

Printing made easy

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The Big Picture

To print comfortably, you need 3 things. First is trust that you are seeing the colors in your file accurately, second is to trust your are printing the colors accurately and third is a printer & media that are functioning correctly. If you had this, and your prints change, you know its one of those three things. Thats it. Monitor calibrated, check. Proper printer settings & profile, check. All nozzles firing and paper loaded right? check. This is the big secret, the “closed loop”, the magic sauce for printing. Pencils down.

Understanding the players

- Color Mode

- sRGB - S is for Standard, but I refer to it as “small”. This is the format used to make things appear the same on your phone, tv, projector and monitor. This format clips color in the light tones, It yellow, red, blue. etc, by at least half. Avoid this please.
- Adobe RGB 1998 is the mode for most of us who send out or print their files at home. Check your camera for this mode to capture jpg’s and tifs. or shoot raw and assign it.
- Pro Photo is the largest color space, but only the 11 color Epson Hexachrome printers can take advantage of this. So the one which include orange and green. 4900/7900/9900 or now the new Sure Color 5000/7000 & 9000.

- Resolution

- Don’t assume pixels in your file are equal to the dots required on the printer to recreate them. You have 4 to 11 inks mixing it up to make 256 colors in your file. Math is required to get there
- All printers use a mathematical algorithm to simulate continuous tone called dithering. Optimizing the resolution in your photo application saves the driver from figuring out what dots to throw away. This is one of those TRUST ME moments gleaned from the engineers who design these printers.

- HP & Canon - aim for 150 ppi at full size. These printers use a 4:1 ratio for recreating your image. $600 \text{ dpi} / 4 = 150 \text{ ppi}$. Double if printing at 1200dpi
- Epson - aim for 180 ppi at full size. Epson has a 8:1 ratio, so $1440 \text{ dpi} / 8 = 180 \text{ ppi}$, Epson printers work in increments of 90, so 180, 270 & 360 Print at 2880?, go for 360 ppi

- File formats

- Short answer, shoot in raw, save as tif, avoid jpg's. Use png's instead of jpg's or gif's for email, web & thumbnails. Jpg files loose data (color tonality) to compress which can not be recovered. PNG files do not sacrifice color and recover compressed data on reopening. TIF files can be saved with LZW compression without sacrificing color to save space, typically by 50%.
- 8 bit is still the norm when printing, even though some drivers support 16 bit, they convert to 8 when actually printing.

Color management

- Start by making sure your file has a profile assigned to it. This is the color space ie Adobe RGB or ProPhoto. Check by going to Image/Color Settings/Convert to Profile. Look at the RGB mode. When printing you will see this again under Color Management/Document Space
- The colors in your file are translated to your monitor and your printer through individual calibration. Monitor calibration insures you are seeing the colors in your file accurately. Printer calibration is specific for each paper you use, so an ink and media combo and insures you are printing these colors accurately. These are called ICC profiles and can be made by you with a tool or downloaded from a paper mfg. Most if not all photo printers include and install these when setup.
- Profiles can be previewed or "soft proofed" in Photoshop by going to view-proof colors-custom-then choose the profile ie Epson P800 poem Luster 1440. Technically each print resolution can have its own profile, but most dont go there.
- Gamut warning will show you what colors the printer profile will struggle with. In Photoshop, go to View/Gamut warning to check it after you have selected the printer profile

- Correction tools

- Not enough room to go over all the tools but my two favorite are Levels and replace color in Photoshop. There are many plug ins now that automate image correction that show up in your filters menu. A page is included with links for both Photoshop and Lightroom

- **Printing**

- Short answer, the best method is under Color Handling/Let Application determine colors ie Photoshop or Lightroom, then under Color Management,/Document Profile insure the assigned profile shows up (Adobe RGB 1998). Under Destination or Printer Profile pick where the image is going and on the paper you are using ie Epson P800 Photo Luster.

- **Lighting**

- Lighting has a noticeable effect on your image so keep that in mind when printing and correcting. A professional viewing station or light is ideal, but taking the print outside is a good alternative. If printing for your own enjoyment, and you know where its going to lie, take it there to check it.