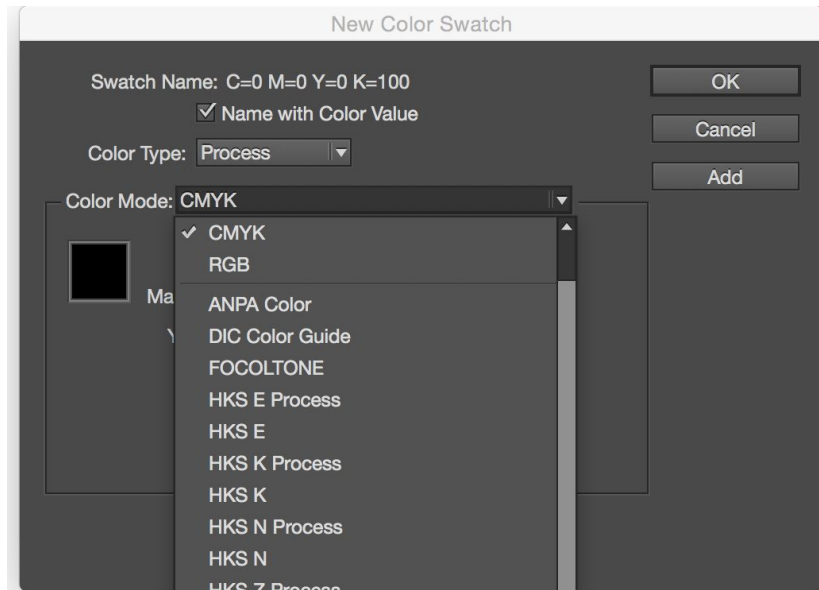
Digital Color

When designing for the screen or consumer digital printers, RGB best matches the color space of the output device. Higher end digital printing successfully mimics the CMYK space.

Digital Color

Sometimes workflow doesn't allow time for converting all of your artwork to another color space.

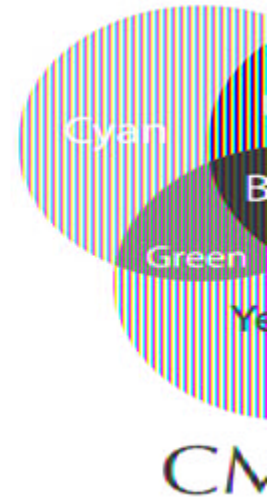Here is an advanced article and tutorial that suggests when you can bypass these practices:

