

# MIS Ultra-Tone R2 B&W INKS for the Epson R220 Printer

## Information and Settings

By  
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This B&W printing approach uses the Epson R220 (or 340 now that the 220 is scarce) with dedicated B&W carbon-based inks sold by MIS Associates. This affordable but modern hextone (6-ink) printer can produce 8x10 prints that are visually equal to those made by the most expensive systems.

There are 2 alternative printing workflows described here.

First, the Epson driver alone can make excellent prints, utilizing the driver's "Color Controls" to adjust for different papers. Any application can print with this approach.

Second, the Epson driver in conjunction with ICCs provides an even more powerful "Color Managed" printing workflow. Adobe Photoshop Elements 4 (\$50 on eBay and all most will need) and Photoshop CS2, as well as the older versions of these programs, utilize a Print Preview that allows the ICCs to be inserted as one prints from a standard grayscale image file. This approach, among other things, provides an easy method to "linearization" systems and profile new papers. ICCs have been posted that were created by me using Roy Harrington's "Create ICC" program. For those with a spectrophotometer, the Create ICC program, which is part of the \$50 QTR package, allows one to easily make these ICCs. See <http://www.quadtonerip.com/html/QTRiccprofile.html>.

## UT-R2 Inks

The MIS UT-R2 inksets come in 2 tones: R2-N (neutral) and R2-Warm (pure carbon). Both are 100% pigment (no dyes), black and white inksets for the Epson R200 and R220 printers. They can be purchased from MIS Associates. See the MIS website at: <http://www.inksupply.com/bw/utr2>

While the inks are the same, the recommended settings for the R220 are different than those for the R200. The R220 ICCs will not work correctly on the R200.

In my fade tests the MIS UT family of B&W inks, which includes these R2 inks, is very lightfast. However, the color inks that are used to cool the warm carbon base inks will fade

faster and at different rates. This will cause a tone shift in the print. The most lightfast prints are 100% carbon. The UT-R2 warm inks are 100% carbon. The neutral inks have color added to the carbon.

The UT-R2 inksets can print on matte or glossy papers as long as the appropriate black ink is installed. MIS **Eboni** black is **for matte papers**. A special **Photo Black (R2-PKN) for glossy papers** has been formulated specifically for the R200 and R220 printers.

The tones of the images printed with the R220 can be varied from neutral to warm by installing different combinations of the R2-N and R2-W cartridges. Different papers also print with different tones. Note that the inks in the cyan and magenta positions are the same density. Likewise, the LC, LM, and Y position inks are all the same density. The chips, however, are specific to each ink position. So if you want to warm up a “neutral” set slightly, try putting an EZ-Warm yellow cart in the yellow position.

## Settings

### 1. Photoshop “Color Settings”

The default settings of most Windows computers are probably where you want to be. As such, unless there is a problem this section can be skipped.

These color space settings affect how the image is displayed on the monitor and, in a color managed workflow such as when an ICC is used, they also affect how the image is printed. As a practical matter the first two options use working space Gray Gamma 2.2, which displays the image slightly darker and, likewise, prints the image darker when an ICC is used. The third option uses Dot Gain 20% and displays the image slightly lighter. When an ICC is used the print will also be lighter. In non-color-managed workflows, such as when the driver “color controls” are used with no ICC, these settings do not affect the print, but they can be useful in helping to match the monitor view to the print.

Adobe’s Photoshop (“PS”) Elements 4 and PS CS2 have similar controls (Edit>Color Settings), but the Elements 4 format is simplified and easier. I recommend Elements 4 as the image editing program for most people. The main advantage of full PS CS2 for B&W printers is its greater 16-bit file handling capabilities. Elements 4’s 16-bit handling is similar to where the full PS programs were several versions ago. However, due to the dramatic price difference and more elegant Color Management handling by Elements, I’ll use it as the standard here.

When one clicks on Edit and Color Settings, a box with 4 options appears. These options, however, amount to 2 basic choices. The first 2 options print slightly darker; the third option prints slightly lighter.

