

Inkjet Printing Black & White: A Primer



While there are no inkjet papers specifically designed for black and white printing, some are better able than others at reproducing grayscale images. This article will discuss what you should look for in a paper and other factors important in B&W printing.

There are a number of variables at play in the black & white workflow. Aside from paper, we'll cover image conversion and inkjet printers. These aspects are at least as important to consider as the paper you will use.

The Paper

The choice of paper for black & white printing is subjective and personal. While there are guidelines for what "looks good" with grayscales, in the end the choice depends on your likes and needs.

Here are three important factors to keep in mind and test before deciding on a paper:

The Ability to Reproduce Tonal Transitions

Reproducing the black and white parts of an image is easy compared to reproducing the many shades of gray in between. Some papers handle these fine transitions between black and white better than others. You should conduct tests to see which papers on your printer are able to handle transitions well. A paper seller should know which to recommend, but in reality you have to try it with your particular system. This is where a test chart comes in handy.

A number of these charts come with Quad Tone Rip (QTR) – a specialty black & white printing program. You can download this program and the charts at no charge.

(See resources section for more)

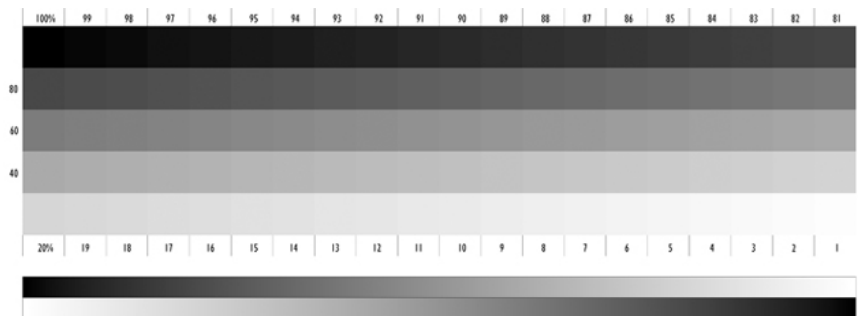


Image courtesy Roy Harrington / QTR

dMax

dMax is the maximum density, i.e., the deepest black a paper and ink combination can produce. In general, the higher the dMax value the better. A dMax = 2.0 is considered excellent and approaches that of traditional photo processing materials.

Your goal should be to exceed a dMax of 1.6 for matte/art papers and 2.0 for glossy/satin papers to

achieve best all around quality under different display conditions.

Glossy and satin inkjet papers have the best dMax potential. However, display conditions can affect the perceived depth of blacks in your image. For example, a glossy print under glass can have more reflection than a matte print. This might cause a perceived loss of black density. It is important to take this into account when choosing a paper.

Base Tonality of the Paper

Inkjet papers can be classified as either warm or cool tone. Cool denotes more blue cast and warm papers are yellowish. All paper is warm tone until chemical brighteners and whiteners are added to make them bluer, which the human eye perceives as bright white.

Some guidelines:

Cool Papers

Matte, glossy, and satin papers are generally cool tone and considered bright white.

Examples:

Red River Polar Matte
Red River Arctic Polar Satin
Red River UltraPro Gloss

Warm Papers

Cotton fine art paper and some other products are warm toned because they lack optical brighteners (OBAs).

Examples:

Red River Aurora Fine Art Natural
Red River UltraPro Satin
Red River GreenPix Warm Tone

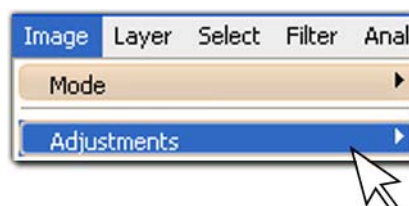
The bottom line: For black and white printing the base tone of your paper makes a visible difference. Consider your subject, your needs and likes, and then try different tone papers to see what works best.

