

Epson WorkForce 1100

Black and White Noritsu-Epson Dye Ink

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(This is an early draft and work in progress)

The WorkForce 1100 is Epson's least expensive printer that can handle 13" wide paper. This \$180 printer has 2 black cartridges for very fast text printing.¹ It ships with Durabrite pigment inks and uses only 3 colors – no "light" color inks. The WF 1100 is what I have used for some time as my default office printer, and it lends itself very well to an efficient and easy ink setup where all the "color" positions are a single neutral, glossy, light black ink, an ink arrangement I call the "K2-Quad" approach.²

The ink arrangement discussed here uses the Noritsu-Epson (Claria equivalent) dyes that have been made into a B&W inkset.³ The goals for this printer-ink combination are to make a very fast text printer that can also make outstanding B&W glossy prints and cards, and be clog free. So far these goals have been met.⁴

¹ For Epson WF1100 product information, see http://www.epson.com/cgi-bin/Store/isp/Product.do?BV_UseBVCookie=yes&sku=C11CA58201

² For information on the WF 1100 and other inks, see <http://www.paulroark.com/BW-Info/1100.pdf> and <http://www.paulroark.com/BW-Info/1100-Eb4.pdf>

³ See <http://www.paulroark.com/BW-Info/BW-Dye.pdf> for general information about these dyes.

⁴ I have used the same mix in my Epson 1400 for making cards and brochures for about a year with outstanding success. I also set up the WF 30 with this approach. See <http://www.paulroark.com/BW-Info/WF30-BW-Dye.pdf>. The glossy prints and cards this dye ink makes are, in my view, simply better looking than any pigment system is capable of.

A. Inks – K2-Quad

“K2-Quad” is meant to signify that it uses 2 densities of black/gray – a PK and an LK – in a printer setup that uses 4 channels of grayscale inks.⁵ Particularly when an appropriate ICC profile is used that starts the inks sequentially, the approach results in smooth, artifact-free prints.⁶

Black positions = Noritsu D700 “dry lab” ink⁷

Color positions = 30% (13% Noritsu/Claria magenta,⁸ 87% Noritsu K), 70% clear dilution base.⁹

The need to mix the inks is clearly a barrier for most users. The trade-off is that one gets unique B&W glossy capabilities for a fraction of the cost of standard Epson inks; but with this system one also has to buy large quantities of Noritsu ink, mix inks, including a clear dilution base that requires more chemicals, and load empty cartridges.¹⁰

These advanced dyes are **lightfast** enough for most uses. Wilhelm Research rates Claria color photos at 98 years of display life when displayed under glass; over 200 years when in an album or dark storage.¹¹ When Claria black only prints are sprayed with Premier Art Print Shield, they appear to be in the Epson

⁵ The midtone ink density of the “K2-Quad” setup discussed here and also used in the Epson WF 1100 setup uses a different density of gray ink than does the MIS EZ system, which was developed by me for the C82 and commercialized by MIS Associates. Note also that although the WorkForce line of printers has 5 inks, 2 of those are black inks that function as a single channel with the Epson driver.

⁶ For the ultimate in smooth highlights, an LLK can be used, but the need for difficult and sensitive partitioning curves and profiles makes this an option that most will not see as a good trade-off. Only the most critical pixel peepers will ever see any dots in K2-Quad prints.

⁷ Sold in 500 ml carts for \$187, see Appendix A (p. 12) of <http://www.paulroark.com/BW-Info/BW-Dye.pdf> for suppliers. The usual bottom-fill adapters are used to pull ink out of the large Noritsu carts. See <http://www.paulroark.com/BW-Info/Modified-Bottom-Fill-Adapter.pdf>

⁸ Given the cost of the Noritsu carts, using a small Claria cart (e.g., for an Epson 1400) as a source of the magenta may be a good alternative for those who mix small batches of inks.

⁹ The clear dilution base is as follows:

- 10% glycerol,
- 10% Kodak Photo Flo,
- 10% Dow Butoxytriglycol,
- 1% Edwal LFN,
- 69% distilled water.