http://indesignsecrets.com/import-rgb-images-indesign-convert-cmyk-export.php
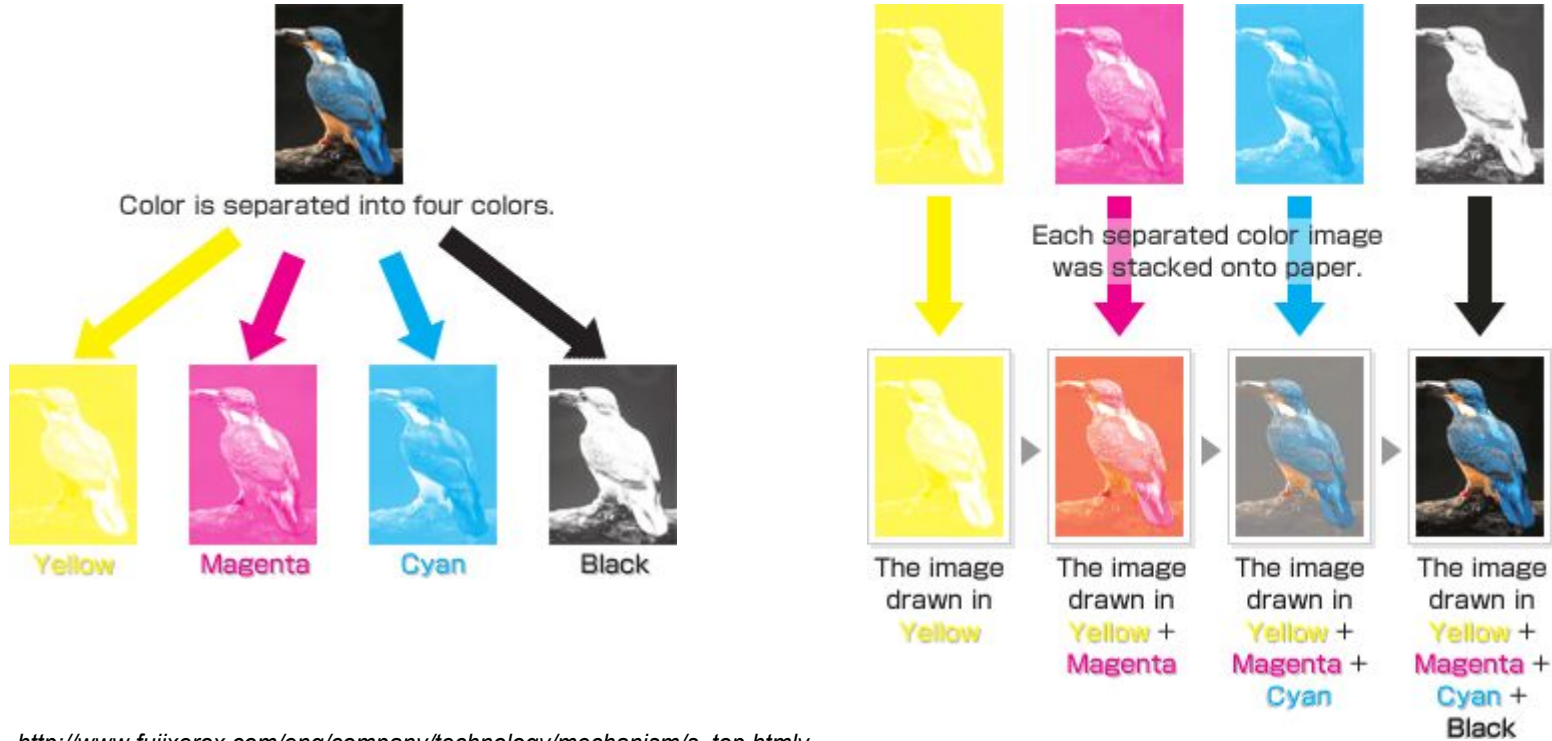
RGB v CMYK

RGB Additive Color Mixing
- transmitted light
- expressed in 3 values of 0 to 255
- Black: R=0 G=0 B=0
- White: R=255 G=255 B=255

