Large Format Printer (8x10 and 11x14) Instructions
Targets can be reduced to narrower widths if necessary – see Appendix A.

Table of Contents

If you downloaded one of our printer-specific profiling kits, please refer to the appropriate Appendix for further details.

Introduction and Setup

Thank you for selecting our custom profiling service. We endeavor to provide the most accurate printer profiles possible. These instructions are comprehensive because the better your printer is set up, the better the profiles will work for you. We want to extract every possible bit of performance from your printer; this document is an aid towards that end. If you have questions at any stage of the process, please contact us.

Please fill out the Profile Order Form and submit it with your targets and payment. This document is a guide to optimizing and evaluating your printer, printing our profiling target, and using profiles. We typically measure your targets and make the profiles within two business days of when we receive the target prints. If you have any questions, please do not hesitate to contact us. Contact information is included on the final page.

At the risk of turning away business, first make sure that custom printer profiles are what you need. If your computer does not have a calibrated monitor, please do not invest in printer profiles yet! You need to be able to trust what your monitor shows before worrying about how the results look in print. You can calibrate your monitor visually, or for far better results, use a dedicated hardware calibrator. Our web site contains calibration tips and reviews of several popular calibration systems. Printer profiles are also tuned to a calibrated viewing system – usually a D50 light booth – although we can optimize the profiles for other viewing conditions as well.

Our profiles are intended for color printing. They give very good results for B&W work, however obtaining perfectly neutral black and white output from a color printer while possible, can require extensive print iterations. Our profiles will get you close to perfect. If, however, the majority of your work is true B&W prints, we suggest purchasing a dedicated monochrome printer.

Profile Target Descriptions

Our profiling kit contains several targets. The first is a small 3x5" target (DCP-PrintEval.tif) designed to help optimize your printer setup. The other, larger targets are the ones we measure to make your profiles. You need to send us print(s) from the large target. Sending the small printer setup target is optional, but helps us identify any potential issues with your printer setup.

Our profile targets are saved as TIFF format images. There are two versions, summarized in the table below. (Note: Printer-specific target downloads only contain one file size). You only need to print one version – the two sizes are provided to allow printing the most convenient format for you.

Both target versions contain approximately 1100 color patches. The 8x10 targets require printing three pages, while the 11x14 target fits on a single page. The targets were developed from our analysis of profile target prints from thousands of RGB printers and papers. Two thirds of the target are devoted to overall color rendition, while the remaining third is used for gray scale optimization and improved highlight and shadow rendering. The overall balance of the target is carefully maintained to avoid profile color space distortions. This target contains more data than is used by most profiling companies, requiring more work on our end, but we believe you will notice the difference in the profiles.

Both versions of the targets contain identical color information, so print the size that is most convenient for you. The 8x10 target can be printed on larger (e.g. 8.5x11 or A4) paper sheets as long as the target images are not resized. You do not need to trim the target down unless it makes it easier for mailing. We will trim as needed.

Target Size (inches)	Number of pages	Target Filename(s)
11x14	1	DCP-11x14.tif
8x10	3	DCP-8x10-p[1-3].tif

Printer profiling targets – pick the most convenient format.
Only print one size per paper type.

If your printer does not print up to 8 inches wide, the targets can be cropped in width. This must be done carefully to avoid corrupting the color data and scan features. Detailed target sizing instructions are given in Appendix A.

Additional printer specific targets are available from our web site. These targets have been specially formatted for the individual printers. We have targets available for all Fuji Frontier, Agfa d-Lab, and both Noritsu Laser (model 3xxx) and MLVA (model 2xxx) digital printers. Instructions on the use of these targets appears in Appendix B and C.

The file resolution for the targets (except Noritsu and Agfa models) is 300 ppi. If you absolutely must change the resolution of the profiling target file to support your printer, you can do so, although you should avoid this if possible. In the Photoshop Image Size dialog box, select the "Nearest Neighbor" resampling method. Do not use either bilinear or bicubic sampling! This will corrupt the colors in the image file. Again, please contact us if you have any questions. Complete instructions are provided in Appendix A.

The main color fields of each target are arranged in a carefully calculated, semi-random order. This is done to detect and compensate for angular print variances in optical printers and thermal cycle time limitations of dye-sublimation printers. A miniature version of the entire target with the colors sorted ordered in a more easily readable manner is printed in the margins of the first page of each target set. This gives a quick visual evaluation of your printer's performance.

Printer Optimization

For the best results, check your printer's performance using the printer evaluation target. This will ensure your printer is producing optimal output before printing the profiling target. The better your printer is set up, the better the profiles will be.

Before you begin the profiling process, make sure your printer is behaving properly:

- If the printer has a calibration routine, run it for the paper stock you are profiling.

- For inkjets, run a nozzle check, and ensure that all nozzles are clean and aligned before proceeding.

- Dye-sub printers should run an alignment check, and a densitometric or gray-balance calibration if available. The printer should be turned on for at least half an hour before printing the targets.

- Commercial printers (LightJet/Gretag, Durst, Chromira, Agfa, Noritsu, Fuji Frontier, etc.) should perform a full calibration cycle and run several test prints to ensure the machine is warmed up and stable.

Printer Evaluation Target

The next step is to print our 3x5" printer evaluation target (DCP-PrintEval.tif). This process is most useful for inkjet users needing to determine which media setting matches best with a third party paper. We highly recommend inkjet users print at least one copy.

For non-inkjet printers, or if you already know the appropriate media settings, this step is optional.

This target contains several features to aid you in evaluating your printer's performance. The size is small to allow it to be used with all format printers and so the target can be stored in a typical snapshot sleeve. For evaluation purposes, this target should not be re-scaled unless absolutely necessary. Like our profiling targets, the resolution is set to 300 ppi. If you need to change the resolution, use the nearest neighbor interpolation method in Photoshop.
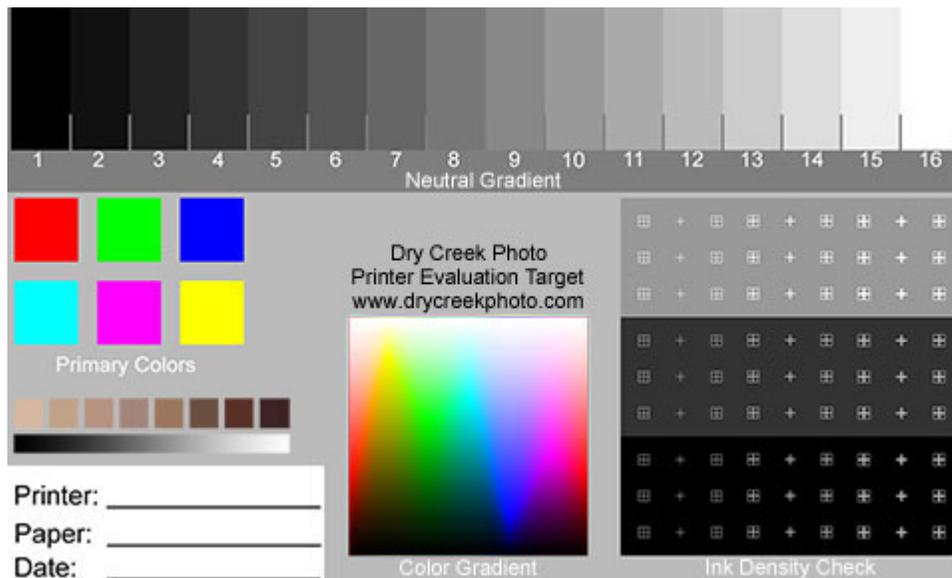
First, select the paper type in your print driver that most closely matches the paper you are printing on. This is critical for inkjet users, as the paper type determines ink limits and mixing of the black inks. Appendix E has pointers on finding the best media setting to use with third party media. Next, turn off any automatic color adjustments. This is required for accurate profiles, as automatic adjustments perform corrections based on image content. Unless you only want to print profiling targets, these corrections negate the profiles.

Select the highest quality printing mode. Inkjet users should decide what output resolution (e.g. 1440 or 2880 dpi) they will use most. There are very slight color differences between the modes, so the profile will work well for any mode, but will be optimized for the mode you select.

Inkjet users should typically select a manual color mode (Canon: Manual Color Adjustment, Epson: No Color Adjustment, HP: No Automatic Image Enhancement). On your initial print, look at the crosshairs in the Ink Density Check box. This is particularly important for inkjet printers. Ideally, all the crosshairs should be visible. Significant filling in of the crosshairs indicates too much ink is being dumped on the paper. If your printer driver allows adjusting the ink volume (sometimes labeled intensity), try reducing it slightly. If you are using a non-OEM paper stock, try changing the paper type in the driver setting. This will change the ink deposition volume as well. On inkjet printers, some ink filling is expected on the finest crosshairs. No ink fill indicates you could benefit from slightly higher ink density.

If you are using third party papers with an inkjet printer, particularly Epson models, check the grayscale gradient. The lower steps may all be black. If so, try another media setting. There often is no option that gives separation between steps 1 and 2. Choose a media setting that provides the best shadow resolution.

Next, look at the black area. Ink pooling, paper warping, or very slow drying also indicate too much ink. If you are using a third party paper, try changing the media type. If you use a RIP that allows control over ink limiting, careful adjustment here can improve shadow details immensely.

Now, examine the rest of the target. Do not worry if the color primaries do not appear as they do on-screen. Without using spot colors, few printers are capable of reproducing fully saturated colors exactly. In general, the Cyan, Magenta, and Green color will darken significantly. If you see banding, print dropouts, or splotches, run a printer cleaning cycle.

If the overall gray background is uneven, this indicates that either the printer or paper is of poor quality. If acceptable results are obtainable on a different paper, the paper stock is at fault. Profiles of low quality papers will not produce good results – save your money.

