



Optimize for Commercial Printing

Optimizing images for commercial offset printing may seem like a specialized topic, we admit. But dare to dream a little ... your photographs may well find their way into books or magazines.¹ And if you run a business, you may already have had a need to run photos as part of advertisements in newspapers, the telephone directory, and other high-volume publications. If so, then you need this section.

1. Art buyers are always on the lookout for new talent and great stock.

Commercial Offset Printing: Setup

In order to optimize for offset printing, your image editing application must be able to edit images in “CMYK mode” in addition to RGB mode. As we write this, Photoshop Elements does not offer CMYK mode. That feature set is reserved for Photoshop. So we’ll use Photoshop to demonstrate this type of optimization.

Color Settings

Begin by establishing the correct default color settings for Photoshop. (If you’re using a different image editing application, set its default color settings to values that are similar to Figure 1-1.)

1. Choose **Edit > Color Settings**, then click **More Options** to display the entire dialog box (Figure 1-1).
2. Select **North America Prepress** from the **Settings** dropdown list. This populates the rest of the fields in the dialog box with the appropriate settings.
3. If your print vendor has supplied you with an ICC profile for the press and paper that will be used to print your job, select that profile in the **Working Spaces: CMYK** dropdown list. Otherwise, ask your print vendor to tell you whether your job will run on a sheet-fed or web press, and whether the paper will be coated or uncoated.² Then choose the CMYK working space that most closely matches the press setup. In Figure 1-1, we’ve taken the default: **U.S. Web Coated (SWOP)** profile.
4. Leave the **Gray** and **Spot Dot Gain** settings at their default values unless your print vendor advises otherwise. Dot gain refers to the average amount that a drop of ink will spread when it comes into contact with the paper. Various paper types have various dot-gain characteristics. For example, newsprint has much higher dot gain than coated papers.
5. The rest of the default settings for **North America Prepress** are fine, with one critical exception. In the **Conversion Options** box, change **Intent** to **Perceptual**. *Do not leave this setting at its default value (Relative Colormetric)*. The default value is there for consistency with Adobe’s vector-based applications (Illustrator, etc.) and is usually inappropriate for printing photographs.
6. Click **OK** to save the color settings.

² He might also be able to tell you the “total ink limit” of the press. We’ll use that information in just a minute.



The Description area provides information about the many settings that are available in this dialog box. Describing all of them is beyond the scope of this brief section; however, we encourage you to refer to the Photoshop documentation to learn more about the power that these settings offer.

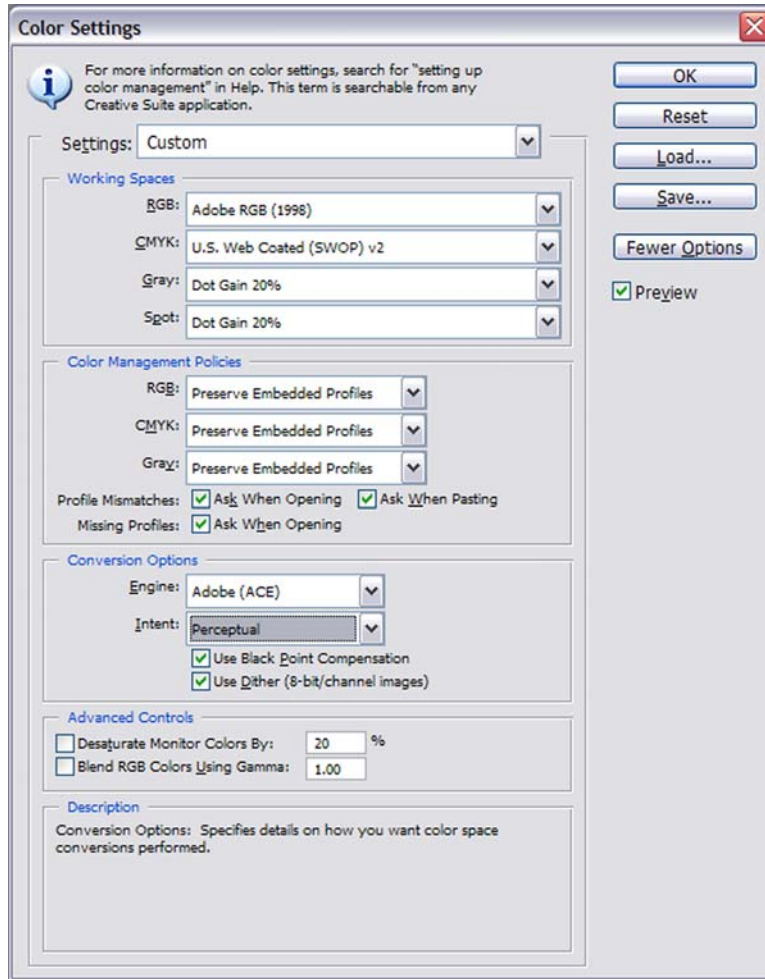


FIGURE 1-1 Photoshop Color Settings for commercial offset printing

Commercial Offset Printing: Color Samples

Follow these steps to begin optimizing images for commercial offset printing.

1. Set up Photoshop's Color Settings (see page 2).
2. Optimize your images for the screen. Keep the image in 16-bit mode for as long as possible.
3. The CMYK colorspace that we're about to switch to is smaller than the Adobe RGB (1998) colorspace that we've been working in. Therefore converting to CMYK often causes colors in your image to become more muted. It doesn't happen 100% of the time, but it's definitely something to watch out for. We recommend increasing the color saturation between 5% - 15% to compensate for this muting effect. For our test image (Figure 1-2), we find an 8% saturation boost to be about right.