Dow Butoxytriglycol™ is \$50/quart from Chemical Marketing Concepts [Dow] at 860-354-2278

(See http://www.dow.com/products/product_detail.page?display-mode=tds&product=1123830&application=1120800 for technical information on the Dow Triethylene Glycol Monobutyl Ether [aka Cas # 143-22-6]; see also page 17 of http://www.dow.com/PublishedLiterature/dh_0032/0901b80380032bc8.pdf?filepath=oxysolvents/pdfs/noreg/110-00965.pdf&fromPage=GetDoc) See <http://www.noritsu.co.jp/english/msds/pdf/d701/ENA/MSDSH086075-00-01-NA-E.pdf> for the Noritsu MSDS.

¹⁰ If you are interested in pre-mixed dye inks, contact me at roark.paul@gail.com. MIS Associates is the source for carts and other ink loading accessories. See http://www.inksupply.com/printer_products.cfm/p/Epson_WorkForce_30.html at the bottom of the page for empty cartridges.

¹¹ See <http://www.wilhelm-research.com/epson/RX595.html>

UltraChrome pigment class in terms of lightfastness.¹² I make no claim for lightfastness for this inkset. I'm comfortable using this un-sprayed for cards but recommend 100% carbon for fine art and where long life is a top priority.¹³

With the high dark storage rating and in light of the fact that dyes do not sit on top of the paper like pigments, the use of these dyes might also be very good for **books** or applications where pigments would be subject to rub-off problems.

Note, with respect to the MIS **auto-reset chips** on the carts, when the chip signals the printer that the cart is empty (whether it is or not), the cart probably will need to be removed (such as checking to see if the cart is empty) and re-inserted (such as would be done after the cart was re-filled). Typically MIS WorkForce printer chips can be checked and reset at any time when the chip indicates, In the Epson driver "Status Monitor" (driver Maintenance tab) that it is less than 10% full.

B. Papers

The dyes print well on most glossy papers. The paper I most favor for cards and brochures is **Red River Polar Pearl Metallic**.¹⁴ The Red River UltraPro Satin paper is also a very good paper for this setup.

For a brief description of my procedure for making **cards**, see <http://www.paulroark.com/BW-Info/Card-Procedure.pdf>.

On matte papers there is a tendency to either print with a weak dmax (maximum black density) or be too green in tone. For example, Epson Ultra Premium Presentation Matte has a reasonable print tone, but the dmax is weak. Hahnemuhle Photo Rag has an excellent dmax but is too green.

The only matte paper I've tested that combines good print tone with outstanding dmax is the Red River Premium Matte Plus.¹⁵

The print tones for the recommended papers, above, are all neutral. All of the papers are "brightened." As such, the cool paper tone is continued through the rest of the print.

¹² See <http://www.aardenburg-imaging.com/> fade test data. Compare the results of the 1400 black only, sprayed print on Canson paper with UltraChrome ABW results.