The Color Gradient contains the full range of color your printer can produce. It is normal to see gaps in this gradient. These are colors that your printer can not recreate. The profile will help smooth out any discontinuities or banding, but will not invent new colors for your printer.

To use the printer evaluation target to discover which inkjet media setting gives the best print quality, use the image placement options in either Photoshop or the printer driver to print the target in the upper left corner of a page. Switch to a different media setting, move the evaluation target print location to the upper right and print again. Multiple versions can be printed on a single page to help decide which media setting gives the best results.

Epson Specific Instructions

If more than the first two steps of the Neutral gradient in our printer evaluation target are indistinguishably black, you probably will have poor shadow detail resolution. For Epson printers, this can occur with the "No Color Adjustment" mode. If so, you have a choice to make. For the widest color gamut, "No Color Adjustment" is necessary. For the most linear gray scales, select the "Color Controls" option. In general, prints made with "No Color Adjustment" have more range, but if the best shadow detail is more important than a wide color range, select "Color Controls" for the printing option.

For all Epson printers:
- Disable High Speed mode for best quality
- Do not select Epson Natural Color (Macintosh) or Epson Vivid Color (Windows).
- Disable Edge Smoothing (if available).

Wide format Epson printers: Use No Color Adjustments for all printing; the ink output of these printers is more linear than with the desktop models. The image below highlights these settings. Remember to select the correct paper type!
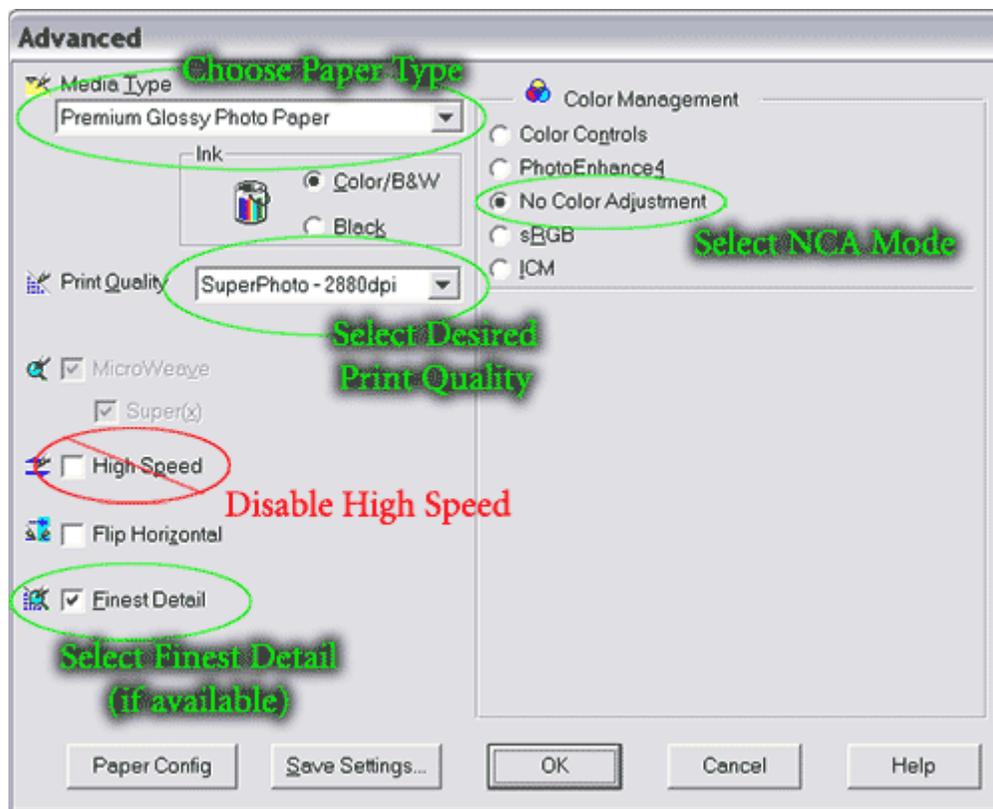
Epson Advanced Preferences

Note: Choose the print quality you care about most. The profile will be optimized for this output dpi, but will still be very accurate for other resolutions as well. There is negligible color difference on Epson printers between 1440 and 2880 dpi output. Accurate 720 dpi printing, however, requires a different printer profile.

Epson 2200/2100 and more recent printers (Epson 4000, R800, etc): Use "No Color Adjustments" mode. The 2100/2200 driver is better controlled than previous Epson desktops. This is also true for other more recent models (printers released from 2003 and newer).

If you use an older version of the printer driver, follow the graphic above to select No Color Adjustments mode. The newer Epson drivers require a more convoluted approach, and differ between Windows and Mac implementations.

Epson Windows Driver Settings

In the Printing Preferences dialog:
1. Select "Best Photo Quality" if available (depends on paper type).
2. Select Paper Type.
3. Do not select PhotoEnhance.
4. Press Advanced to open the Advanced Options dialog.
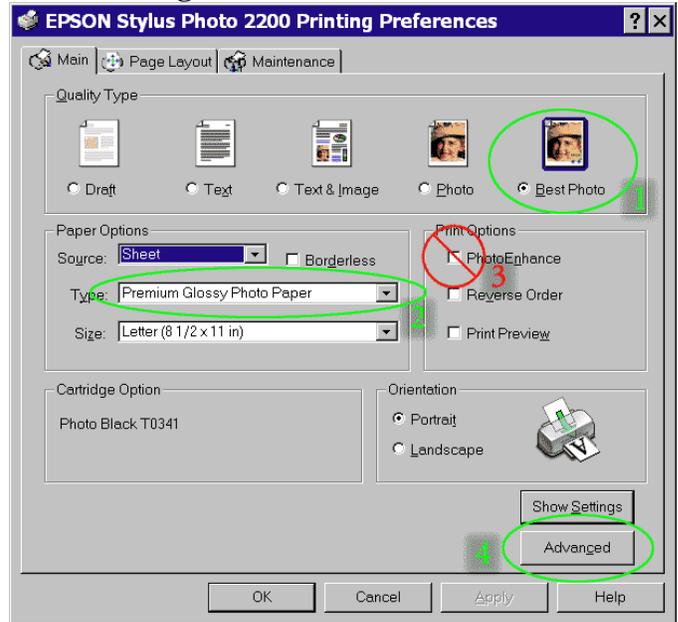
In the Advanced Settings dialog:
1. Select the resolution you most often use. Differences in color performance between 1440 and 2880 are minimal, so this setting is not critical. Note: the 720 dpi setting has significantly different color output, so it needs a separate profile.
2. Select ICM in the Color Management settings
3. Select No Color Adjustment in the ICC Profile settings (enabled after selecting ICM).
4. Do not select High Speed, Black Ink Only, or Edge Smoothing.
5. Save the settings with a name that you can remember. You will need to use this same setting when printing with your profile.

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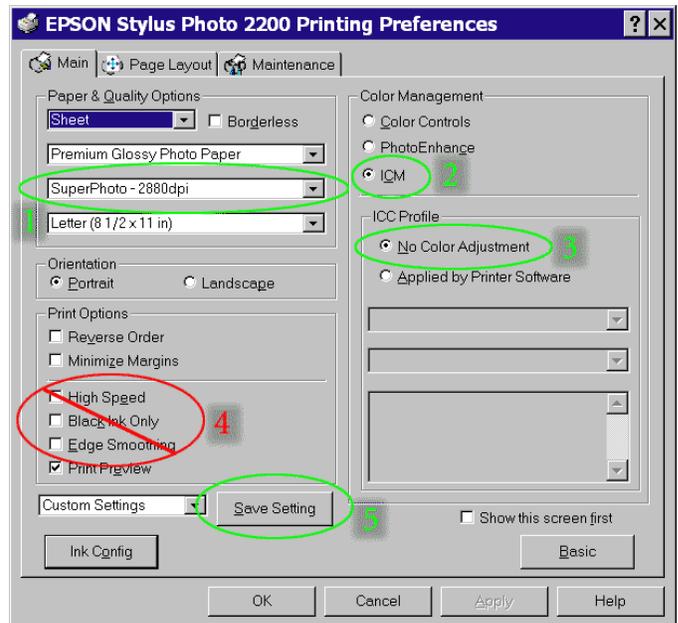
Epson Macintosh Driver Settings

