

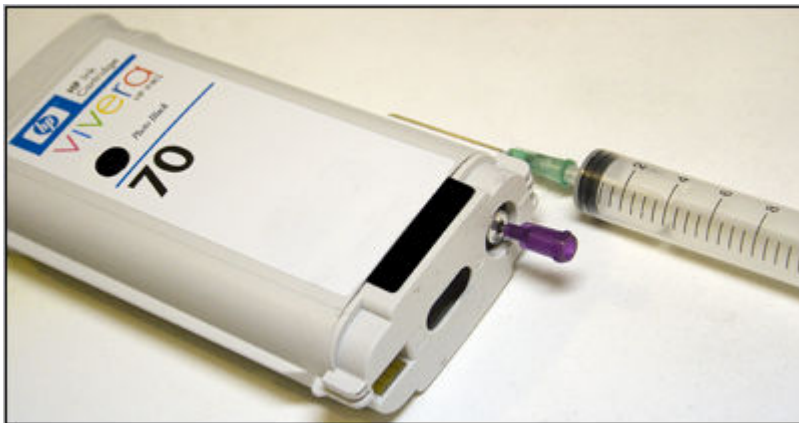
HP-C6 Inksets
www.PaulRoark.com
2-5-2010

HP Z3100/3200 Vivera Photo Black (PK) Pigments

These Hewlett Packard PK pigments may be the best current route to high quality, very lightfast and stable neutral glossy B&W printing. Either printed with a “black only,” 100% PK workflow in 1.5 picoliter printers¹ or used diluted (e.g. with C6 base²) in a partitioned workflow for other Epson printers, they are extremely stable, glossy and matte compatible, as well as relatively economical.

I use Eboni based inksets for my 100% carbon, matte, fine art B&W printing,³ and I use HP PK for my glossy printing.

The HP Z3100 cartridges are a convenient source of these pigments. With a syringe and a sharp needle the ink is easily removed from the Z3100 carts. See the photo below.⁴



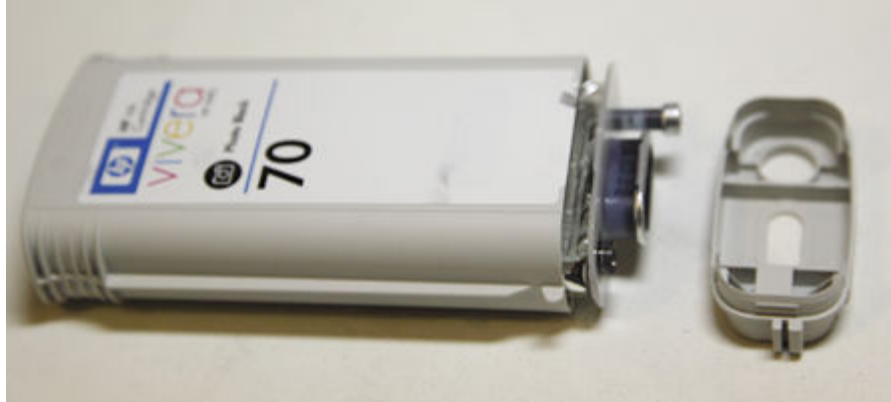
Alternatively, you can easily remove the entire internal bag and pour the contents into another container. Just cut the paper label that holds the end cap on. Pull that off and pull the bag out. The outer case must be spread a bit to release the pegs that hold the end piece in place. I just cut the corner of the bag off and pour the contents into another container. It's faster than using a syringe. See the photo below.

¹ See, for example, <http://www.paulroark.com/BW-Info/Eb1400.pdf>, which is a setup I use currently.

² See <http://www.paulroark.com/BW-Info/Ink-Mixing.pdf>

³ See, for example, <http://www.paulroark.com/BW-Info/7800-Carbon-6.pdf>

⁴ If the cart is used to store the ink, a dull needle would probably be better for subsequent withdrawals.



