

Carbon-6, Dilute Eboni-based Inkset

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The “Carbon-6” inkset is an open-source version of the Eboni-6 inkset, which can be purchased pre-mixed from MIS. The Carbon-6 inkset uses the open-source base, described at <http://www.paulroark.com/BW-Info/Ink-Mixing.pdf> and, in its original form, slightly different mixing ratios that were intended to make it easier to mix for those who do not have accurate scales available. Suitable for many Epson printers, it successfully ran in my 2200 with a CIS for about 9 months. I stopped that test to move on to the HP-C6 version. Note that for 1.5 pl printers the C6 base must include the Edwal wetting agent.

Eboni-6, which is discussed at <http://www.paulroark.com/BW-Info/Eboni-6.pdf>, is currently in my Epson 7500 printer, and 100% Eboni and the 3-MK workflow will remain a standard for the R1800. (See <http://www.paulroark.com/BW-Info/R1800.htm>)

Agitation is required with this inkset. The only technical weakness I’ve found with Carbon-6 and Eboni-6 is that they settle faster than normal. So, while it’s very consistent in desktop printers, where normal printing agitates the cart, in wide format printers it is not recommended unless one is willing to do what is necessary to keep the pigments suspended. 100% Eboni carbon pigment is an excellent ink for the K position, but dilute Eboni needs to be agitated regularly. I do this successfully in my 7500 by rolling the ink end of the printer back and forth vigorously and regularly. Some who use funnel-filled carts find that syringes can be used to agitate the inks in the carts. With a 3800, a CIS with Carbon-6 would be easy to agitate.

Carbon-6 is for matte paper printing, as the Eboni carbon particle does not have a glossy coating.

While Eboni is the most neutral carbon pigment I’ve found, it still tends to be warm when diluted. The paper used makes a significant difference. A few papers do result in neutral images. Premier Art Smooth BW is the most neutral paper I’ve found with this approach. Arches un-coated paper is creamy but holds the change in Lab B to one unit.

(By the way, “C” is the symbol used for carbon in chemistry, and the atomic number of carbon is 6. See <http://en.wikipedia.org/wiki/Carbon>. But I intended the “6” to refer to the number of different densities of carbon pigments are in the inkset.)

The different version of the dilute Eboni (C-6 like) inkset for the C88 is discussed at <http://www.paulroark.com/BW-Info/C88-C13-5.pdf>

Carbon-6, Dilute Eboni Mixing Ratios

Original Carbon-6 mixing ratios

The goal here was not only to have an even distribution of densities, but also to keep things as simple as possible.

The Carbon-6 inkset dilute gray (or “color”) positions start with a 2:1 dilution of Eboni (2 parts base to 1 part Eboni). Then the remaining 4 gray positions are 1:1 dilutions of the next denser ink. (Again, this mixing is different than Eboni-6. The Eboni-6 mixing ratios are given further below, and I personally prefer the Eboni-6 ratios.)

The inks are arranged so that the Epson driver, as well as QTR or other rip, can be used for printing. Specifically, the inks are as follows:

K = Eboni,
C = 2 parts base to 1 part Eboni (33.3% Eboni),
M = 1 part base to 1 part C, above (16.7% Eboni) (also for LK),
LC = 1 part base to 1 part M, above (8.33% Eboni),
LM = 1 part base to 1 part LC, above (4.17% Eboni) (also for LLK),
Y = 1 part base to 1 part LM, above (2.08% Eboni).

The specific gravity of the base and Eboni are close enough that either volume or weight can be used to do this. While a good scales that reads to 0.1 gram is most accurate, a syringe or similar measuring device can also be used.

Mixing as well as controlling this inkset can be a relatively quick process. (Just to see how fast it could be done, I timed myself. Working from bottles of Eboni and pre-mixed base, I mixed the inks, loaded R220 carts and printer, and made an ICC in 35 minutes. I used one 35 ml syringe for both measuring and mixing. No scales or other equipment are needed.)

For details of the progressive mixing used above, see <http://www.paulroark.com/BW-Info/C6-Progressive-mix.pdf>

I usually use my scales to mix C-6 in 100 gram quantities.

Modified Carbon-6 Mixing Formula for 2400 and other K3 Printers

The above formula works fine in hextone and even the K2 printers. However, in the 2400, and probably other K3 printers, the heavier “gray substitution” of those printers causes posterization in the deep shadows on some papers due to the relatively high density of the C and lower than normal density of the LK. To fix this, C and LK need different mixing ratios, as follows:

C = 30% Eboni

LK = 18% Eboni.

These are actually the “normal” densities for these positions and what is used in Eboni-6, but they are not as easy to mix as the original hextone C6 ratios.

The rest of the inkset can be left as is.

“Eboni-6” Mixing Ratios

MIS makes a version of this inkset using its proprietary dilution base. It uses slightly different mixing ratios – the original ones that I made for this general approach. The K4 printer modifications, above are consistent with these mixing ratios, which follow closely mixing ratios and densities that have worked very well for a number of years in other inksets I’ve designed. As such, I have a preference for these mixing ratios:

K = 100% Eboni
C = 30% Eboni, remainder C6 base
M = 18% Eboni
LC = 9% Eboni
LM = 6% Eboni
Y = 2% Eboni
LK = 18% Eboni
LLK = 6% Eboni

I recommend these mixing ratios. They have worked well for a long time with many inksets I’ve designed.

Workflows

For notes on the Carbon-6 printing workflow, see <http://www.paulroark.com/BW-Info/C6-Printing-Workflow.pdf>

Good luck with what is probably the most lightfast as well as most inexpensive B&W inkset. As an added benefit, the dilute C6 positions are the most clog-free of any inkset I’ve ever used.

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