In the Printing Preferences dialog:
1. Select Paper Type.
2. Select "Custom" mode.
3. Press Advanced to open the Advanced Options dialog.
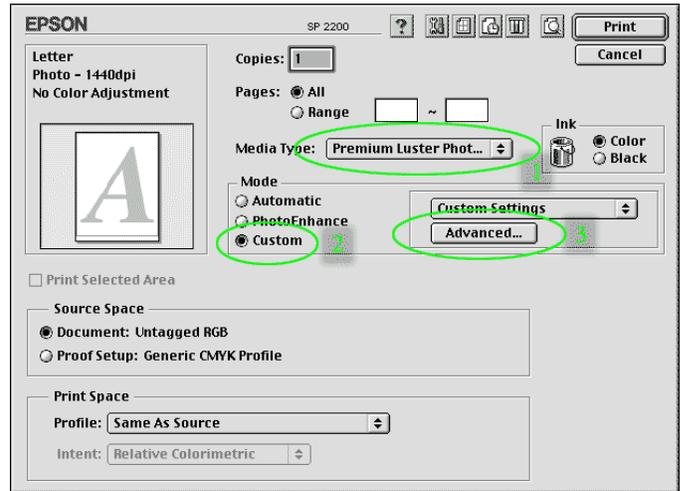
In the Advanced Settings dialog:
1. Select the resolution you most often use. Differences in color performance between 1440 and 2880 are minimal, so this setting is not critical. Note: the 720 dpi setting has significantly different color output, so it needs a separate profile.
2. Select No Color Adjustment in the Color Management settings.
3. Do not select High Speed.
4. Do not select Edge Smoothing.
5. Save the settings with a name that you can remember. You will need to use this same setting when printing with your profile.
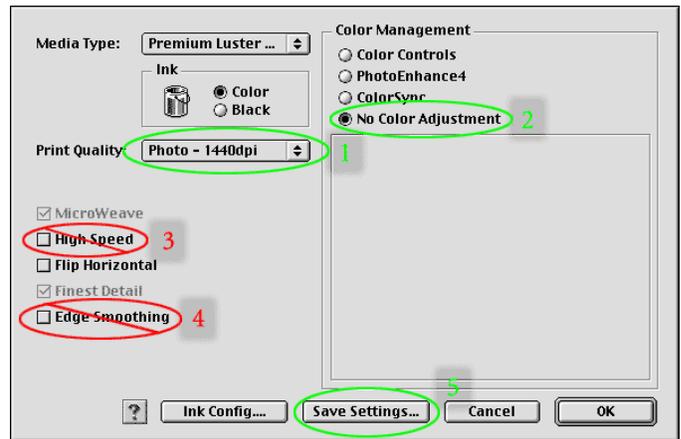
Epson R800, R1800 and Gloss Optimizer:
If you are going to use the gloss optimizer on a particular paper for your prints, enable it when printing the profiling targets as well. Several other profiling companies request the optimizer not be used because it throws off measurements on standard profiling equipment. We use a specialized setup for measuring these prints, and including the effects of the gloss optimizer coating gives you the best accuracy possible. You can reduce the usage of the gloss optimizer by selecting the "Auto" mode for printing the profile targets. This only sprays the coating over the image area rather than coating the entire page.
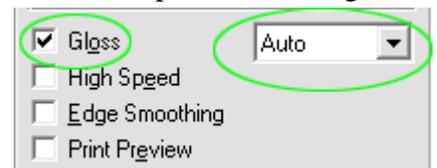
Epson 1270/80/90 printers: We strongly recommend using the "Color Controls" options for your profiles. The increased shadow resolution and linear output more than compensates for the reduction in color gamut. This is particularly true for matte finish papers. Access this option through the Advanced menu of your printer setup dialog. The figure below shows the Advanced menu choices. Select Color Controls, change gamma to 2.2 for best quality output, turn off high speed printing and change the brightness very slightly. If you leave brightness, contrast, and saturation all at zero, the printer driver may not use a consistent state. Increasing brightness by one point has no visible effect on image quality, but forces the Epson driver to store your changes.
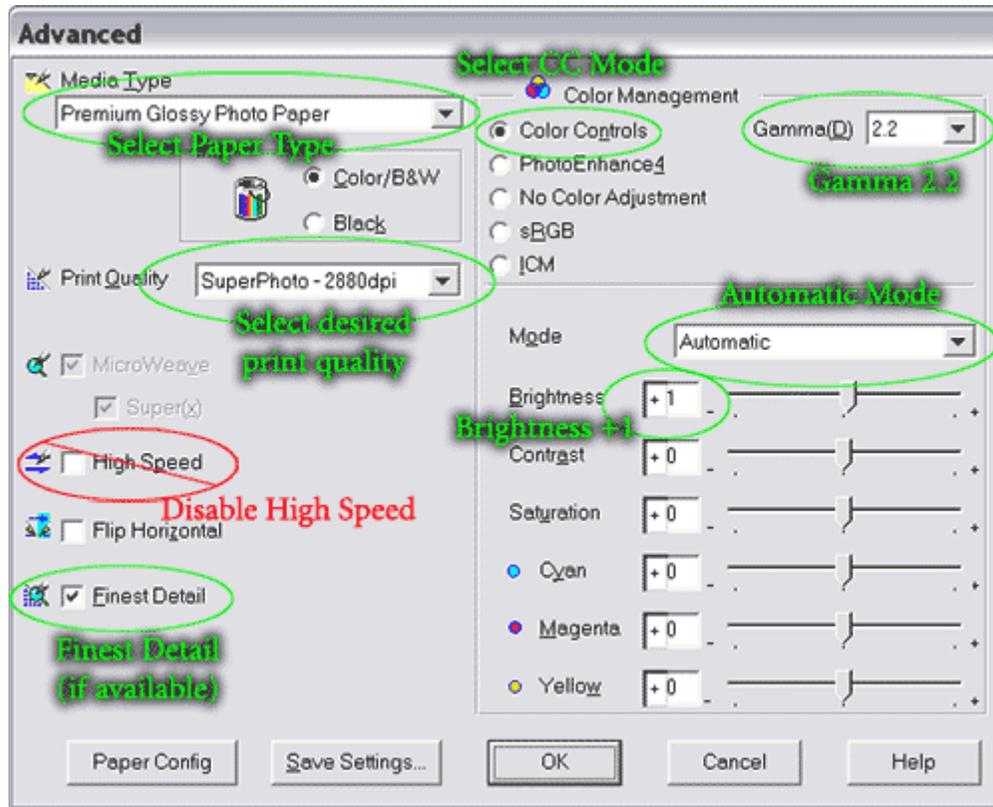
Epson Color Controls Settings

Epson 1270/80/90 printers with third party inks: This is a difficult situation. Most third party inks, advertising claims aside, do not have as wide a color gamut (have less saturation range) than do the Epson OEM inks. A custom profile will not improve the ink saturation – that is a function of the ink itself. Using the Color Controls mode recommended above truncates this range even more, often resulting in flat, low contrast colors (particularly dark browns and greens). The No Color Adjustments mode makes posterization and banding more likely in shadow areas. This is particularly true of third party pigment inks. Pick the setting that looks the least bad and go from there. Sorry, but we simply have not seen many third party ink options for these printers capable of producing output quality that we are satisfied with.

Save the settings with a sensible name. You will need to save individual settings for each paper type you plan to use. Use these settings to print the profile target, and when you print files using the profiles we create for you.

Canon Specific Instructions

Setting up Canon printers is more straightforward, but varies between Windows and Macs. The step numbers below refer to the screen shots on the following page. The screen shots are for the Windows driver; the Mac version is similar with some naming variations.

Windows:
- Main settings tab:
    (1) Select the appropriate media type. If there is not an exact match, either select the closest paper type or follow the printer optimization instructions above.
    (2) Select "Custom" Print Quality.
        ▪ Choose the print quality setting you wish to use.
        ▪ Set the halftoning to Diffusion.
    (3) Select Manual Color Adjustment.
        ▪ Set all sliders to 0.
        ▪ Turn off ICM.
        ▪ Set Print Type to "None".
        ▪ **Note: The above two settings are critical.** Missing one or both is the cause of the majority of the problems we see with Canon profiling targets. If your driver does not offer the "None" setting for the print type, please download the latest driver from Canon.
        ▪ Set Brightness to "Normal".
- Effects Tab:
    o Turn all effects off.
- Profiles tab (Note: These are printer settings, not Icc profiles):
   o Save your settings with a sensible name. This is what you will use when printing with the profile.

Mac:
- Print Dialog box:
    o Select the media type. If there is not an exact match, either select the closest paper type or follow the printer optimization instructions above.
    o Click the Details button.
- Detailed Settings Dialog:
    o Select the print quality you want.
    o Select Diffusion halftoning.
    o Select the Special Effects button and disable all the effects.
    o Click the Color (or Manual for some drivers) button.
        ▪ Set Color Correction to None.
        ▪ Set all sliders to 0.
        ▪ Disable "Color Balance" if this option exists.
- Go back to the main Print Dialog box and click the Apply button to save your changes. Choose a sensible name, as this is the setting you will need to use when printing with the profile.