HP carts are reasonably priced at sources like Atlex.com, particularly the dual packs.⁵ If one assumes an average dilution of about 20%, the price of the mixed ink is less than the average prices of bulk third party inks purchased in the usual quantities.

The HP pigments have done very well in fade tests.⁶

Only a 100% carbon workflow such as the Eboni or Piezotone carbon sepia is likely to be more stable.⁷ The goal here is to take advantage of these HP neutral PK pigments in a variety of Epson printers, using more dilutions than HP uses for additional smoothness, and for a fraction of the cost of an HP OEM printing system.

Because the pigments are made for thermal heads, the viscosity of the HP OEM inks is less than the Epson inks. This puts even more pressure on HP to make very small pigment particles that stay in suspension well. When we raise the viscosity and specific gravity to what the Epson piezo heads can tolerate, these HP pigments are easily kept in suspension. In fact, in centrifuge testing, they stay in suspension in the C6 base better than in the lighter OEM HP base.

HP-PK Dilutions

⁵ See http://www.atlex.com/hp_designjet/z3100.htm

⁶ See Wilhelm Research at <http://www.wilhelm-research.com/hp/Z3100.html> and a summary of relevant Aardenburg-Imaging fade tests data at <http://www.paulroark.com/BW-Info/HP-K3-neutral-60MLuxHr.jpg>.

⁷ At 20 MLux-Hours of testing, the Photo Rag, 50% test patches' I* and Delta-e ratings for 6 B&W workflows were as follows:

Eboni 1800	I*=100.0, Delta-E=0.5;
Cone Piezotone Carbon Sepia	I*=100.0, Delta-E=0.4;
Cone Piezotone Neutral K6	I*=93.6, Delta-E=2.1;
Cone Piezotone Selenium	I*=94.9, Delta-E=1.2;
Epson 3800 K3 ABW	I*=100.0, Delta-E=0.7;
HP Z3100	I*=100.0, Delta-E=0.9.

Source: Aardenburg-Imaging fade test data at <http://www.aardenburg-imaging.com/cgi-bin/mrk/4013c2hvd19kb2NfbGlzdC80>

I use the “C6” type of generic clear base to dilute these pigments.⁸

There are numerous variations that can be based on dilute HP PK. At this point, I recommend that the highest HP dilution (after the 100%) be 30%, this is similar in density to Epson LK. 30% is typical of the dilution ratio that works well with Epson driver. 30% of LK is similar in density to an LLK.⁹

Glossy prints made with HP PK do show bronzing. As such, one might want the Y position of the printer for a gloss optimizer.

The HP-PK dilutions can also be used with Eboni MK for matte printing. For a general hextone inkset that can do it all, consider K=Eboni, C=HPPK, LC=30%HPPK (or HP grey), Y=9% HPPK (or HP light grey), M=MIS K4 LK, LM=MIS K4 LLK. If neutral is the target and gloss optimizer is wanted, substitute glop for MIS LLK.

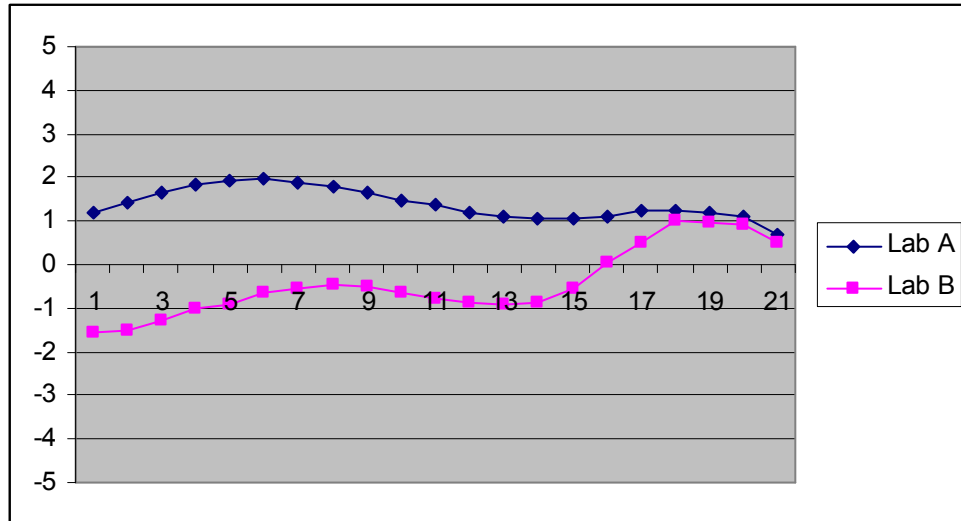
⁸ See <http://www.paulroark.com/BW-Info/Ink-Mixing.pdf> I have used this type of base for Eboni for several years now without problems. I do not have extensive experience with the dilute HP PK, but I have seen no problems in my inksets. It is up to every user to assess their own risks in this open source approach.

