

Noritsu-based 5K Plus LM & Y B&W Inkset, “NK5” Epson 4000 Printer

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This PDF describes an inkset, workflows and profiles for using the Epson-Noritsu advanced dyes to make a black and white inkset for printing with the wide format Epson Stylus Pro 4000 printer. Noritsu-based dyes have been used successfully by me and others in Epson printers, including the 4000 for several years.¹ QuadToneRip (“QTR”)² or other rip is needed to print this inkset.

In my view, dye-based prints are for dramatic, high gloss display. They can show off an image with an apparent sharpness and dynamic range that is beyond the alternative media. B&W dyes particularly on metallic paper are often described as having a “three dimensional” look to them.³ On the other hand, carbon pigment prints are for long term display, collecting, and top fine art. They are two different media.

The Epson-Noritsu advanced dyes are similar to the Claria dyes that Epson sells for its desktop printers.⁴ Noritsu sells the Epson dyes to the “dry lab” market that uses the latest Noritsu mini-lab printers. The supply chain for this commercial photo printing market appears to be a good source of dyes in bulk. The Noritsu ink prices are generally consistent with Epson’s large format pricing structure on a per-volume basis; about 1/3 the cost of inks in small carts. Most of the ink positions, however, are dilute inks, where the very low cost of the dilution base makes the inkset, overall, very inexpensive.

When modified to be a B&W inkset, these dyes are capable of making visually stunning B&W high gloss images that do not have the artifacts, including bronzing, and veiled look that have limited the quality of glossy printing with popular pigment inksets. Not being on the surface, dyes do not rub off the way pigments can. Dyes do not have particles and binders to clog, nor do they settle.

While these dye-based prints are not as lightfast or archival as 100% carbon prints, for many uses they are stable enough; fade tests of Epson Claria prints have done better than some third-party color pigments. Wilhelm-Research rates Claria color prints as having a display life,

¹ The best 13” printer for B&W Claria-Noritsu printing is the 1400 (or 1430 now). See <http://www.paulroark.com/BW-Info/1400-Claria-Noritsu-2K2LK.pdf> ; The 1400 setup is much easier and the primary recommended approach if wide format is not needed. See <http://www.paulroark.com/BW-Info/4000-Noritsu-BW-Variable-Tone.pdf> for a blended variable-tone Noritsu-based inkset approach that is Epson driver compatible. I decided to abandon the blended approach due to risk of catalytic dye interaction and the more limited control of the blended approach.

² See <http://www.quadtonerip.com/html/QTRoverview.html>

³ I primarily use Red River Paper’s “Polar Pearl Metallic” paper for these dyes. My September 2013 Gallery Los Olivos show <<http://www.gallerylosolivos.com/Roark.html>> used all 17” roll metallic paper in the front room and Red River’s 80 Lb. version for the cards. See <http://www.redrivercatalog.com/browse/photo-metallic-inkjet-glossy-media-paper-metal.html> for Red River’s metallic paper.

⁴ Lab A and B measures of the Claria and Noritsu black inks suggest they are identical. See <http://www.paulroark.com/BW-Info/Noritsu-Claria-BO-Lab.jpg> .

under glass, of 98 years, and over 200 years in dark storage.⁵ Aardenburg Imaging and Archives⁶ has tested color Claria as well as black-only Claria. Of particular note is the black-only Claria that was treated with a protective spray. Its performance on Canson Baryta paper was similar to what one would expect from Epson's color UltraChrome pigment inkset, with a Conservation Display Rating many times that of the un-treated Claria color print.⁷

Note that the paper used can make a major difference in image stability. As good as some of the tests are, I would expect dye-based prints to show significant visual differences after a few decades.

If one still likes the dye image after a few years, buying a carbon pigment version of it for the long haul is highly recommended.

"Carbon on cotton" (100% carbon pigments on cotton-based paper) will remain the top, collectible medium.

Vita brevis, Ars longa
(Life is short , Art is long)

⁵ See <http://www.wilhelm-research.com/>

⁶ See <http://www.aardenburg-imaging.com/index.html>

⁷ See http://www.aardenburg-imaging.com/cgi-bin/mrk/_4899c2hvd19kb2NfbGlzdC80; The data can be arranged by column in ascending or descending order to see better how the coated Claria black only compares to UltraChrome. For perspective, compare the amount of total fade and color shift of a 50% neutral test patch after 100 Mega-Lux hours of exposure (about 51 years of display as used by Wilhelm Research). The lower the "delta-e", the better. Fujicolor Crystal Archive paper (a traditional color print wet process) = 23.6; Epson Claria color = 7.9; Claria Black only on Canson paper = 11.3; Claria Black Only on Canson paper with a protective spray = 3.7. I spray my B&W NK5 display prints.