Canon Setup Screenshots
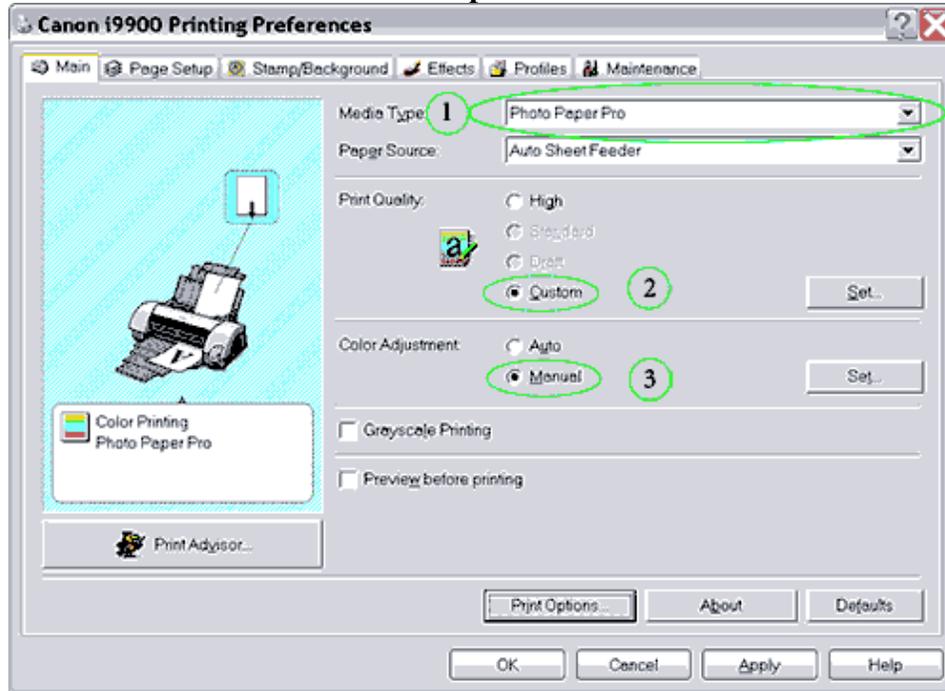
Printing Preferences: [1] Select paper type. [2] Choose "Custom" print quality. [3] Select Manual Color Adjustment.
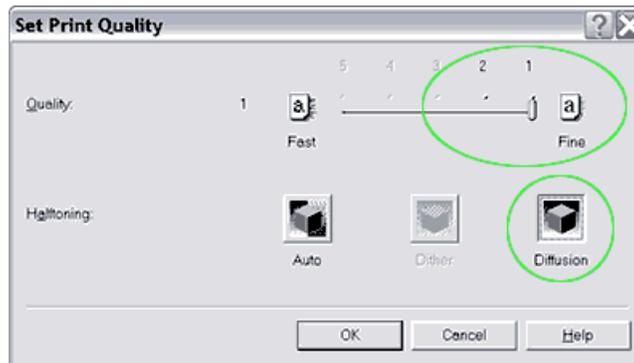
[2]: Print Quality: Choose best detail/quality and diffusion halftoning (if supported by media type).
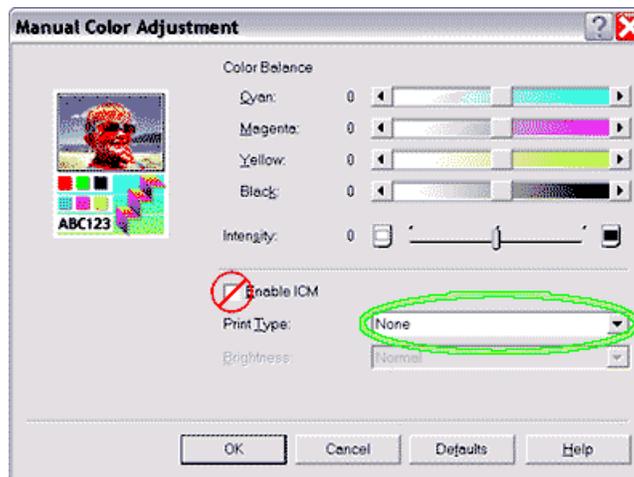
[3]: Color Adjustment: All sliders at 0, Enable ICM **not** checked, and Print Type set to "None".
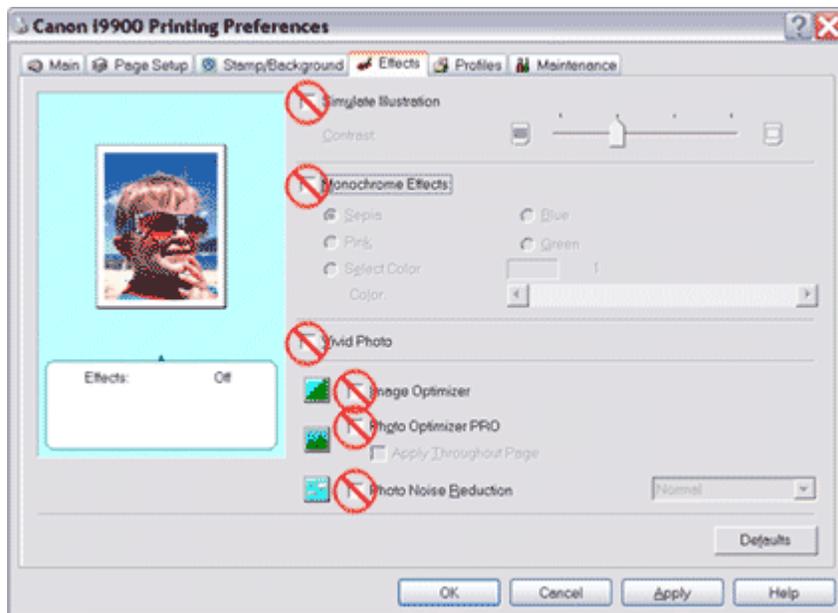
Effects tab: All effects OFF.

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HP Specific Instructions

DesignJet 130:

1. Select the appropriate paper type on the Paper/Quality tab of the Printing Preferences.
2. Choose "Best" printing mode – unless you want less than the best...
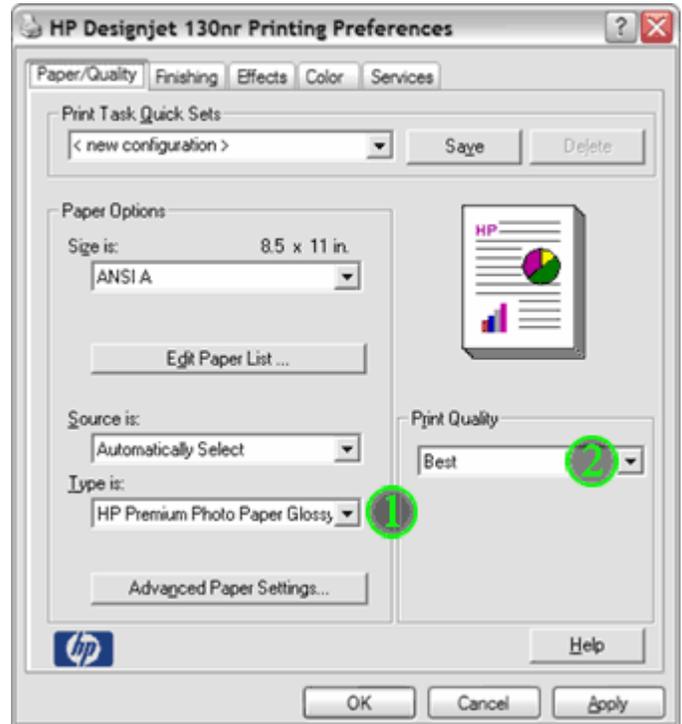
3. On the Color tab, select the "Manual" color output mode.
4. Choose "Managed by Application" as the color matching method.
5. Save the settings with a sensible name – you will use the same settings when printing actual images with the profile.
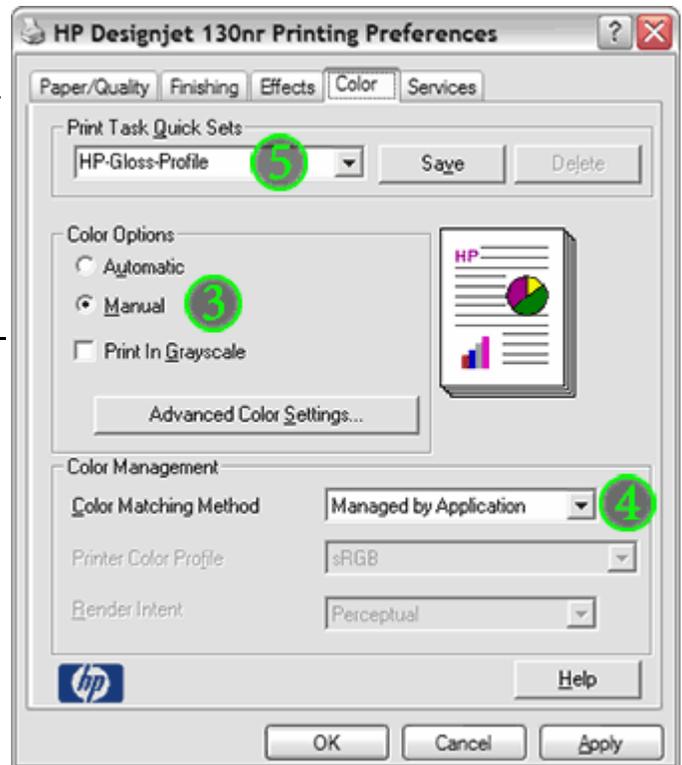
Older HP printers: Select the paper type and "Best" quality printing mode. Disable "Automatic Image Enhancement" on the Advanced tab:
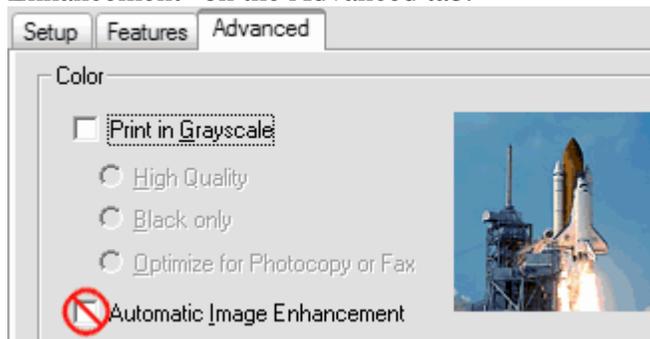
Printing the Profile Targets

At this point, you are ready to print the actual profiling targets. Save your printer settings! Every time you print using the profile you will need to use these same settings. Inkjet users, please run a nozzle check before printing the targets. Examine the printout carefully, using a loupe or magnifying glass if possible. If the nozzle check fails, please clear the printer before printing the profile targets.

Adobe Photoshop Instructions

If you open the image in Photoshop, ensure that it is not converted to a default working color space. If Photoshop gives a "Missing Profile" warning, select the "Leave as is (don't color manage)" option. If you get no such warning, please double check your Photoshop Color Settings (see below) to make sure the file is not being converted without your knowledge.
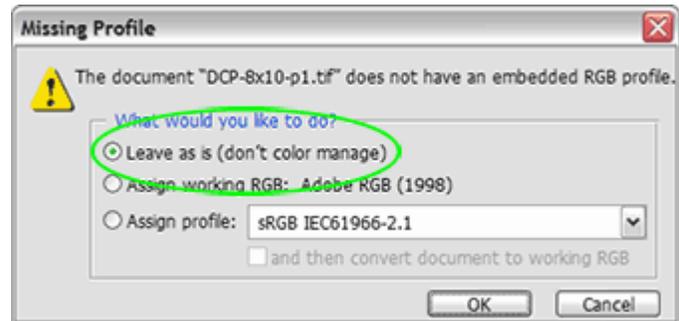
Photoshop Color Settings

If you are in doubt as to what Photoshop color settings to use, Adobe has an excellent, safe preset. In Photoshop CS2, it is called "North America Prepress 2". In previous versions of Photoshop, the settings are named "US Prepress Defaults." Don't worry if you are outside North America – the setup is a good one.

