

## Hewlett Packard Z3100 Photo Black

### Diluted with MIS Gloss Optimizer/Amber Base

#### Epson WorkForce 1100 Printer & Potentially Many Others

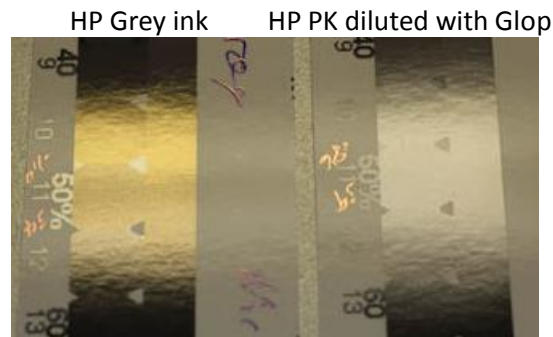
#### “HpGO” Inkset

[www.PaulRoark.com](http://www.PaulRoark.com)

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This effort combines the best blended (carbon plus color) neutral pigment – HP Z3100/3200 PK – with the best base in terms of suppressing bronzing – MIS Associates’ “amber” clear base, also previously sold as the R800 gloss optimizer. The 1100 is used, in part, as a test bed for this combination. The potential use of these inks for other printers is obvious. For example, it could be used in an 8-ink printer such as the 2800 or 7800 either as an Epson driver compatible monotone, or in a “Dual Quad” setup with either Eboni-4<sup>1</sup> or the warm-to-sepia tone, glossy or matte compatible, 100% carbon MIS “K4-Quad,”<sup>2</sup> combining the best 100% carbon with the best glossy neutral digital printing technology on the market.

#### Bronzing Compared



The reason for using the MIS Gloss Optimizer to dilute the HP Z3100 PK to make the inks used in this inkset is obvious from the above comparison. The print on the left was made with standard HP Z3100 Grey inks. The print on the right was made with HP Z3100 PK diluted with MIS Gloss Optimizer. The paper used was Epson Premium Photo Paper Glossy. This is an un-retouched, single photo of the reflections of a white fluorescent light (2 bulbs). HP Z3100 PK diluted with the generic base described at <http://www.paulroark.com/BW-Info/Ink-Mixing.pdf> shows the same bronzing as the HP Grey ink. MIS Associates’ amber base is their glossy dilution base that has been successfully used with MIS glossy-compatible pigments for years.

<sup>1</sup> “Eboni-4” = Eboni-6 Y, LM, M and K. The 1100 configuration of this is at <http://www.paulroark.com/BW-Info/1100-Eb4.pdf>. The 1400 configuration is at <http://www.paulroark.com/BW-Info/Eboni-6.pdf>.

<sup>2</sup> MIS LLK, 2 LKs and PK makes an excellent 100% carbon “sepia” inkset that is much like the HpGO inkset, except sepia toned. The ICC for such is in the Profiles Zip, linked further below.

## **“HpGO” WF 1100 “Quad” Ink Setup: PK or MK, 2 LKs, and & LLK**

K = MIS K4 PK<sup>3</sup> or MK (Ebony)<sup>4</sup>;

C = 33.3% HP Z3100 PK<sup>5</sup> + 66.7% MIS amber base<sup>6</sup>;

M = (The magenta-position ink is the same as HpGO-C, above -- a second LK-density ink);

Y = 33.3% HpGO C (or M ) + 66.7% MIS Amber base (11.1% PK, approximate LLK-density).

This setup uses a black (MK or PK) ink, 2 LK-density inks, and a single LLK density ink. Two LKs keep the approach consistent with the rough industry standard densities. With the LLK for the highlights, the 2 LKs allow overlapping profiling through the midtone print densities, resulting in excellent smoothness.

The reason for using the HP Z3100/3200 PK pigments is simply because they are the only neutral, blended carbon + color pigment that appears to be capable of making prints that do not show significant color shifting as they age. The HP pigments also do not show the separation and color changes typical of blended inks in wide format printers. While other neutral blended inks, such as those sold by the usual B&W inkset sources are fine for most uses with desktop printers, for high end fine art I consider HP Z3100/3200 PK to be the best, blended carbon-color, monotone pigment, second only to Ebony and MIS K4 PK based 100% carbon pigment inksets. No 100% carbon inkset can print a neutral image tone on glossy papers.

### **Printing Profiles**

This inkset makes a very nice print with no additional profiles at all. However, since this type of printing will use the 2 LK inks in the highlights as well as the LLK, the prints will not have particularly smooth highlights.

For the best printing, the HpGO should be printed with one of the ICC profiles provided in the this Zip file: <http://www.paulroark.com/BW-Info/1100-HpGO-Profiles.zip>

These ICCs print with just the LLK in the highlights and spread the starting points of the LK inks. This ICC printing workflow is a “color managed,” high bit depth, Epson driver based workflow. The ICC is selected in the Photoshop print preview. By being “color managed,” the relative densities of the print will match those of a calibrated monitor.<sup>7</sup>

Note that the 1100 and Photoshop CS5, used together, have a “bug” that causes a change in the profile used to not be used in the first print with that setting. When I change an ICC from what initially appears in the PS print dialog box, I make an initial plain paper (and fast) print with that ICC. That guarantees that the correct profile will be used when I use my good paper. Once a profile has been used with an

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<sup>3</sup> A 100% carbon photo black for glossy printing. See <http://www.inksupply.com/product-details.cfm?pn=K4-4-PK>

<sup>4</sup> Ebony MK is the K position of Ebony-6 and many other MIS inksets. See <http://www.inksupply.com/eb6.cfm> .