1. **No Color Management** – When files are opened after this selection has been made, any embedded profiles are taken off the file. The source space in the Print Preview

becomes “**Untagged Gray.**” The monitor view and printing on my system are the *same as* with the second option, discussed below, probably because *Gray Gamma 2.2* is the usual default space, including for my Windows XP system.

**2. Optimize the image for Computer Screens** – This option uses working space **Gray Gamma 2.2**. This appears to be the most common default standard and is used by the *Web*. With this setting one gets a *slightly darker* monitor image and print, with somewhat *compressed shadow tones*. In the darkroom days, it would have been said to have a “*long toe*” characteristic curve. Gamma 2.2 is said to match our visual response closely and is used by most of the common color spaces like sRGB and Adobe RGB. I recommend this standard for most, in part, because it is such a wide spread standard.

**3. Optimize for Printing** – This is working space **Dot Gain 20%** and gives a *lighter image* with *more shadow separation*. In the darkroom days, it might have been considered a “*short toe*” characteristic curve. It is similar to the curves I used in the past and appears to be commonly used in the prepress industry. Images made with this setting will need further modification for posting on the web.

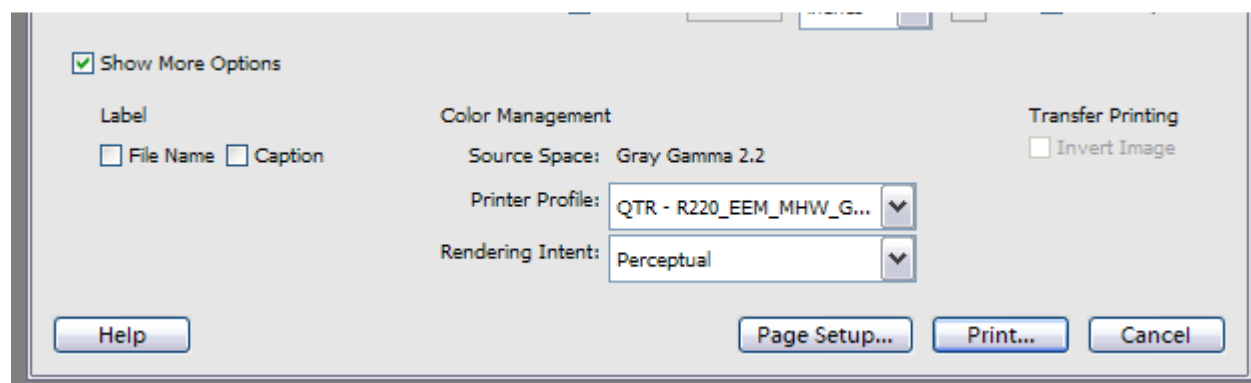
4. The final option assumes Gray Gamma 2.2 but allows No Color Management for files that do not have embedded Gray Gamma 2.2 profiles in them.

## 2. Photoshop Print Preview

The Print Preview is necessary only if the ICC method of printing is used. If the Epson driver alone is being used with no ICCs, this section can be skipped.

PS Elements 4 always utilizes a print preview. However, in Photoshop CS2 and older Elements versions one must click on a separate “Print with Preview” to have all the options available.

In the box that appears below the Preview image, check “Show More Options” (Select “Color Management” in full PS). The lower part of the Print Preview box will look like this – at least after an ICC is selected.



The following settings should appear if one is printing a grayscale file:

**Source Space:** Gray Gamma 2.2 (usual default space)

This is one of the easiest places to see what profile might be embedded in the file.  
(In this example, GG 2.2 – Elements 4 option 2 – was selected in “Color Settings.”)

**Printer Profile:** Here, different settings will be used depending on whether one is using an ICC or not.

**If no ICC** is used leave it at the default source space setting,  
Or set it to “Same as Source,” which is at the top of the list.  
(In PS CS use No Color Management.)