CMYK Subtractive Color Mixing
- reflected light
- expressed in 4 values of 0 to 100
- K=Black (originally for keyplate, which the other colors are registered.
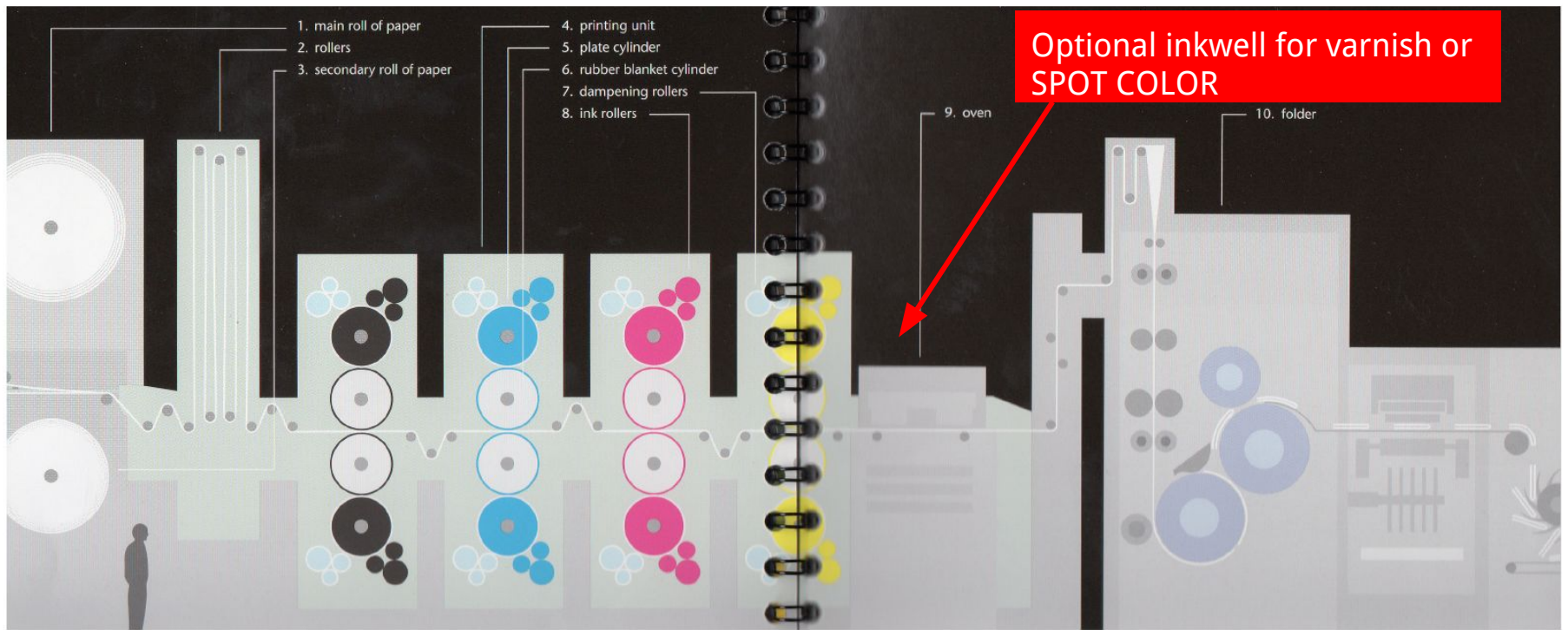- Black: C=0 M=0 Y=0 K=100
- White: C=0 M=0 Y=0 K=0

CMYK

CMYK

Printed plates appear in black to show
the density for that color.

1. main roll of paper
2. rollers
3. secondary roll of paper
4. printing unit
5. plate cylinder
6. rubber blanket cylinder
7. dampening rollers
8. ink rollers
9. oven
10. folder

Optional inkwell for varnish or SPOT COLOR

- speeds range from 15,000 to 50,000 impressions per hour

- usually "blanket-to-blanket", paper runs between 2 blanket cylinders, both sides are printed simultaneously

  most offset web fed presses print 4 colors on both sides of the presses

  used to print magazines, books, catalogs, newspapers

Rich Black

Because the CMYK color gamut is limited, we sometimes use a 'build' to create a richer black.

When wouldn't you use a rich black?