1. Choose preset here.

2. If you primarily use an RGB color space other than Adobe RGB (e.g. Pro Photo RGB or sRGB), choose it here.

3. If you use only one RGB color space, leave the "Ask When Opening" profile mismatch warning checked. If you use multiple RGB spaces, and the warning proves annoying, disable it. The other two warnings are vital to prevent Photoshop from performing color space conversions without your knowledge.
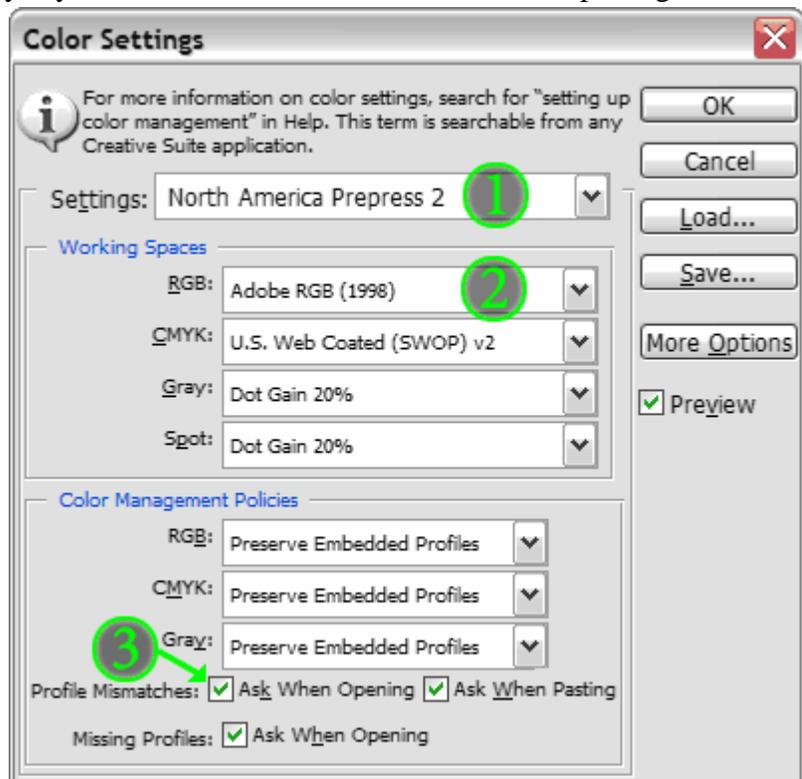
Photoshop Print Dialog Settings:

To print the file(s) from Photoshop, you need to ensure that no color management is being performed and that the image is printed without being resized in any way. In Photoshop 7 and newer, select File→Print With Preview. In Photoshop 6, the File→Print Options command brings up the same dialog box. You may need to click the "More Options" button (Photoshop CS2) or check the "Show More Options" box (previous versions) to see all the options.
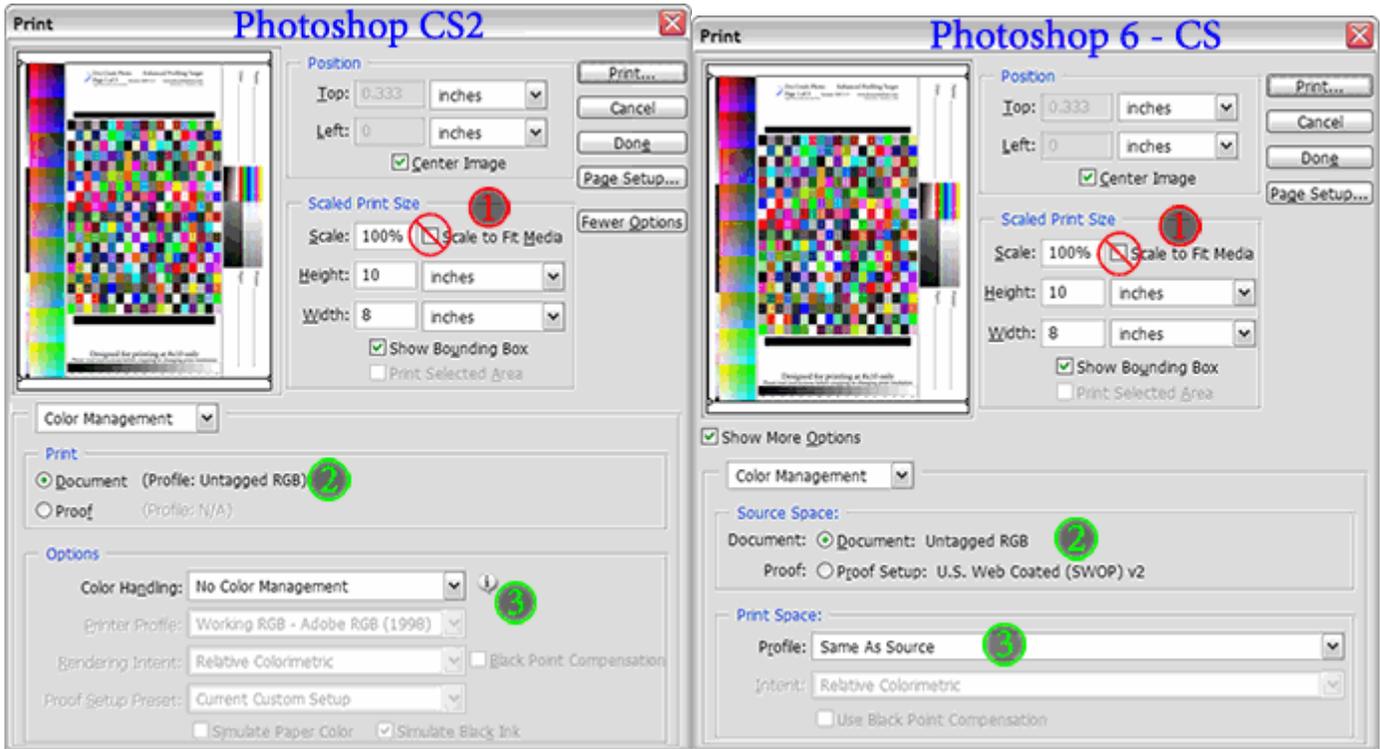

The critical parameters are the disabling of any color management and ensuring that the document is not scaled during printing. If you need to crop the width or otherwise rescale the target, please see Appendix A. Finally, make sure you have the correct paper orientation selected. All our profile targets are designed to print in Portrait orientation.

1. Make sure the Scale to Fit Media box is **not** checked. If it is, we may not be able to measure your targets accurately.

2. The Print parameters (CS2) or Source Space (Photoshop 6 through CS) must be set to "Untagged RGB". If you do not see this option, close the target image, re-open it, and ensure that you select "Don't color manage".

3. In Photoshop CS2, the output options must be set to "No Color Management". In earlier versions, choose "Same As Source" for the print space.

Other image editing applications have different terms for these options. The basic drill remains the same: Ensure the targets do not get a color space associated with them, turn off color management in the printer driver, and make sure the print is made without using profiles.

QImage Instructions

QImage is a popular Windows program for printing and basic editing. Our profiles work equally well in Photoshop or QImage – you do not need separate profiles for each program.

The key to printing profiling targets from QImage, however, is to disable the automatic image sizing QImage performs. Otherwise, the target sizes can be changed, making them difficult or impossible to read accurately. The settings below are *not* going to be the ones you use for normal printing. We need to turn off many of QImage's features to make sure the targets are sized correctly. Please use these settings. If the targets are misprinted there can be delays in processing or we may require new targets altogether.

The QImage interface changes often. These instructions are for Version 2005.301.

First, we need to prevent QImage from resizing the image. Ensure the image fitting button is down to force the "Crop to Size" option [1].

Check if a printer profile (anything in green type) is listed after the "Prtr ICC:" prompt. If so, left click on the profile name to toggle the setting to OFF [2]. Disable interpolation [3] and sharpening [4] as well. These must be done to preserve both the color information and page layout. Note: This only applies to printing the profile targets – for normal printing in QImage all sharpening and interpolation options are compatible with profile use.

Select the "Center Placement" option (top menu bar button, under the "Queue" or "Prints" menu item):
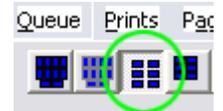
Turn off the Borderless Overspray/Expansion option. Otherwise, QImage can randomly resize images on certain printers.
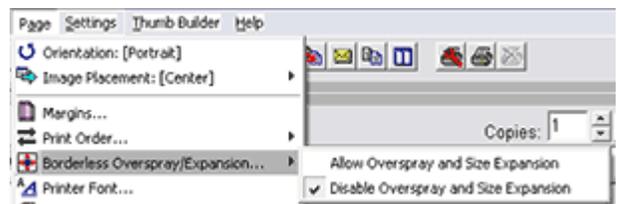
Finally, the page setup (Page→Edit Page) needs to be completed. Do **not** select a page size larger than your printer can print! Either choose an appropriate paper size from the defaults or enter the size you wish to use. Our targets are either 8x10 or 11x14 inches. The paper width (in portrait orientation) must be correct. Click the "Center" button. Ignore any warnings about exact centering being impossible – it does not matter for our purposes.
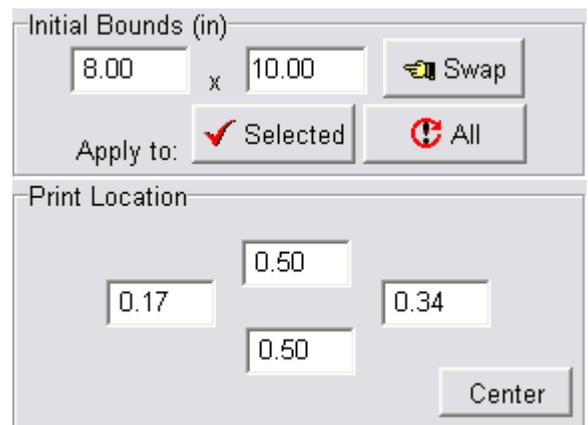
Print using the appropriate settings for your printer, with all color management disabled in the printer driver. See the sections above for suggestions and examples.