Image Conversion

Properly converting your images to grayscale is important. Giving your printer the proper format to work with is key. Remember that inkjet printers are RGB devices – this means they take RGB data and convert it to CMYK during the print process. So even though you are creating a B&W image, the data still needs to be in RGB mode. This applies to any inkjet printer including those that have factory-designed black and white printing systems. (see below)

Photoshop

Photoshop is usually the tool of choice for such conversions. There are many ways to go about the process, but here are a few of the best methods.



- » Channel Mixer (Image > Adjustments > Channel Mixer) set to Monochrome allows you to customize the mix of channels. [Online tutorial here](#)
- » Use the Channel Mixer and Hue/Saturation or Selective Color as adjustment layers. You can modify color values before conversion. This allows selective grayscale conversion based on hue preference. [Online tutorial here](#)
- » Use RAW image software settings for a variety of black and white conversions. [Online tutorial here](#)
- » Use the Desaturate function or move the Saturation slider all the way to the left. This removes color from your image but you will not have detailed control over the process.
- » Try Russell Brown's black & white conversion actions for Photoshop [here](#) and help [video](#)

Outside Programs

Other programs such as Apple Aperture, Adobe Lightroom, and Nik Silver Efex Pro (Photoshop plug-in) all allow for black & white conversions.

Your Inkjet Printer

Your inkjet printer plays a critical role in the process. For many years inkjet users struggled to achieve a neutral tone black & white. The reason was simple but not well explained by printer manufacturers. The printers were designed with accurate and saturated color reproduction in mind. Black and white was either an afterthought or not considered at all. With non-specialized printers you have two choices:

1) Print a grayscale with all the colors turned on

This usually yields a B&W print with a green or magenta cast. The reason – your printer tries to make a neutral grayscale by mixing a bunch of COLORS without a proper set of instructions.

2) Print using the single black ink only

This usually makes a neutral toned image, but with substantially lowered resolution.

Introducing the Advanced Black and White Printers

Epson was the first to offer a machine with a dedicated B&W print system on board. The “Advanced Black & White” system featured three black inks* working in concert to create truly neutral or toned grayscale images. Canon and HP now offer similar systems. For you, this means stunning B&W images are possible on many different paper surfaces. Results are consistent and can be easily replicated from print job to print job.

* These systems actually add a splash of color ink in the mix to insure the right tonality. It is automated and generally out of our control. Total user control requires specialized software or 3rd party inks (see below)

A listing of all current inkjet printers with B&W systems on board:

Epson R2400, R2880, 3800, 4800, 4880, 7800, 7880, 7900, 9900, 10800, 11880



Canon Pro9500, ipf5000, ipf8000, ipf5100, ipf6100, ipf6200, ipf8100



HP B9180, B8850, Z3200, Z2100, Z3100, Z6100, Z8200



B&W Specific Inks

For those looking for more control or more adventure, adding 3rd party black & white ink systems to your printer is a choice. These systems feature between 4 and 8 different black density inks, and offer a broad tonal range. The Yahoo! groups below are a good starting point.

Recommended Papers for Black & White Printing

Cool Papers

- [Red River Polar Matte](#)
- [Red River Arctic Polar Satin](#)
- [Red River UltraPro Gloss](#)
- [Aurora Fine Art White](#)

Warm Papers

- [Red River Aurora Fine Art Natural](#)
- [Red River UltraPro Satin](#)
- [Red River GreenPix Warm Tone](#)

Resources

Black & White test images

http://www.northlight-images.co.uk/article_pages/black_and_white_test.html

Onsight B&W Evaluation Image

http://www.on-sight.com/download/Onsight_BW_Evaluation.zip

Quad Tone Rip

<http://www.quadtonerip.com/html/QTRoverview.html>

Black & White Forums / Groups

<http://tech.groups.yahoo.com/group/QuadtoneRIP/>

<http://tech.groups.yahoo.com/group/DigitalBlackandWhiteThePrint/>