**If an ICC** is going to be used, this is where it is selected.  
Click on the arrow to see the list. The ICCs I’ve made will start with  
“QTR” and be near the bottom of the alphabetical list.  
Select the ICC with the printer and paper name of choice.  
Note the driver settings for media type and Gamma in the ICC name.  
These driver Properties need to be set correctly in the next step.

(In PS CS select “Let Photoshop Determine Colors.”  
Then load the ICC from the list.)

**Rendering Intent:** Perceptual (or grayed out if in ICC is going to be used)  
(Black Point Compensation checked in PS CS)

Click on Print to proceed to the Epson driver.

### 3. Epson Driver Properties Settings

Be sure the driver is loaded from an Epson disk or downloaded from the Epson webpage.  
The drivers that are built into Windows are not complete.

Go to “**Properties**” and “**Advanced**.” In that box the settings will vary with the type of paper being used.

The gamma settings in this box, as well as the sliders, allow some control over how the print will look. The settings below are recommended starting points for the most popular matte and glossy papers. When you get settings that give the results you like, I recommend that you save those.

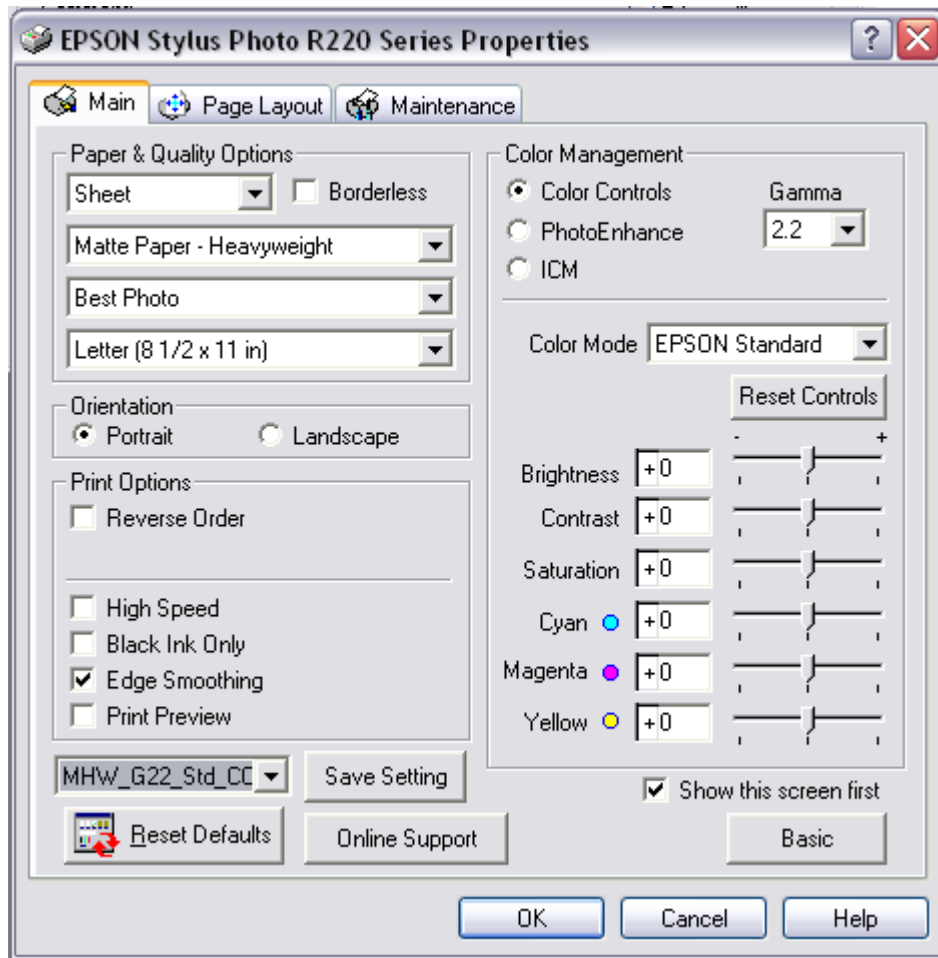
Where an ICC is used, that ICC was made with and for specific driver properties settings. The settings are stated below, and are the same as when no ICC is used unless otherwise stated. The most important settings are also noted in the ICC names. To download ICCs go to [http://www.paulroark.com/BW-Info/R220\\_UT-R2\\_ICC\\_Download.html](http://www.paulroark.com/BW-Info/R220_UT-R2_ICC_Download.html) For more on ICCs, see section c. below.