Shipping and Handling Instructions

Once you print the profiling targets, allow them to dry overnight in a dark location before mailing to us. This allows the ink to set and/or the paper to cure fully prior to the rigors of postal handling.

For inkjet targets, first let the prints sit for 30 minutes. Next, place a sheet of plain paper on top of each target print and store the prints at least overnight. The plain paper absorbs residual solvents that outgas from the inks and speeds drying. The next day, remove the plain paper sheets and discard. Separate prints with fresh sheets of clean paper, archival tissue, or enclose them in protective sleeves. Package the print(s) in a rigid envelope or tube.

Please, do not write on the back side of the target prints! The measurements will be adversely affected.

We recommend enclosing prints in plastic sleeves to prevent them from absorbing moisture from the air during shipping. This is particularly important for our overseas customers where shipping times can be longer.

After you receive your custom profile(s), print out a copy of the evaluation target on each paper stock you have a profile for. This time, print the target using your profile. Select the Relative Colorimetric rendering intent. Store the target in an archival sleeve in a dark place. When you change inks or ribbons, print out another evaluation target using the appropriate profile and Relative Colorimetric rendering. Let the target dry overnight, and compare the neutral steps along the top edge. If you see noticeable color differences, it is time for a new profile. For inkjet prints, it is important to wait before performing critical evaluations. Most inks and dyes require a curing period of at least several hours before the colors stabilize.

Installing Your Profiles

Your ICC printer profiles will be delivered by email. These are relatively large files, over 1MB apiece. Our profiles contain a great deal of data about how your printers behave, hence the size.

Before profiles can be used by applications such as Photoshop, they must be installed on your system. Windows and Mac OS/X users can simply drop the profiles in the appropriate folder. Users of Mac OS 9.x need to go through an additional step.

Profile locations – Install the profiles in the following directories, depending on your operating system:

- **Windows XP:** \Windows\system32\spool\drivers\color

- **Windows NT/2000:** \Winnt\system32\spool\drivers\color

    o The simplest way for Windows 2000 and XP users to install a profile is to right click on the file and choose "Install Profile".

    o If you are installing an updated profile that has the same name as the original, however, Windows **will** **not** actually install the updated profile. You must manually copy the profile to the correct directory.

- **Windows 98/ME:** \Windows\System\Color

- **Mac OS X:** Storing profiles in /Library/ColorSync/Profiles allows all users to use them. An alternative area, for users without Admin privileges, is /Users/<username>/Library/ColorSync/Profiles — any profiles stored here are available only to the current user.

- **Mac OS 9.x:** Systems Folder/ColorSync Profiles

    o To preserve the file formats across mailing systems, your profiles will be compressed in a Stuffit Archive. Many archive expanders read Stuffit files; you can download the free Stuffit reader from www.stuffit.com. Each file within the archive is encoded in BinHex format. Depending on your system setup, the profiles may be fully extracted, or you may need to the BinHex files through Stuffit again.

    o If the files extracted from the .sit archive have the extension ".icc", skip the next step.

    o If the extracted files have the extension ".hqx", drop the ".hqx" (BinHex) files on Stuffit again to fully extract the ".icc" (Icc Profile) files. This convoluted setup proved necessary to fully preserve the Mac resource fork information across mailing systems.

    o Install the profiles (".icc" files) on your system. You can either drop the profile on your System Folder and it will automatically be installed in the ColorSync folder, or you can open the System Folder and manually place the profiles in the ColorSync Profiles folder.

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Example Workflow for Using Profiles

Included below is a sample work flow for using ICC printer profiles taken from the tutorials on our web pages. It errs on the side of completeness, so do not be taken aback by the detailed steps.

1. If you have not already installed the profile(s) on your system, you need to do so before proceeding.
2. Open the image in Photoshop.
   - In Photoshop 7 and above, if you are presented with a profile mismatch dialog, select "Use the embedded profile". Do not let Photoshop convert the file upon opening. Without knowing what color space to convert from, this is asking for trouble.
   - In Photoshop 6, you have the option of assigning the correct profile when opening the file.
3. If you have a profile for your scanner or digital camera, you may need to assign it to the image. Most RAW file converters and scanning programs handle the conversion for you, so you can skip this step. Likewise, if you do not use camera or scanner profiles, skip this step.
   - Some products (notably Nikon Capture and Nikon Scan) require manual intervention. Assigning the profile (Edit→Assign Profile in Photoshop CS2; Image→Mode→Assign Profile in previous versions) tells Photoshop how to interpret the image colors.
   - Convert the image to a suitable editing color space. If you don't have other preferences, Adobe RGB is a reasonable choice. You do not want to edit the image in the device color space -- it describes how your camera or scanner sees the world, which does not translate into a well behaved editing space.
   - The conversion process can be turned into an action or droplet for automatic/batch processing.
4. Edit the image until you are happy and save the file. Do all your editing in a standard color space such as Adobe RGB or sRGB, not a printer profile. Editing color spaces are designed for editing. Printer color spaces are not. At this point you have an image that can be printed on any printer.
5. Make a duplicate of the image. This allows you to keep the original as a printer-independent version, which can then be formatted for any other output medium. We'll now work on the duplicate, and tune it to optimize the colors you get on your printer.

6. Now it is time to soft proof to see how the print will look. Choose the duplicate image, and select View→Proof Setup→Custom, and load the appropriate printer profile.
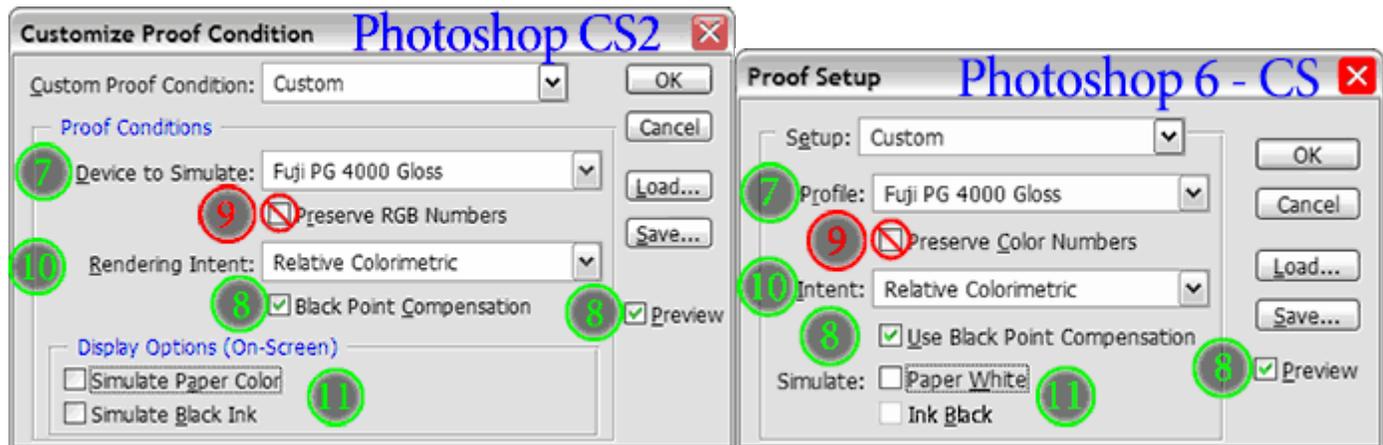
7. Select the profile to use from the drop-down list in the Proof Setup dialog box.
8. Check the Preview box and turn on Black Point Compensation to accurately scale the black level in your image to the printer's black.
9. Do **not** select Preserve RGB/Color Numbers. This shows how your image would look if you did not do a color space conversion — just the opposite of what you want.
10. Experiment with rendering intent. You can quickly switch between rendering intents in the Soft Proof dialog - just have the Preview option checked. Relative Colorimetric often gives the best results. Perceptual or Saturation can be better if your image contains many out-of-gamut colors. Absolute Colorimetric rendering is often used for mid-stage print proofing; if you are familiar with this, you don't need this document.
    o For most images Relative Colorimetric rendering produces superior results. For others, Perceptual will be far better. These cases include images with significant shadow details where a slight lightening of the print is acceptable to open up the shadows. Also images with areas of highly saturated color can benefit from Perceptual rendering. If you see color banding is the soft proof with Rel. Color. selected, try Perceptual. With experience you will get a feel for which images best pair with each rendering intent.
    o Our profiles also feature a Saturation intent that is tuned to provide maximum useable saturation in the prints. If an image will benefit from increased saturation, give the Saturation intent a try. Most profiles either reserve the Saturation intent for PowerPoint-type graphics use or simply map it to the Perceptual intent. Our new profiles are designed to give photographers another technique to get the best prints possible.
    o Note: If you have setups that you use frequently, they can be saved using the "Save" button in the Proof Setup dialog. This makes the setting available directly from the View→Proof Setup menu.
    o If you wish to save a proof setup as the default, hold down the Alt/Option key. The "Save" button changes into "→Default". Push the button to save the selected proof setup as Photoshop's default.

11. Simulation Options:

   o These attempt to show the reduced contrast range the printed page will have vs. what your monitor can show. Without them you will have an over-optimistic view of the final contrast.

   o It is easiest to perform any major color and tonal adjustments without Simulate Paper Color (Photoshop CS2) or Paper White (Photoshop 6.0 through CS) or Ink Black checked.

   o The Simulate Black Ink (Photoshop CS2) or Ink Black (Photoshop 6 through CS) simulation should be checked to see if the shadow detail in your source image will hold up in print. This is particularly important for images with significant shadow detail. If your shadow details disappear, selective dodging can bring them back.

   o Simulate Paper Color/White attempts to show the effects of the difference between your monitor's white level and the (usually) less bright paper. This simulation is less accurate than the Ink Black, but can be helpful for ensuring critical highlight details hold up.

   o When you check the Simulate Paper Color box, the look of the image will likely change dramatically. This is an artifact of Photoshop trying to make the light emitted from your monitor match the look of light reflected from the printed page. The simulation works best if all white user interface elements (toolbars, palettes, etc.) are hidden. Use Photoshop's Full Screen mode for the most accurate view, and glance away as you switch the simulation on.