RICH BLACK
CMYK: 60 / 40 / 40 / 100

100% K BLACK
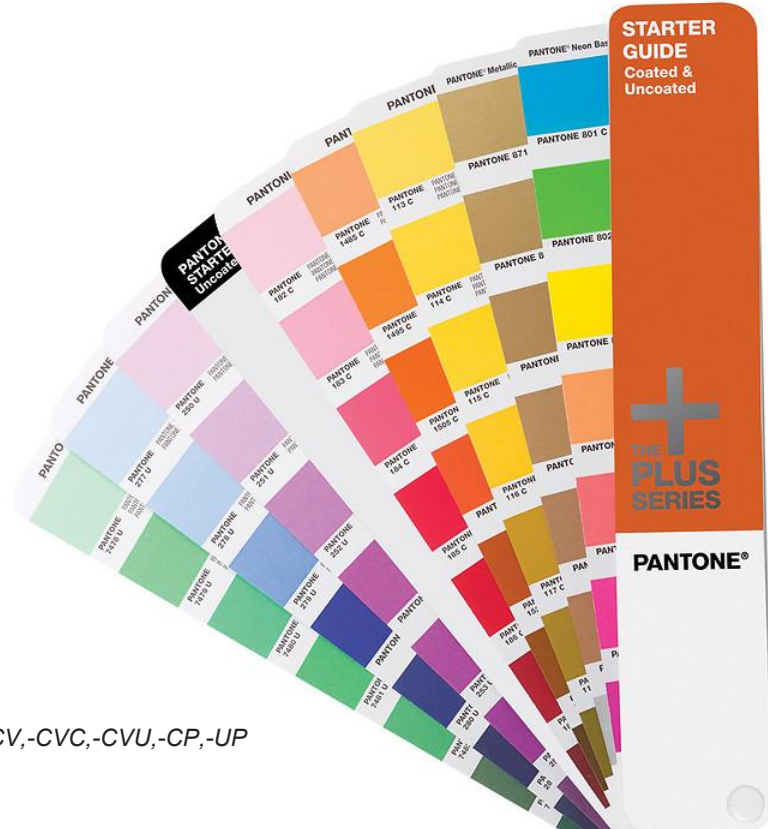CMYK: 0 / 0 / 0 / 100

Rich Black

Good for a 'flood color' area.

Bad for registering small type. (Requires that each plate be very tightly locked for the duration of the run). Better to stick with 100% black.

RICH BLACK
CMYK: 60 / 40 / 40 / 100

100% K BLACK
CMYK: 0 / 0 / 0 / 100

Pantone Matching System (PMS)
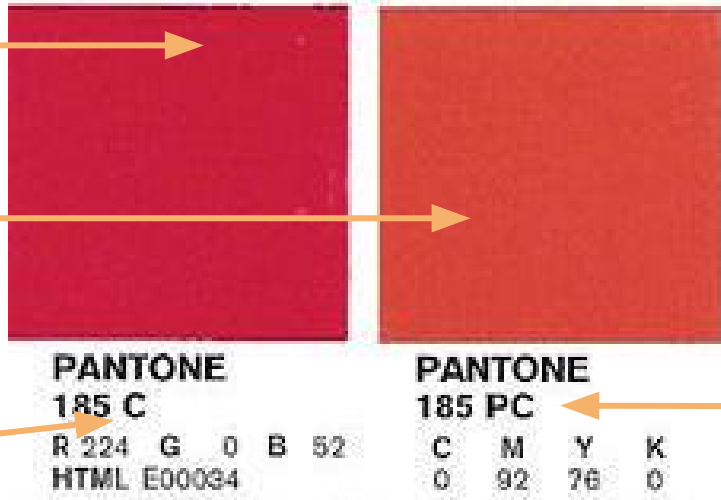
Why use PMS colors?

A complete list of Pantone suffixes:
http://www.pantone.com/help/?t=PANTONE-Color-Suffix-differences:-C,-CV,-CVC,-CVU,-CP,-UP

Reading a swatch

Color comparison
between PMS 185 ink and
a CMYK "build" of the ink.

C: Coated paper

PANTONE
185 C
R 224   G   0   B   52
HTML E00034

PANTONE
185 PC
C   M   Y   K
0   92   76   0

PC: "Process
Simulation"
of PMS 185

a CMYK build of 0/92/76/0
for the printer to mix ink

Spot Color

SPOT COLOR = Done in one pass.

BOTH SPOT COLORS:
- Pantone 185
- Mixed in one inkwell: 0/92/76/0

PANTONE
185 C
R 224   G   0   B   52
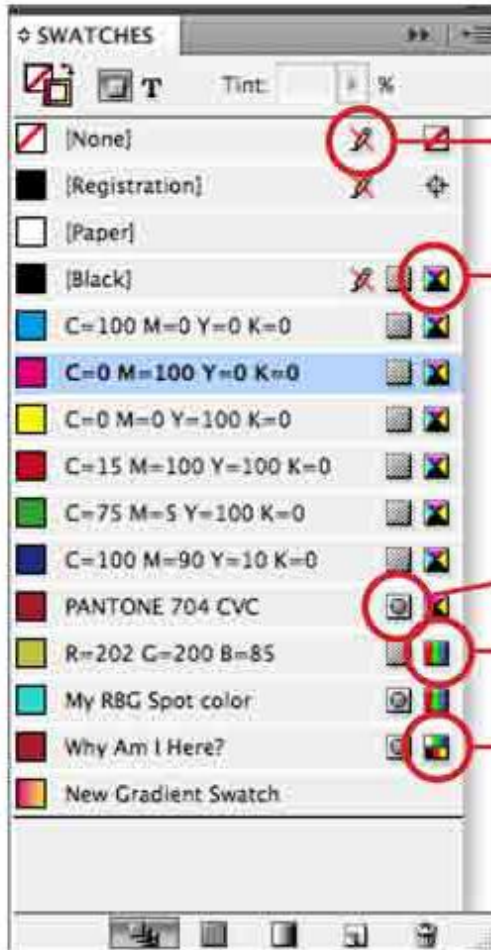HTML E00034