Although many different papers will print well with this printer and inkset I recommend starting with the papers and settings listed first, below, to learn what the printer is capable of and to hold down the variables.

To test new or different papers, I recommend the use of 21-step test files such as I have on my web site. (See the index at <http://www.paulroark.com/BW-Info/index.htm> .) Printing these test files will show whether the grayscale ramp is reasonably “linear” (evenly spaced 5% steps) and help in determining the best slider settings for new papers. (Expect the 90% to 100% spaces to look about the same with the default Gray Gamma working space.)

### **a. Printing on Matte Papers**

For most matte papers, start with these settings, whether or not an ICC is used:



The usual matte paper settings that make the most difference are listed below. Assume these settings unless stated otherwise.

Paper type – Matte Paper – Heavyweight (“MHW”)

(If the deepest blacks look glazed, try a paper type that puts less ink on the paper, like “Photo Quality Ink Jet Paper.”)

Best Photo

High Speed – OFF

Black ink Only – OFF

Color Management –

Color Controls checked

Gamma 2.2 (Try 1.8 if the print is too dark.)

Color Mode – Epson Standard

(The default “Vivid” setting often produces less smooth highlights)

Sliders – 0 (default)

(Where the driver alone is used, these tools might prove useful.)

**Epson Enhanced Matte (“EEM”)** is a good, inexpensive paper for drafts and images that do not need to be archival. It has a paper life of just over 100 years in good storage conditions according to the Wilhelm Research accelerated aging tests. In high humidity or temperature, it might yellow much more quickly. While this paper is not archival, it makes an excellent image and is a good value for non-archival printing.

**Hahnemuhle Photo Rag** has traditionally had the highest dmax and one of the nicest finishes of any smooth matte rag paper. It tends to have some flaking (which is typical; blow off the surface before printing) and a sensitive surface. With no ICC and driver Gamma 1.8 it prints very close to the traditional open-shadow ramp I’ve used for a long time. A file gray space of Dot Gain 20% fairly accurately displays this look. With a driver gamma of 2.2 it prints with a 50% patch at Lab 50 and a look closer to the monitor set at the default Gray Gamma 2.2. I’ve made ICCs for both of these driver settings.

**PermaJet Alpha** contains no optical brighteners, which gives it a slightly creamy look and avoids the appearance of yellowing that will happen over time with brightened papers. Alpha is one of my favorite papers, but, unfortunately, PermaJet currently has no distribution in the U.S. Related papers Omega and Delta print similarly and have some brighteners, with Delta being the brightest, but still neutral. These are excellent papers that exhibit little if any flaking. With no ICC, Photo Quality Ink Jet paper setting may be very slightly smoother than “MHW.” With an ICC, the “Ultra Premium Glossy Photo Paper” (“UPGPP”) setting gives a slightly higher dmax.

**PremierArt Fine Art Hot Press 205 (“PA 205”)** is an excellent value in archival cotton paper. The convex side of the 205 weight version prints slightly smoother than the concave side. The heavier PremierArt Fine Art papers and Epson UltraSmooth typically use the same settings. These papers have no optical brighteners, yet are still quite bright. They exhibit little or no flaking and may be the most archival and durable papers I’ve tested. MIS now carries PremierArt 205 paper, as do a number of other internet outlets. They print better with an ICC.