<sup>5</sup> See, for example, <http://www.atlex.com/cgi-bin/commerce.cgi?preadd=action&key=C9449A> (\$66 for 130 ml).

<sup>6</sup> See <http://www.inksupply.com/product-details.cfm?pn=ESC-BASE-4-UC> .

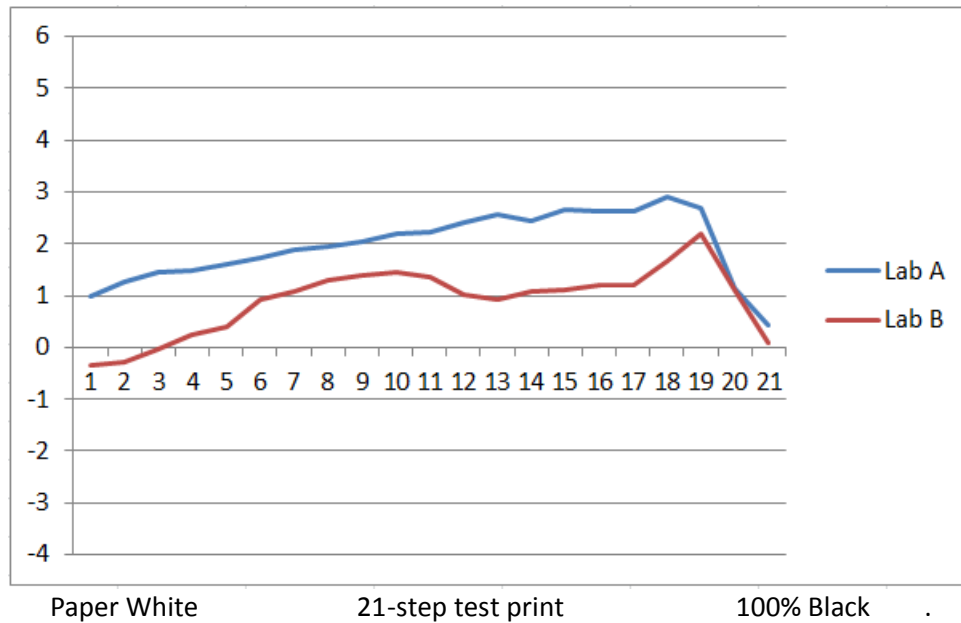
<sup>7</sup> QTR does not support the Epson 1100. For the 7800 dual quad proposed setup, QTR will be used.

image, that file can be saved, and the print dialog box will show the correct ICC the next time the image is printed.

A 400 dpi scan (grayscale) of a 21-step test print made with this curve in an ICC and printed on Canson Baryta paper is posted at <http://www.paulroark.com/BW-Info/Canson-1100-HpGO.jpg>. The Canson dmax with MIS PK and this setup is 2.32. There are no reflective artifacts in the print.

### Print Tones

The graph of the Lab A and B tones of a 21-step test print on Canson Baryta is shown below.

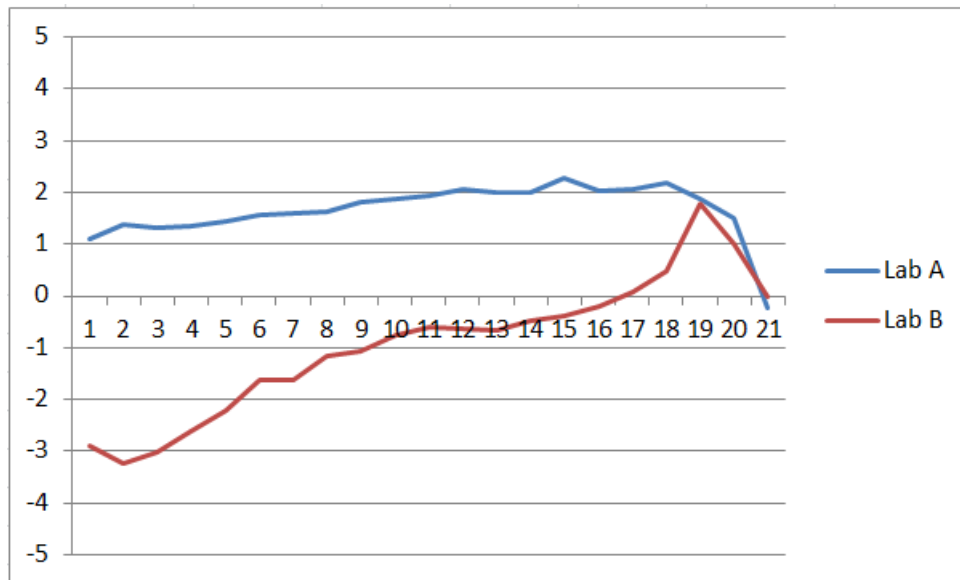


This is a relatively neutral print with just a hint of warmth.<sup>8</sup>

Red River Ultra Pro Satin,<sup>9</sup> a brighter, RC type paper has a finish that may be the most like my old air-dried, fiber-based, "F" surface darkroom prints. The Lab A and B of this paper are shown below.

<sup>8</sup> UT14-LC and HP grey are cooler. HP PK diluted with generic base is between these other combinations.

<sup>9</sup> See <http://www.redrivercatalog.com/browse/68lb-ultrapro-satin.html>



The warmth at the dark end of the Lab B curve is due to the MIS warm carbon PK. It is sufficiently dark at that point in the print that the warmth is not noticeable.<sup>10</sup>

I believe this is the best combination of top quality B&W neutral glossy printing solution, and it's very low cost for those who can do some basic ink mixing.

Another "best for the least" option for B&W.

Paul

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<sup>10</sup> Those who want a cooler black can use HP Z3100 PK.