

Epson 1400

B&W Printing with Claria/Noritsu Dyes

Claria/Noritsu “2K-2LK” QuadTone Inkset

www.PaulRoark.com

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This is the latest – and best – in a series of experiments with the Claria/Noritsu advanced dyes in 13” printers.¹ It is a dedicated, variable-tone B&W inkset that prints well with the Epson driver (for speed and multiple profile printing) or QuadToneRip (QTR)² for the optimal use of the black & gray inks. If you can load empty cartridges, you can use this inkset.

Inkset Arrangement

<i>Cartridge Position</i>	<i>Ink</i>
K/Black	Claria or Noritsu K/Black
Cyan	Claria or Noritsu K/Black ³
LC	Claria/Noritsu “LK” (1 part Noritsu or Claria K, 2 parts clear dilution base ⁴)
Magenta	Claria/Noritsu “LK”
LM	Claria LM
Yellow	Claria Yellow

¹ See <http://www.paulroark.com/BW-Info/BW-Dye.pdf> for general information regarding these dyes. Epson sells the Claria-type dyes to Noritsu, which uses them in the “dry lab” mini-lab industry. See <http://www.paulroark.com/BW-Info/4000-Noritsu-BW-Variable-Tone.pdf> for the wide format version of these inksets.

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

³ See http://www.inksupply.com/printer_products.cfm/categoryID/9/p/Epson_Stylus~Photo_1400.html for empty cartridges for the 1400. MIS’s latest carts/chips appear to work well in conjunction with Epson carts/chips. See page 12 of <http://www.paulroark.com/BW-Info/BW-Dye.pdf> for a partial list of Noritsu ink suppliers. I recommend purchasing a Noritsu K cart (after you have tested the inkset using Epson Claria black carts as the source of ink). I do not recommend purchasing Noritsu carts for the colors; the volume is much more than needed.

⁴ See <http://www.inksupply.com/product-details.cfm?pn=PR-CLEARBASE-PT> for the pre-mixed base. This is a very easy ink to mix. No scales are needed. Just use a 10 cc syringe – one full of black ink, then 2 full of clear base, mix in a glass, and fill the 2 empty carts from MIS for the LC and M positions.

The clear dilution base is as follows, by weight:

- 10% glycerol (8% by volume),
- 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.

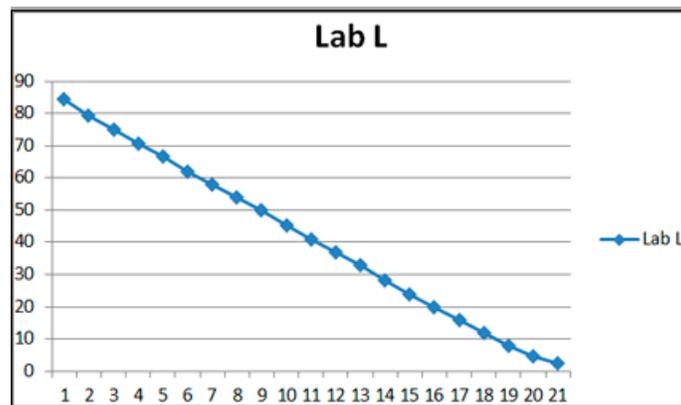
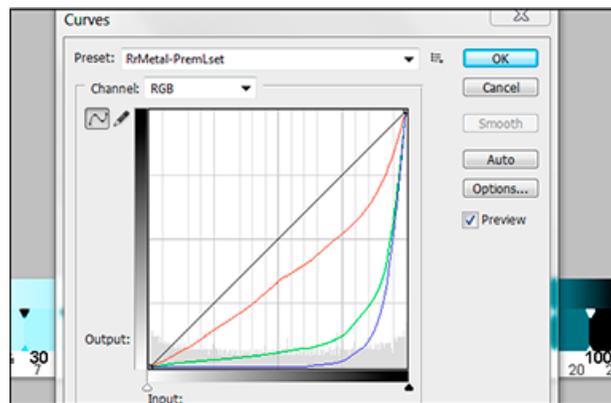
(See http://www.dow.com/products/product_detail.page?displaymode=tds&product=1123830&application=1120800 for technical information on the Dow Triethylene Glycol Monobutyl Ether [aka Cas # 143-22-6]; see also page 17 of http://www.dow.com/PublishedLiterature/dh_0032/0901b80380032bc8.pdf?filepath=oxysolvents/pdfs/noreg/110-00965.pdf&fromPage=GetDoc) See <http://www.paulroark.com/BW-Info/Noritsu-MSDSH086075-00-01-NA-E.pdf> for a copy of the Noritsu black ink MSDS . No scales are needed to mix a liter by volume with sufficient accuracy and a 1:2 dilution. I use a 10cc syringe to measure the smaller amounts and to mix the “LK” (1:2 dilution of K).