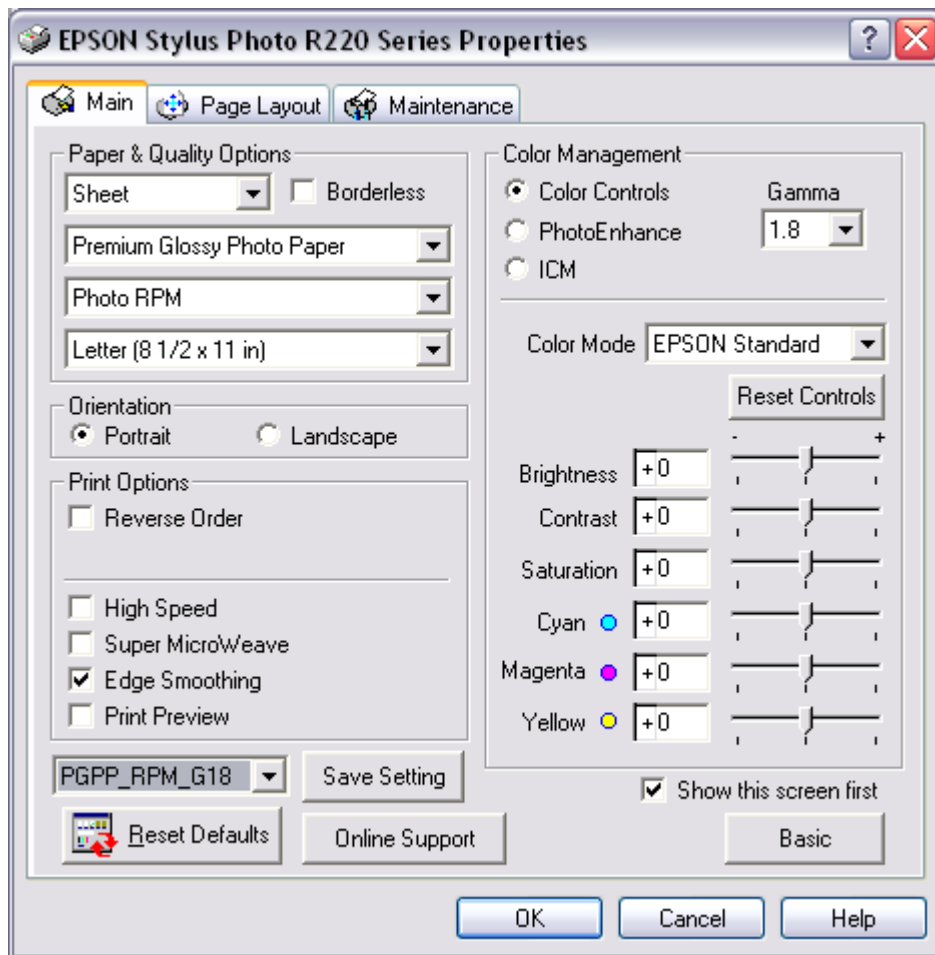
**Innova Photo Smooth High White Cotton** is available in 2 weights (and prices). While the name suggests a highly brightened coating, it is not – which is good from my perspective. With no ICC, use paper type setting Photo Quality Ink Jet paper (“PQIJ”). With an ICC, a slightly better dmax can be achieved with the “Ultra Premium Glossy Photo

Paper” (“UPGPP”) setting. (Continue to use the “Best” as opposed to “Photo RPM” setting.) Innova papers can be purchased at <http://www.shadesofpaper.com/> .

**Moab Entrada papers** are good value cotton papers. These papers suffer from some flaking and should be blown off before printing. The Moab Entrada Natural has no optical brightening agents (“OBAs”), and thus will not appear to yellow over time due to the OBAs burning out. The Entrada Bright White has lots of brighteners and prints cool. With no ICC a “Photo Quality Ink Jet” paper type setting may be smoother than the MHW setting. With an ICC Ultra Premium Glossy Photo Paper setting gives a bit higher dmax, but I have made ICCs for both this and PQIJ. In either case the dmax of these papers is at the low end of what I consider acceptable.