12. If you do not see significant changes when soft proofing, this is OK. This means your image contains colors that mainly lie within the printer's gamut. If the images do not match well enough, the following steps can help.

13. Set the highlight and shadow points in the Levels dialog box. In Photoshop, hold down Alt/Option while adjusting the level sliders. This will show any shadow or highlight clipping that occurs. The ideal setting is usually the point right before clipping occurs.

14. If the duplicate image that you are Soft Proofing looks greatly different from the original, minor curves or color balance adjustments are often all that are needed to bring things into line.

   o What's going on? The problem is that your monitor screen is capable of showing a much wider contrast range (usually 300-500x between black and white) than is the printed page. By adjusting the Soft Proof image you can visually compensate for some of the discrepancy. An intelligent levels adjustment, or slight boost to saturation is usually all it takes to give your prints the needed pop.

15. An optional step is to check the image for out-of-gamut colors (View→Gamut Warning).

   o If you do not like how the profile handles the out-of-gamut colors, first check the rendering intent alternatives. If none are acceptable, you can manually bring the colors within gamut. This will not be as mathematically accurate as the profile, but it can preserve the aesthetic feel of the image.

   o Open the Hue/Saturation tool. Use the eyedroppers and color selection sliders to select the out-of-gamut colors. You can (in order of preference) change the lightness, tweak the hue, or very slightly reduce the saturation to bring the problem colors within gamut. Note that all your edits are being performed in the file's editing color space rather than in the printer color space. This makes edits more predictable and controllable.

16. Any remaining color casts or lack of saturation can usually be fixed by minor curves tweaks. See the references on our web site for links to books and web sites on editing techniques.

   o If you can't seem to get one or more colors right, the problem may be that your monitor is not capable of displaying the colors correctly. To check for this, soft proof using your monitor profile, and turn on the gamut warning (View→Gamut Warning). This is a useful technique in other cases, and is a good check when your prints do not match your monitor.

17. At this point, you may want to convert the image to the output color profile (Image→Mode→Convert to profile). This is particularly true if you are sending the image to be printed on a device like a Frontier. Frontiers do not read embedded profiles, so without the conversion, all your hard work will be wasted. If you are soft proofing, the image will change appearance at this point. Photoshop is not bright enough to remember your Paper White and Ink Black simulation settings, so the image is shown without the benefit of these tools.

18. Our preference is to archive both versions of the image — the original and the converted and profiled duplicate. To print the image on a different printer, start with the original rather than performing endless series of profile conversions that will slowly degrade the image.

Printing With Icc Profiles

1. If you are printing directly from Photoshop, you want to ensure that your printer is set up exactly as it was when you printed the profiling target. In most cases, this means turning off all printer color management and automatic image enhancements. You are letting the profile and Photoshop's conversion do the color work rather than relying on some image-dependent algorithm.

2. If you are using a CMYK printer, the details of CMYK separations are beyond the scope of this brief list. In most cases, this is not terribly difficult – get a good reference book. We have a list of helpful, well-written books in the resources section of our web site.

3. In Photoshop 7 and later, use the Print With Preview dialog for printing. It gives you the necessary control over the color management functions.

4. If the full dialog is not visible, click the "More Options" button (CS2) or the "Show More Options" box (earlier versions).

5. Select "Color Management" from the drop-down list.

6. Select "Document" in the Print section (CS2) or Source Space (6 – CS).

7. If your document is in a standard editing color space, choose the appropriate printer profile and rendering intent in the output/Print space area. For Photoshop CS2 users, you need to select "Let Photoshop Determine Colors".

   o You almost always want to have "Black Point Compensation" checked. This scales the black level to match your printer's capabilities.

   o If the image is already converted to your printer profile, choose "No Color Management" in CS2's output options or "Same as Source" in earlier versions of Photoshop.

8. If you are sending the image out to be printed, talk with the lab to make sure they do no further color adjustments or conversions to your work.

Print Matching

If you have concerns about prints matching your display, first ensure that the monitor is accurately calibrated and profiled. As mentioned above, the entire color managed workflow hinges on your monitor's color accuracy. Without an accurate monitor profile, a printer profile has nothing to match *to*.

Assuming your monitor is accurately calibrated and profiled, check that your monitor profile is actually being used by Photoshop:

- Open the RGB Working Space list in Photoshop's Color Settings dialog box.

- Scroll up until you come to the line "Monitor RGB – xxxx".

- If xxxx is not the name of your monitor profile, something is amiss.

- Either your profile is not installed as the system default, or the profile itself is bad. Try regenerating the profile.

- **Important**: Press Cancel to exit the Color Settings dialog box without inadvertently doing something dumb such as selecting your monitor profile as your default working space.

Our profiles are also tuned by default to viewing under D50 illumination. This is *not* the same as standard incandescent, fluorescent, or sun light. We can create profiles for these conditions, but D50 is the publishing industry standard. For critical color matching, view the prints in a D50 light booth, preferably with an adjustable dimmer. The light emitted from your monitor will never be a perfect match for light reflecting from a print surface, but our printer profiles combined with your accurately profiled monitor should get you very close indeed.

Appendix A – Target Cropping and Sizing

Our profiling targets can be resized to a certain extent. This includes changing print resolution and increasing or decreasing the paper size. The target colors must not be affected by this process, and the size of the measurement field must remain fixed. Several scenarios are outlined below:

Changing Target Print Resolution: Our regular targets are printed at 300 ppi. If your printer has good image interpolation algorithms (e.g. optical printers such as Durst Lambda, LightJet, Chromira, etc.), simply send the target to the printer. Otherwise, resolution scaling is most easily performed in Photoshop. Use the "**Nearest Neighbor**" interpolation in the Image Size dialog. This preserves the full color information – we do not want the color blending that other interpolation modes create. Make sure the "Constrain Proportions" option is checked to prevent target distortion. **Only** change the resolution, **not** the pixel dimensions, width, or height.
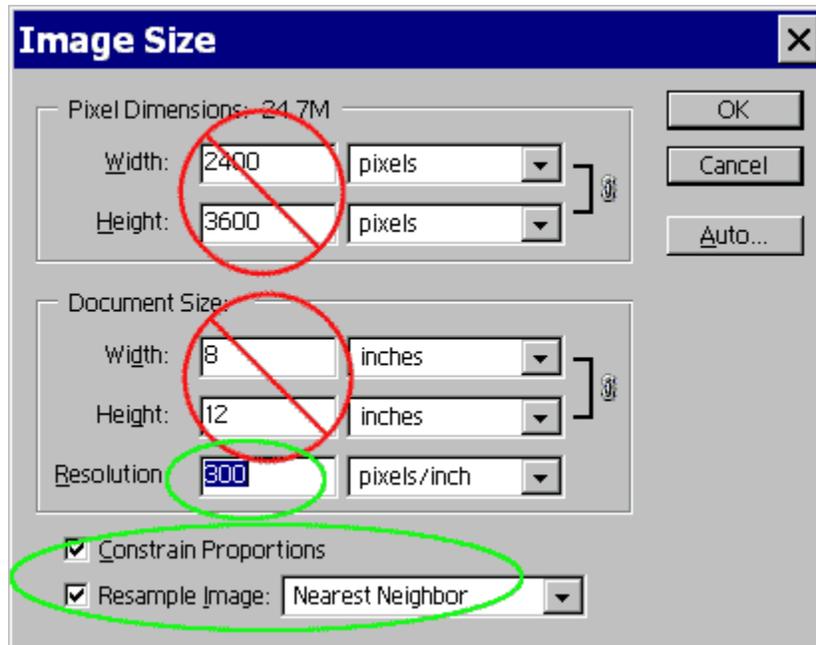
Reducing paper width: The width of the 8x10 targets can safely be reduced to 7.5 inches. Use Photoshop's Canvas Size to precisely crop the center of the image. Select the Center anchor, and <u>do</u> <u>not</u> <u>change</u> the height. Click "Proceed" when Photoshop prompts that clipping will occur.
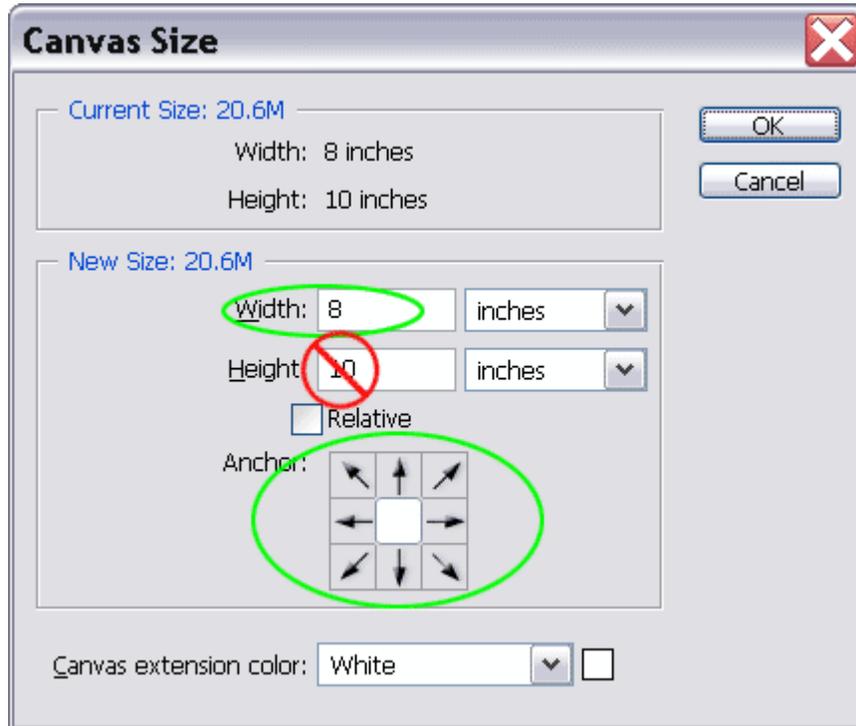
Increasing canvas size: If you need to make the paper size larger, simply use Photoshop's Canvas size. Do not use Image Size to increase the dimensions of the target patches themselves.