PANTONE
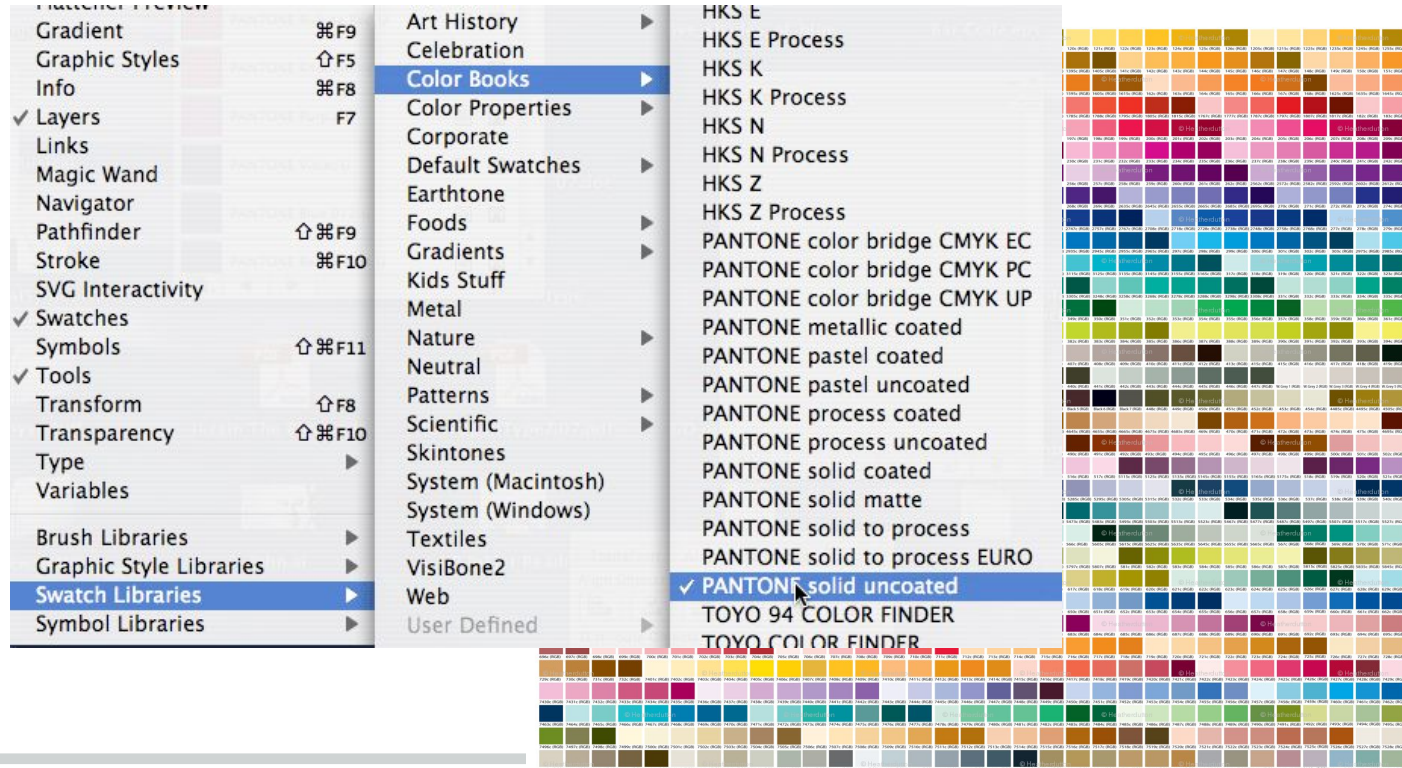185 PC
C   M   Y   K
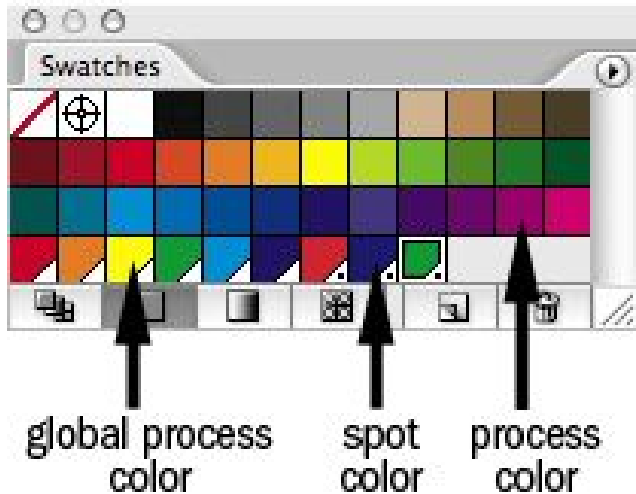0   92   76   0