## **b. Printing on Glossy Papers with R2 Photo Black Installed**

The settings, below, work well for many papers. For the papers listed below, use these settings except where otherwise noted. The settings are the same whether or not an ICC is used, and the ICC Download page is the same as that above.



The usual glossy paper settings that make the most difference are:

Paper type – Premium Glossy Photo Paper (“PGPP”)

(With Epson papers, use their listed paper type.)

(If the blacks lack gloss or the midtones have dots, try a paper type that uses less ink, such as “Glossy Photo Paper.”)

Photo RPM (Slightly better dmax and slightly smoother than Best Photo)

High Speed – OFF

Super MicroWeave – OFF usually works well and is faster

Color Management –

Color Controls checked

Gamma 1.8 (2.2 will be darker, 1.5 lighter)

Color Mode – Epson Standard

Sliders – 0 (default)

**Kirkland Glossy Photo Paper** deserves special mention. It is the cheapest and perhaps the best glossy letter size paper. It can be purchased on line by anyone, even if not a Costco member. (May be out of stock on line.)

**Epson Premium Glossy Photo Paper (“PGPP”)** has the highest Wilhelm Research longevity rating of any gloss paper, with a dark storage life estimated at “>300” years.

**Epson Premium Semigloss (“PSG”)**, rated by Wilhelm at “>200” years in terms of storage life, is one of the few glossy papers with no optical brighteners. Use the above settings except that the paper type should be “Premium Semigloss Photo Paper.”

**Iford Galerie Smooth Pearl** is a popular and reasonably priced paper. Typical of the vast majority of glossy papers, it does not appear to be acid free or archival. Like PSG, above, it uses the usual settings but with the Premium Semigloss paper type setting.

### c. Printing with an ICC

An ICC is a small file that can be downloaded or made and is put in the folder: c:\windows\system32\spool\drivers\color\. When printing, it is inserted in the Print Preview step of Photoshop or PS Elements. These files tap into the Color Management systems of these programs and allow for quite consistent printing among different papers and printers. The view on the monitor should also be close to what the printer produces. Standard ICCs are or will be posted for a number of papers, and custom ICCs can be made by anyone with the equipment and Roy Harrington’s Create ICC program.

The driver settings are generally listed in the name of the ICC and are usually the same as if no ICC is used. Sometimes there will be two ICCs with different settings, such as the driver gamma setting. In theory a matte print using Dot Gain 20% (lighter) might benefit from an ICC that uses the lighter (gamma 1.8) driver setting. So far, I have not seen differences, however.

To download ICCs go to [http://www.paulroark.com/BW-Info/R220\\_UT-R2\\_ICC\\_Download.html](http://www.paulroark.com/BW-Info/R220_UT-R2_ICC_Download.html)

For a tutorial on making your own ICCs with a flatbed scanner, see [http://www.paulroark.com/BW-Info/Making\\_B-W\\_ICCs.htm](http://www.paulroark.com/BW-Info/Making_B-W_ICCs.htm) .

## Note on Protective Sprays

I spray many of my best glossy-paper prints with PremierArt Print Shield after they are dry. In the past this was needed to eliminate the “bronzing” (differential color reflections) that seriously afflicted most glossy papers with other inksets. However, the current MIS UT inks have such low bronzing that most will probably not see any need for this now.

Spraying also increases the dmax makes the surface of the print waterproof. Once sprayed, the print surface is tough enough to be cleaned with a damp paper towel if need be. I sometimes display sprayed glossy (including semi-gloss and semi-matte) papers with no glass, so that the full dynamic range of the image, including particularly the depth of the deep blacks, can be seen without the compromising effects of glass reflections. Spraying for these purposes still has value.

For my index of other printing information, go to <http://www.paulroark.com/BW-Info/index.htm>

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Paul

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For a B&W printing forum where I hang out, see <http://groups.yahoo.com/group/DigitalBlackandWhiteThePrint/>