Special Requests: If you are having difficulty fitting our targets into your printer environment, please contact us. In most cases we can generate a custom sized target to meet your needs.

Appendix B – Fuji Frontier Profiling

Our Fuji Frontier targets are sized for 8x10 printing only. If you require other size targets, please contact us. We can support any standard paper size on an as-needed basis.

The targets are designed to be printed using the "Fill In" cropping mode. Please do not print with additional borders or in a different cropping mode. The targets are slightly oversized to take the standard overprinting into account. Perform a calibration cycle prior to printing the profile targets.

All the automated digital image processing corrections must be disabled. These include the Image Intelligence, FDIA, Hyper-tone processing, color gradation processing, contrast and exposure correction, etc. All these corrections perform image-specific adjustments that are incompatible with a profiled workflow.

Checking for Image Intelligence

Check the gray step wedges printed on each page of the targets. If step 1 (light gray) prints as white, Image Intelligence is probably on. Turn it off and reprint the targets.

Normal Print

Image Intelligence Enabled

Appendix C – Noritsu MLVA and Laser Profiling

The MLVA (model 2xxx) Noritsu printers and the Laser (Model 3xxx) series have their own profiling targets. This is primarily to compensate for the difference in output resolution. The MLVA printer targets are 400 ppi tiffs, while the Laser model targets are 320 ppi.

Our Noritsu targets are sized for 8x10 printing only. If you require other size targets, please contact us.

- o The targets are designed to be printed using the "CUT" cropping mode. Please do not print with additional borders or in a different cropping mode. The targets are slightly oversized to take the standard overprinting into account.

    - o Function ►Menu ► Extension ►Setup ► Print Channel

    - o Please use the "CUT" mode even on newer Noritsu 3xxx printers that have 300 ppi output resolution.

- o All automated digital image processing corrections must be disabled. On Noritsu QSS machines, these include:

    - o Digital Media Corrections: Uncheck the "Media Correction (Usual Media)" box if printing from a CD.

    - o DSA/Judgment Image Correction adjustments. Confirm DSA settings of Contrast 0, Sharpness 0, and Chroma 100.

    - o The channel ± corrections should normally be set to zero as well.

- o We strongly recommend performing both the Daily Setup and Emulsion Number Change calibrations prior to printing the profile targets.

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Kodak DLS

For Kodak DLS controlled printers, we have not seen acceptable print quality with any DLS software versions before 3.0. We strongly recommend upgrading to Version 3.0 or newer before purchasing printer profiles.

Several image enhancements need to be disabled on DLS printers to get correct color output:

- In the System Configuration screen, select the Image Defaults tab.
- Set the Tone Scale to Low.
- Disable both Contrast Normalization and Underexposure.
- Set Saturation to Normal.
- These settings should be saved as a preset to recall when profiled prints are run.
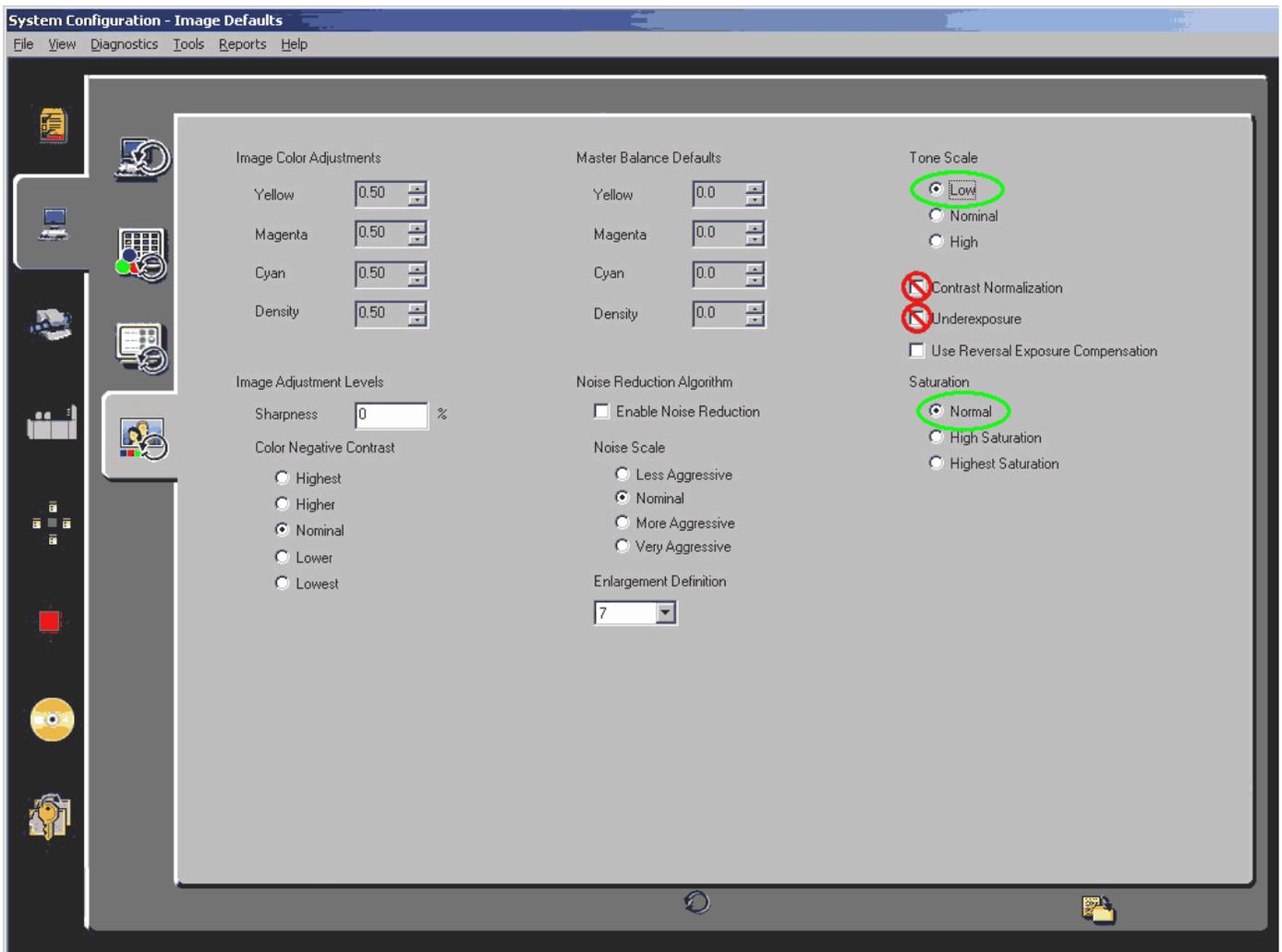
Appendix D – Agfa d-Lab Profiling

Our Agfa d-Lab targets are sized for 8x10 printing only. If you require other size targets, please contact us.

All automated digital image processing (dTFS) corrections must be disabled. We recommend printing with the normal cropping mode instead of Reproduction mode. The color response is different in Reproduction mode, and this mode does not allow the printer to interpolate your customer's images to the desired print size.

Appendix E – Determining Inkjet Media Type

If you use third party inks or papers for an inkjet printer, the printer driver will not have a built-in preset for your particular combination. The paper type chosen is critical to getting high quality prints. This governs ink limiting and linearization, dot placement algorithms, and related print parameters. Some inkjet paper manufacturers offer their recommendations of paper type to choose for particular printers. These are usually the best place to start. If you do not have a setting for your particular combination of printer, paper, and ink, our printer evaluation target can be used to find the optimum setting.

Four copies of the printer evaluation target can fit on a single A4 sheet. Select a likely media setting/paper type and print one version in the upper left corner of the page. Use Photoshop's Print with Preview options to select the print location. It also helps to print in Landscape orientation. Wait a few minutes for the print to dry, choose a different media setting, and print again. This time, print the image in the upper right corner. Repeat for two additional media setting or paper type choices.

Evaluating the test prints

The Printer Optimization section earlier in this document contains a full description of the target and overall evaluation strategies. The quick summary is:

- The most important factor is the gray scale at the top of the target. Look for the option that gives the best shadow resolution.

- Overall color casts are not a concern – the profile will fix these.

- As a sanity check, make sure the finest ink density check crosshairs are not completely filled in. Also do not use any options that produce paper warping in black areas from over-inking.

- It is better to choose a media setting that deposits slightly too much ink rather than too little. The profile will help linearize the ink output. Too little ink on the paper reduces the printer's color range.

- If you need a tie-breaker, look at the color gradient spectrum. Choose the option that produces the smoothest overall transitions with the greatest range into shadows and highlights.

⇒ Make a note of the settings you used. You need to use them for both printing the profile targets and when you use the printer profile for your real prints.

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Troubleshooting and Contact Information

If you have questions about printing the profile target or using your custom profiles, please contact us:

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5521 SE Hacienda St
Hillsboro, OR 97123

profiles@drycreekphoto.com
971-563-3801

Thank you for your business. We wish you the best in printing.

Sincerely,
Ethan Hansen
Director
Dry Creek Photo
October 26, 2005

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