⁹ Epson and MIS LK and LLK are warm, outside of what is generally considered a neutral B&W print.

HP PK Print Tones

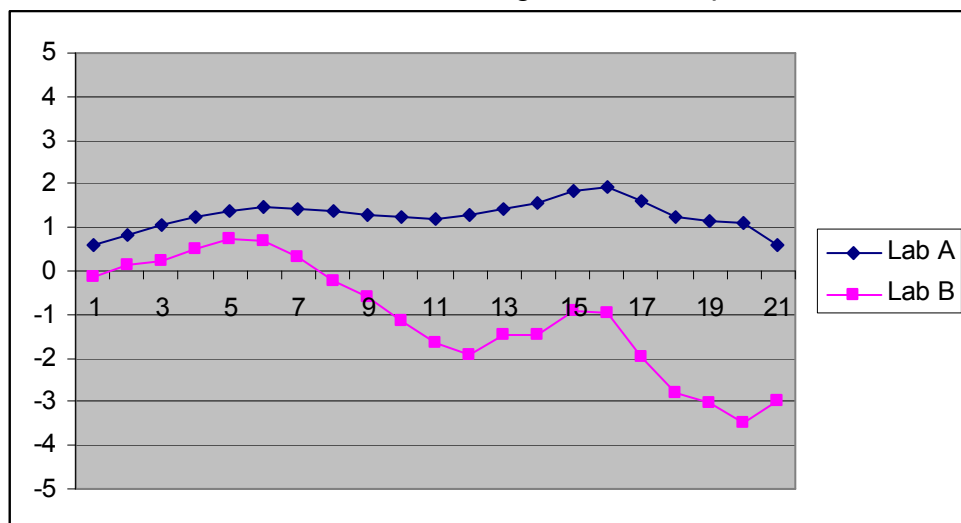
With only the dilute HP PK pigments and MIS Eboni MK, the print tones are neutral-cool. See the graphs of the Lab A and B values from 21-step test files, below.

EEM-UPPM, QTR “Cool” profile (only HP dilutions and Eboni MK)



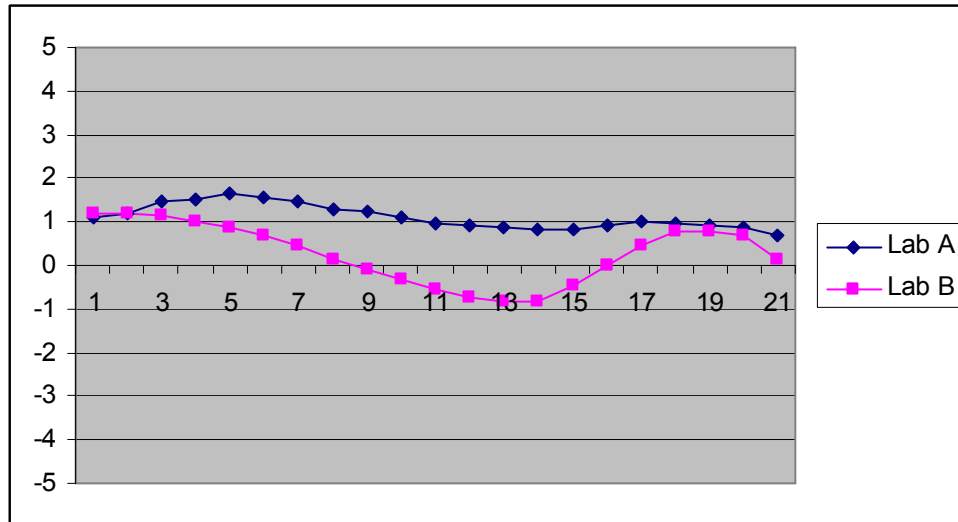
Paper White 21-Step test print 100% Black