There is no LC (Light Cyan) ink, as such, in the mix setup. The Claria/Noritsu black already has a green-cyan bias that is sufficient to reach all normal print tones. For good “neutral-cool” print tones only LM is usually needed. This makes for very easy tone control and profiling. The Claria yellow ink is needed for not only warm print, but also to control the optical brightening agents (OBAs), particularly on the borders, where they tend to pull the eye out of the image.

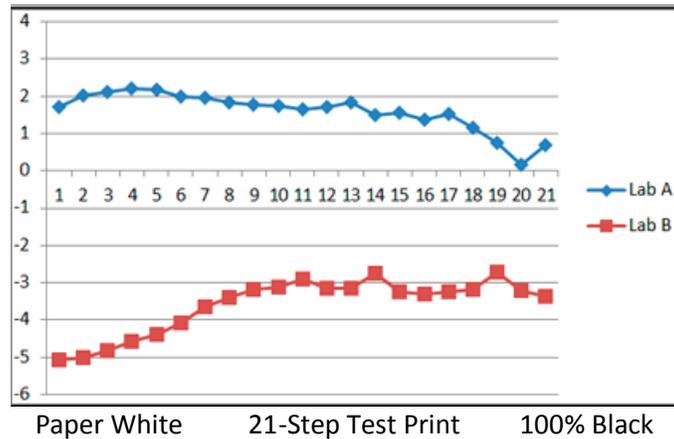
Printing Workflows/Procedures

Epson Driver Workflow

Photoshop Image Adjustment curves can be used to profile this inkset. One such set of curves is shown below. This set of curves produced a 21-step test print with the Lab L, A and B readings shown further below.⁵

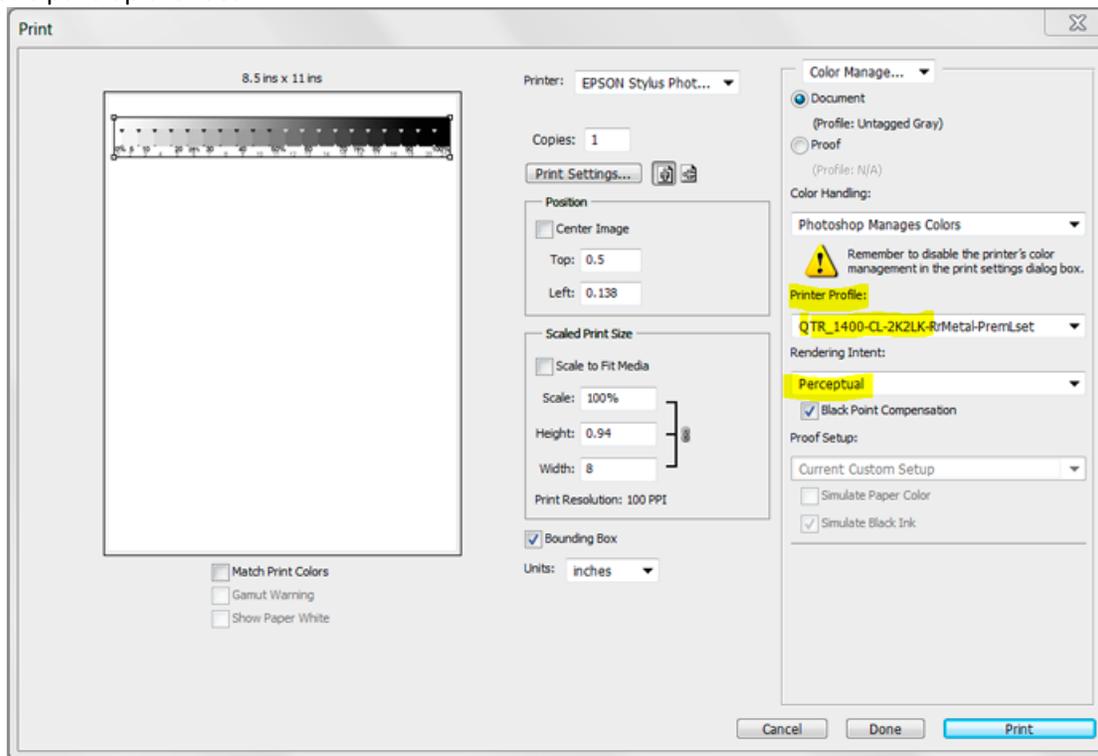


⁵ The paper used for this was Red River Polar Pearl Metallic, <http://www.redrivercatalog.com/browse/66lb-polar-pearl-metallic-inkjet-photo-paper.html> & <http://www.redrivercatalog.com/cardshop/scored/66-polar-pearl-metallic-framecard.html>



When profiling with PS curves and this inkset, the red curve, controlling the cyan channel (LC and C), is used to adjust the Lab L (luminance or relative density). The green curve controls the Light Magenta ink, which is the primary toner. The blue curve controls the yellow ink, which was used here just to offset shadows that were otherwise too cool. All curves must go to the black corner of the graph to turn on the black ink.