¹³ See <http://www.paulroark.com/BW-Info/Eboni-6.pdf>

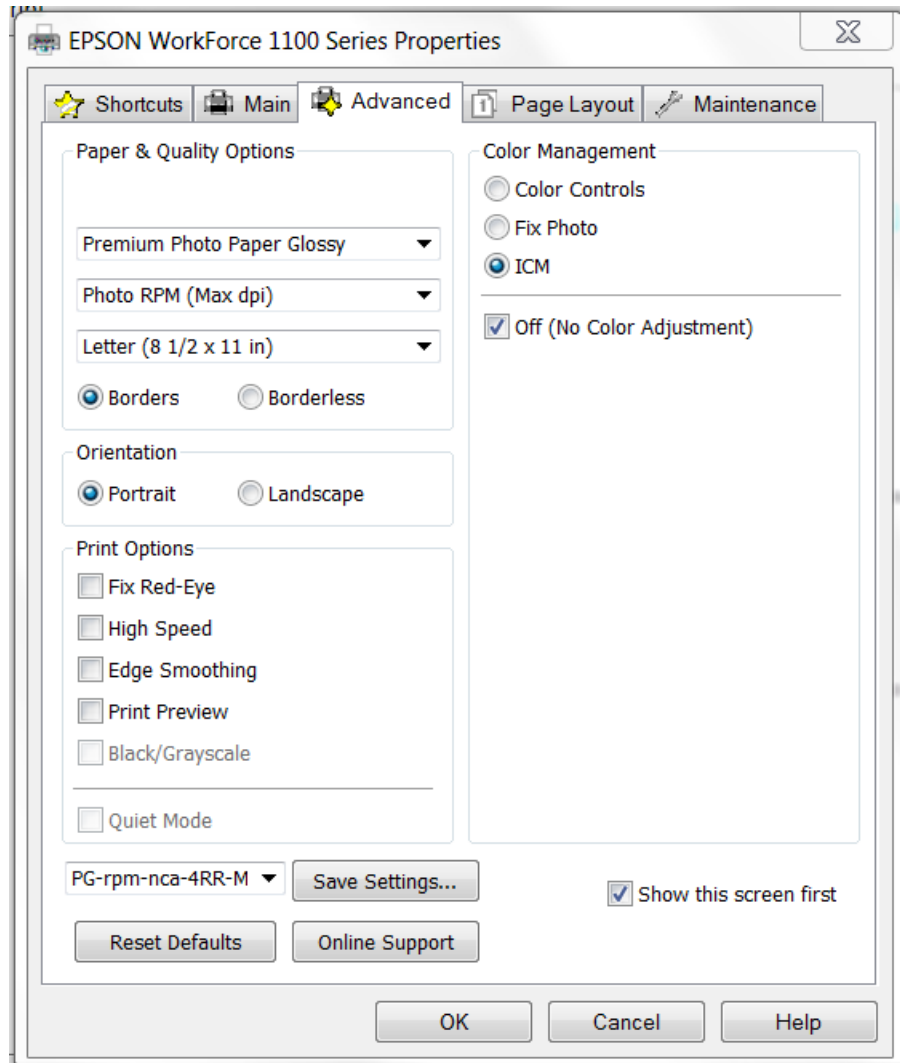
¹⁴ See <http://www.redrivercatalog.com/cardshop/scored/66-polar-pearl-metallic-framecard.html> for the card stock I use most.

¹⁵ See http://www.redrivercatalog.com/browse/60lb_premium_matte_plus.html

C. Workflow – Printing Procedure

1. Driver Settings for Photos

To print glossy cards or other photos, the best quality settings are used. See the screen grab, below.

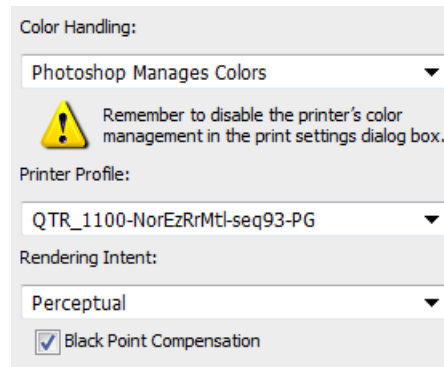


For matte paper the paper type would be “Premium Presentation Paper Matte.” I always use the best printing quality for photographs.

2. ICC Profiles

For good photos, ICC profiles are recommended. Profiles for the above papers are available at <http://www.paulroark.com/BW-Info/WF1100-Noritsu-Roark.zip>.¹⁶ These ICCs were made with QTR's Create ICC-RGB¹⁷ and contain Photoshop curves for the glossy and matte papers. These curves are in the above Zip file and should be useable with other papers.¹⁸

In Photoshop, the ICCs are selected in the print preview. The right side of such a preview is shown below.



(Ignore the exclamation mark. It is only to remind people that the driver should be set to “ICM” and “No Color Adjustment.”)

One characteristic of the WF 1100 that these ICCs and curves correct is that it uses an excessively high ink limit for most papers. Aside from this, the curves sequentially start the color-position inks, making for smoother prints.

I hope this setup works for you. For fast text printing, outstanding and unique B&W glossy cards and prints, ease of use and maintenance, clog-free performance, and reasonable cost, this combination is an interesting alternative.



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¹⁶ With the ICC on the Desktop, right clicking will show a menu that includes the option to install the ICC. In Windows they are typically in C:/Windows/System32/spool/drivers/color. In Macs the ICCs are in /Library/ColorSync/Profiles.

¹⁷ See <http://www.quadtonerip.com/html/QTRdownload.html>

¹⁸ See http://www.paulroark.com/BW-Info/Embedding_Photoshop_Curves_in_ICCs.pdf for information on using curves and Create ICC-RGB to make ICCs.