The ink arrangement for the “NK5” inkset is as follows:

PK (NK) = Noritsu K⁸ (“NK”)⁹

C = 33.3% NK (remainder 66.7% dilution base¹⁰) (1:2 mix)

LC = 11.1% NK (1:2 mix of the above)

M = 20% NK (1:4 mix)

LK = 6.67% NK (1:2 mix of the above)

Y = Noritsu Yellow

LM = 30% Noritsu M.

The Noritsu K has a greenish tint. As such, toning with magenta is all that is needed to make neutral/cool appearing prints. However, the yellow is also useful for more complete control, including potential reduction in color inconstancy/metamerism. I do use small amounts of yellow in my profiles.

Most matte papers have a weak dmax. The popular Hahnemuhle Photo Rag has an excellent dmax and, relative to the average glossy paper, needs twice as much magenta in the profile to look neutral. Photo Rag, when printed with these dyes, has the best dmax I’ve ever measured

⁸ Dry lab photo finishing suppliers are numerous. This is a partial list of Noritsu suppliers.

<http://www.fotoclubinc.com/> (Los Angeles area);

http://www.imagingspectrum.com/noritsu-d703-digital-dry_photo_printer-d703.html (TX);

<http://serranorey.com/222-noritsu-dry-supplies.html> (FL);

http://www.desktopdarkroom.com/noritsu_d701_ink.html (FL);

<http://www.sgaimaging.com/catalog/printers-scanners/noritsu-compact-inkjet-printers> (GA & FL);

<http://www.southpointphoto.com/productcart/pc/viewPrd.asp?idcategory=115&idproduct=1064> (TX & TN);

<http://www.fotoclubinc.com/Departments/Printer-Media/Noritsu-Media/Noritsu-D701D703D1005-Inks.aspx> (Santa Fe Springs, CA); http://www.pfsny.com/M/Noritsu/Noritsu-Dry-Lab/Noritsu-D703_.html (NY). If purchasing on eBay and the price is less than \$187, check the expiration date.

⁹ The MK position has clear base in it.

¹⁰ MIS sells the clear base pre-mixed at <http://www.inksupply.com/product-details.cfm?pn=PR-CLEARBASE-PT>.

The clear dilution base formula, by weight, is as follows:

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

If mixed by volume, reduce the glycerol to 8%; the other ingredients are close enough to leave as is by volume or weight. If mixed to make a 1000 ml pitcher full, it is easily done without any scales; the small 1% Edwal LFN amount is simply a 10 ml syringe full. 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.paulroark.com/BW-Info/Noritsu-MSDSH086075-00-01-NA-E.pdf> for a copy of the Noritsu black ink MSDS.

with matte papers.¹¹ The matte paper that may be the best combination of excellent dmax, low magenta toning requirement, and price is Red River Premium Matte.¹²

In general, I see this inkset as primarily for glossy paper, and it is at its best with high gloss materials. The primary printing paper I use with this paper is Red River's Polar Pearl Metallic.¹³ With the metallic paper the image almost takes on a 3D look. Combined with a high resolution image file, the results can be quite effective.

More experience is needed to know what the value of this B&W printing approach is, but initial display prints have sold better in competition with color paintings than any other approach I've tried. If nothing else, it is an interesting alternative to the carbon on cotton.

Enjoy.

Paul

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¹¹ A fully "cured" Photo Rag test strip made with an Epson C88 had a dmax of 2.05. Most "fresh" test strips with the 4000 and Photo Rag are in the high 1.8 range.

¹² See <http://www.redrivercatalog.com/>. Epson Ultra Premium Presentation Matte paper, typical of many matte papers, prints with a low dmax.

¹³ See <http://www.redrivercatalog.com/browse/66lb-polar-pearl-metallic-inkjet-photo-paper.html>

Appendix 1
Screen grab of QTR settings

QuadToneRIP Graphical Interface Version 2.7.0.0

File View Tools Help

Paper: Custom

Width: 17 Length: 9 Units: ☒ in ☐ mm

Orientation: ☒ Portrait ☐ Landscape

Media: Source: Roll Feed (Cutter On) Type: Matte Paper

Printer: <Quad4000>

Copies: 1

Placement: ☒ Centered Top: 0.74 Left: 0.15 in

Scale: ☐ To Fit 100 %

C:\Users\Pau\Desktop\J-Roark-Good-Bye-qtr.tif

Curve Setup

Curve 1: NK5-RrMetallic-M1 Resolution: 2880 dpi

Curve 2: None Speed: Uni-directional

Curve 3: None Black Ink: Photo Ink

Curve Blending

☐ Split Tone Curve Blending

	Highlights		Midtones		Shadows	
Curve 1:	100		100		100	
Curve 2:	0		0		0	
Curve 3:	0		0		0	

Advanced Adjustments

Not Monitoring | Automatic check for updates is disabled.