The *.acv curve used for the above has also been put into an ICC with QTR’s “Create ICC-RGB.” This makes for a “color managed” workflow such that prints will automatically match the relative densities displayed on a calibrated monitor.⁶ The screen grab below of the Photoshop CS5 print dialog box shows how one pulls up the ICCs.



⁶ See <http://www.paulroark.com/BW-Info/1400-CL-2K2LK-Profiles.zip> for ICCs, *.acv curves and QTR profiles for this inkset.

In the Epson driver Properties (the “Print Settings” button above), I use the highest quality settings – Photo RPM and Not High Speed. The Color Management in the driver Properties box is set to ICM, with “No Color Adjustment” checked. ICCs made with QTR’s Create ICC-RGB always start with “QTR.” After that I put the printer name, then inkst (here “CL-2K2LK”), paper profiled (here the Red River Polar Pearl Metallic), and finally any settings that may be needed in the Epson driver. (Here Premium Luster paper type setting was used, although I see little difference among the Premium or Ultra Premium glossy paper types.)

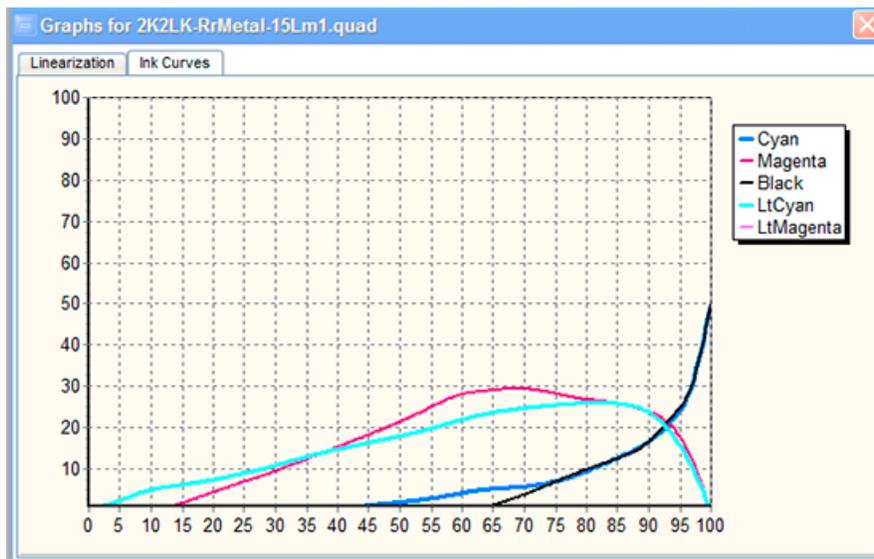
Sometimes I use the Photoshop curves without an ICC, with the Profile in the Print box being Adobe RGB. The reason for this is that I can then use, for example, a neutral curve for the image area, and a light yellow curve for the paper border. I separate the areas with selections. The yellow tones down the optical brightening agents (OBAs) on the borders of the paper, avoiding the eye from being drawn out of the picture and also avoiding having natural paper in the area from looking yellow in comparison.

QuadToneRip (QTR)⁷ Workflow

While the Epson driver is convenient, fast, and necessary where I’m toning down OBAs, QTR allows optimal use of the 4 neutral inks, resulting in outstanding print quality.