Color: application

Swatches

- Express swatch names by their inherent color name.
  Avoid nicknaming.

- When converting a PMS color to CMYK, it is best to change the name to color value.

- Double-check colors match names and spaces when cleaning up swatches/unused colors.

Swatches panel showing:
- [None] — Cannot be edited
- [Registration]
- [Paper]
- [Black] — 4-color process or CMYK icon
- C=100 M=0 Y=0 K=0
- C=0 M=100 Y=0 K=0
- C=0 M=0 Y=100 K=0
- C=15 M=100 Y=100 K=0
- C=75 M=5 Y=100 K=0
- C=100 M=90 Y=10 K=0
- PANTONE 704 CVC — Spot color icon
- R=202 G=200 B=85 — RGB icon
- My RBG Spot color
- Why Am I Here? — LAB icon
- New Gradient Swatch

PMS - Adobe Illustrator

PMS - Adobe Illustrator


global process color

spot color

process color

if you apply the same global color to many objects in your Illustrator document, then you decide you want to change the color, it only takes a click or two to update all the objects. You simply alter the global color to your liking, and everything on the page updates

Registration

Shows up as 100% on each plate.

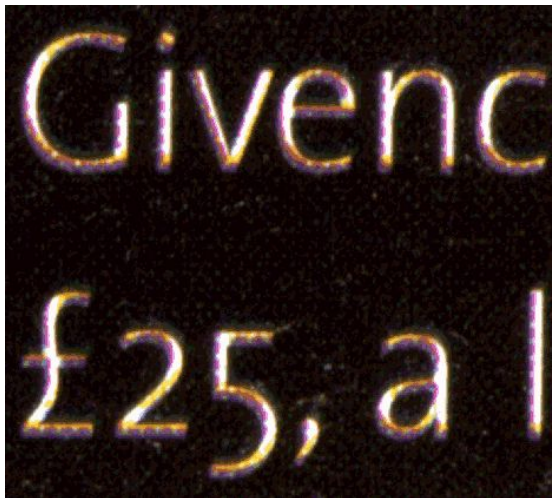**What needs to show up on each plate?**
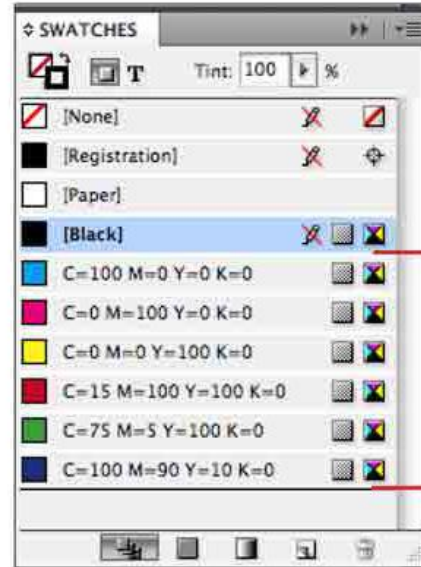
The default Swatches palette

An initial sampling of CMYK colors. You can edit or delete these and start creating your own palette if desired.

