

# Black-Ink-Only Monochrome Printing

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*I work primarily in color, printing my images on an Epson 1280 (dye ink) inkjet printer. Occasionally I have a black & white print to make, but I don't do it often enough to justify a dedicated system such as "quad black." So I needed a method to produce acceptable monochrome prints with the 1280 printer.*

## **Printing monochrome with color inks**

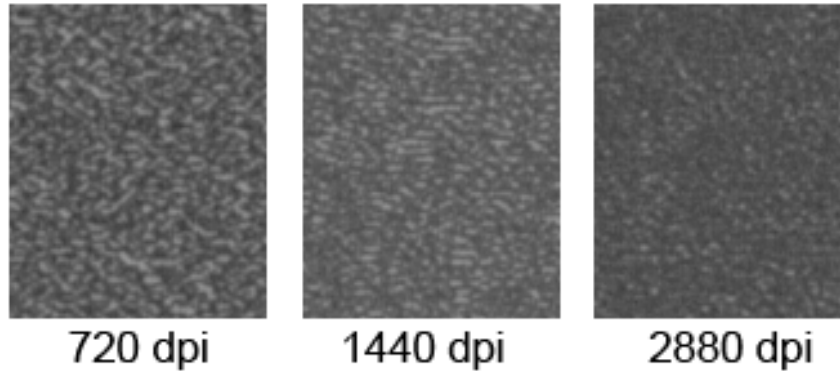
The conventional wisdom is to print monochrome images in color to obtain smoother tonal gradations. While this may be true, it is extremely difficult to balance the printer (through print driver adjustments, compensating curves, or custom ICC profiles) to produce neutral tracking through the entire gray scale. Inevitably there are color casts in certain tonal ranges. To make matters worse there may be different color casts at different ranges in the same print, and prints may take on different color casts under different lighting conditions (i.e., they exhibit metamerism.)

One way to combat this is to create a gray scale image with the desired tonality, contrast, etc. but leave it in full-color RGB mode. Then add a color tone to emulate sepia or blue or some other toner reminiscent of the chemical darkroom. For many images this is not only a very attractive presentation, but the tone tends to mask problems with neutral gray scale tracking (although metamerism may be a problem.) There are times, however, when a neutral grayscale print is needed

## **Printing monochrome using only black ink**

I use Epson OEM inks, and primarily Epson papers. With this as my standard setup, I needed either to print in full RGB mode (with the above-mentioned color cast problems) or to print using only black ink. After some experimentation, I have arrived at a monochrome workflow that produces very attractive prints. Since only black ink is used, there is no problem with color casts. The tonality changes very little under differing light sources.

The key to this method is to print at 2880 dpi. The extra dot density minimizes the “grainy” appearance normally associated with black-only printing. This problem is most apparent in the darker tone values where a lot of ink is being laid down. To illustrate the effect of printing resolution, I printed a 33% brightness gray patch (representing a tonal level 2 stops below middle gray, equivalent RGB value of 85,85,85) at printing resolutions of 720, 1440, and 2880 dpi. The differences should be apparent in these samples that were scanned from the test print. The 2880 dpi sample on the right is clearly smoother than the other two.



Notes:

1. These samples have been enlarged to show the dot patterns. Actual prints show less graininess.
2. Printing this document on a laser printer appears to distort the apparent graininess of these samples. The on-screen version provides a reasonable approximation of actual results.

### **The black-only workflow**

What follows is the workflow I have established for monochrome prints. I normally begin with a grayscale file with Dot Gain 20% as the profile, although I have found that this does not seem to make much difference. I have successfully printed “grayscale” prints from RGB files with the Adobe RGB profile.

The process requires setting first the color management parameters, then the characteristics of the printer driver. I have used Photoshop 7 and CS with an Epson 1280 printer under Windows XP Professional. My description will be based on these, but it should be straightforward to translate the required steps to other imaging software and printers.

In Photoshop, choose Print with Preview:

Set the source space to Document.

Set the print space to:

Profile: Dot Gain 30%

Intent: Perceptual with black point compensation

Then click Print to bring up the printer driver.

In the printer driver:

- Use Custom mode, Advanced
- No Color Adjustment
- Media type: Photo Quality Glossy Film
- Print quality: 2880 dpi
- Color controls, gamma 2.2
- Black ink only

The Epson printer driver only allows 2880 dpi printing on some papers. For the Heavyweight Mat (S041257) paper that I prefer, 1440 dpi is the maximum allowed resolution. To circumvent this problem, set the paper type to Photo Quality Glossy Film which does allow 2880 dpi.

Using this workflow, I have been very successful with Epson's Heavyweight Mat paper. An attempt to use Epson ColorLife paper for its semigloss surface was less successful. This paper did not accept the heavy deposit of black ink well. It showed considerable "bronzing" effect where the ink appeared to remain on the surface of the paper. Surprisingly, there was also a slight color cast problem. Black areas seemed slight reddish, while midtones had a slight green tint. The reason for this is not known, as examination with a 10x loupe revealed no evidence of colored inks.