Crane Museo Silver Rag, QTR, Cool profile



Paper White 21-Step test print 100% Black

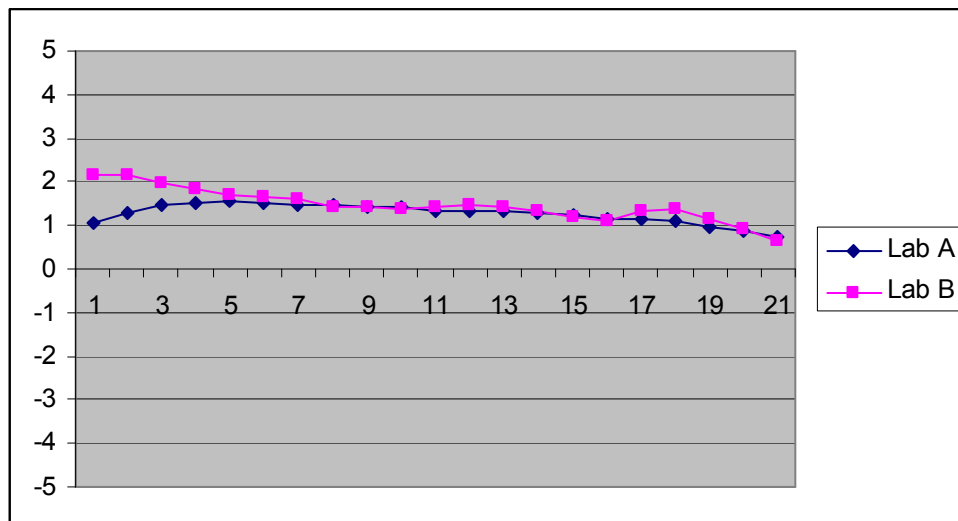
PermaJet Alpha (Innova Soft Texture), QTR “Cool” profile



Paper White 21-Step test print 100% Black

If one prefers a more neutral print with a straight line Lab B from the paper white to the shadows, MIS LK, a warm, glossy-compatible carbon pigment, can be used to straighten the tonal response. With this warm carbon toner added, Innova Soft Texture prints as shown below:

PermaJet Alpha (Innova Soft Texture), “Neutral” PS Curve, Epson driver



Paper White 21-Step test print 100% Black

It appears one can straighten the Lab B curve with only LK and still not have visible dots in the highlights. As noted above, if more warmth in the light midtones is needed, an LLK might be called for.

MIS Gloss Optimizer and Glossy Papers

Several people have tried MIS's R1800 gloss optimizer ("glop") to dilute HP Pk. Glop has been used for some time to dilute MIS pigments for glossy printing and works well. It contains a binder and coating material that both reduces bronzing and helps avoid smearing of the pigments on some glossy surfaces. As a base that contains a binder, I would not expect it to be as clog free as the C6 base, but it should be in the normal range of clogging, and those who have used it do not report any significant clogging. MIS glop can be purchased at http://www.inksupply.com/r800ink_org.cfm

Note again that this approach is made only as a suggestion for those who are comfortable with mixing their own inks.

www.PaulRoark.com