Misregistration/trapping

Misregistration with no trap (left) and with trap (right)

The type was set in 9-point and reversed out of a very dark photographic background. Bad registration has caused the dots in all colors to slightly overlap the character forms, making only small parts of them truly white. At real size on the printed page, you can't see the precise details of this color creep—all you can see is type that looks underexposed, filled-in, and blurry, with some characters almost illegible.

Trapping to avoid misregistration

Trapping allows a certain overlapping tolerance where two colors meet.

It usually involves expanding the lighter of the two colors to overlap into the darker colour, which should hold the overall shape of the image or text. Sometimes, gaps are left to prevent two colours mixing.
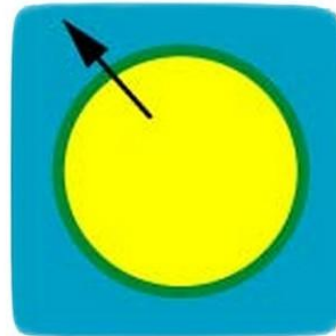
Designers may build traps into their complex file designs and most up-to-date reprographic software traps by default.

Most printers are always on the lookout for instances where this will be a problem, and have robust trapping software to manage it.

Choke:

The yellow square makes the cyan circle in the middle smaller

Spread:

The yellow circle becomes bigger

Centerline:

Both Spread and Choke are applied (rarely used)

Tips to avoid misregistration

1. Avoid abutting colors with a very small margin of space (ie. two thin colored rules or box edges next to one another)

2. When using process colors you can sometimes avoid the need to trap by making sure that adjacent colors share a certain percentage of color.

3. Sometimes it is advised when building a flood color, to use at least 3 of the 4 plates to insure you get a solid density fill.

4. Avoid using small type (especially of a color build) on another flood of color.

http://graphicdesign.spokanefalls.edu/tutorials/tech/trapping/trapping.htm

Deleting Unused Swatches

- Good for other users of the document,
  or if you want to build other collateral pieces,
  you don't have to sort through hundreds of colors.

- Best practice for offset printing so as to not generate
  unnecessary plates.

https://www.youtube.com/watch?v=gHZ59HrxFFY
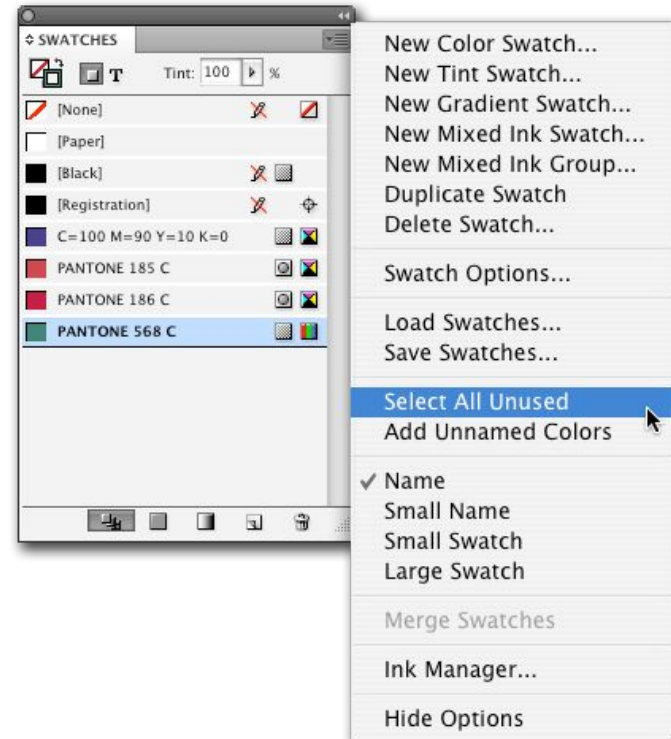
Split Fountain (spot color)

Typically done on screenprinting/letterpress, split fountain ink simply adds two inks to one well. The results are one of a kind color gradients as the inks shift. Most offset printers are not able to achieve this technique.
http://www.andrewkeir.com/split-fountain-printing/