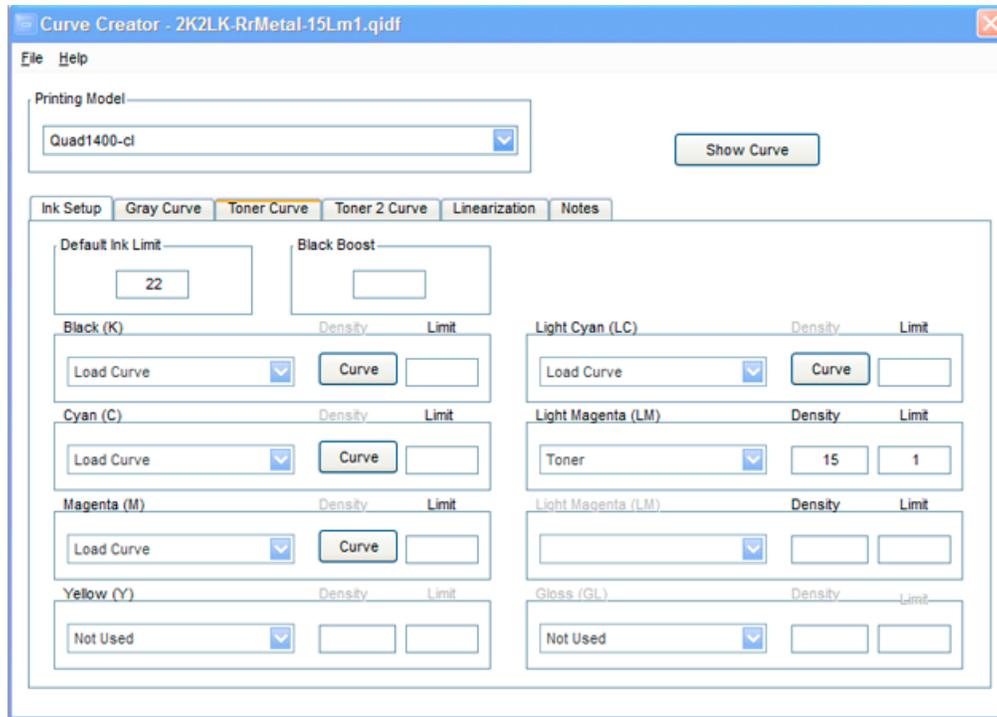
I use Windows. The Windows workflow and interfaces are different than that of Macs.

I have manually drawn a basic gray-black core curve that should work well, with ink limits modified as needed, for most papers. The basic approach sequentially starts the inks and has the LKs cross over to the Ks in the usual manner. Here the ink limit was set to 100 to show the curves. The actually ink limit for this paper (Red River Polar Pearl Metallic) is 22.



The screen shot below shows the ink setup for this.

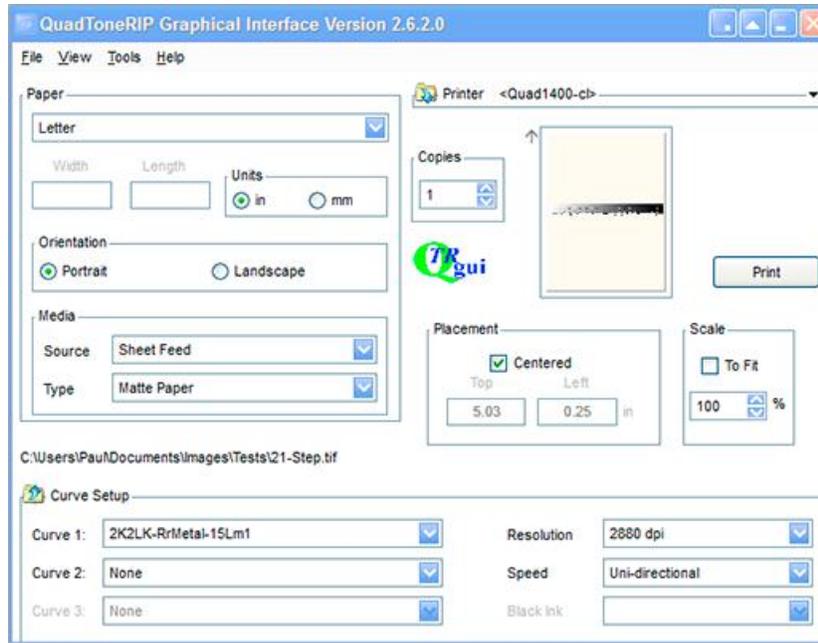
⁷ See <http://www.quadtonerip.com/html/QTRoverview.html>



The gray (M and LC) and black (K and C) inks have manually drawn curves. What will change from paper to paper is the ink load. Many of the papers will be close, but the first thing to check with a new paper is where the d_{max} is reached. There are curves included that help determine this.

The primary toner for a neutral tone will be the LM ink. The “Density” box in the QTR Curve Creator determines where the toner ink curve reaches its maximum. A higher Density moves it to the right – toward the black end of the scale. A lower density moves the peak of the toner curve to the left, toward the lighter tones. The ink limit determines the height of the toner curve. So little toner is used that these adjustments can be made without the need to re-linearize the paper.

The next screen grab shows the settings used when printing QTR. I always use the top quality settings.



I have been including in the name of the profile not only the inkset and paper used, but also the toner settings. Here profile “2K2LK-RrMetal-15Lm1” indicates that is it this inkset with Red River Metallic paper (Polar Pearl Metallic) and the LM toner set to a Density of 15 and an ink load of 1. It is easy to change in the ink load and save the new profile with a new name that indicates the extent of LM used.

There is no better setup for the most stunning B&W glossy prints.



[All donations to the cause of free inkset designs and profiles are appreciated.](#)

Enjoy,

Paul

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