Choose Image > Adjustments > Hue/Saturation and increase Saturation between 5% - 15%.
4. Choose Image > Mode > CMYK Color. Watch the image closely; you may see the color saturation drop, which is why we boosted it in the previous step.
5. Choose Window > Info to display the Info palette.
6. Choose the Color Sampler Tool.
7. Find the blackest black pixel in the image and click to mark color sample #1.
8. Find the whitest white pixel where you want to hold just a slight amount of detail. Click to mark color sample #2.
9. Photoshop supports up to 4 color sample points. Blacks and whites are most important, which is why we sampled them first. Since our shot contains a person, it's a good idea to optimize skin tones, too. We'll use sample points 3 and 4 for that.
10. Locate a bright area of the forehead, then click to mark color sample #3. We chose a spot just above the subject's right eye.
11. Choose a darker spot for the last color sample. A rosy cheek works well. We chose her right cheek, and clicked to mark color sample #4.



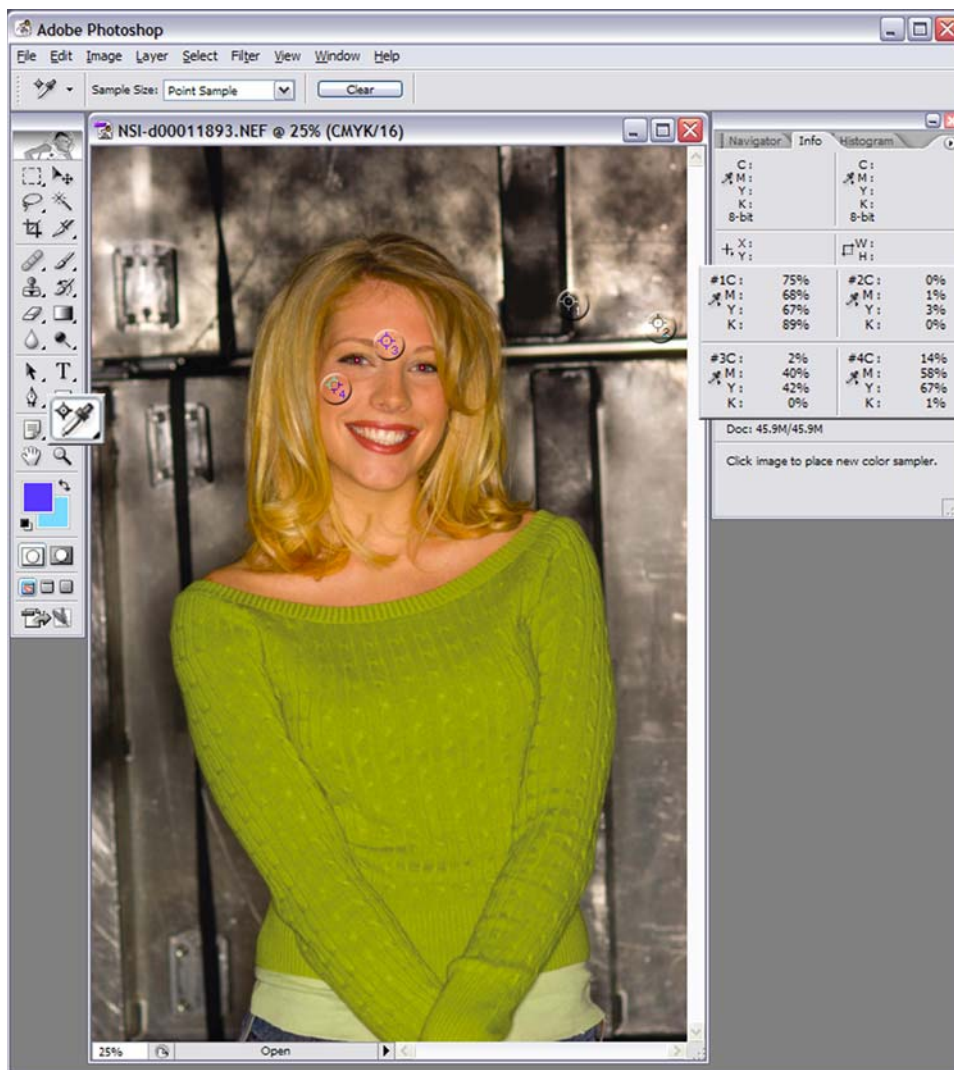


FIGURE 1-2 Info Palette, Color Sampler Tool, and 4 color sample points

The Info palette shows us the CMYK values for each of the 4 sample points. These values represent the amount of each of the 4 primary colors of ink (as a percentage of total coverage) that the press will apply at those points to create the image. Our next task is to adjust the color in the image to match the capabilities of the press. You can't do that by looking at the image ... you'll have to do it "by the numbers."

Commercial Offset Printing: Blacks

Now we're ready to adjust the colors in the image to match the capabilities of the press.³

1. Choose Image > Adjustments > Selective Color. In the Selective Color dialog box, set Method to Absolute. Notice that the Info palette now shows 2 columns of numbers for each color sample. The first number is the original value; the second number is the changed value that results from the following adjustments.
2. Select Blacks from the Colors dropdown list. Now we're adjusting only the blacks in the image. Our goal is to create a good neutral black when printed. Watch the values of color sample #1 (our black pixel) change as we make the following adjustments (Figure 1-3).
 1. Drag the Cyan slider until the C value of sample #1 is 82-83%. The C value of sample #1 was originally 75%, so we increased Cyan +8 to reach C=82% in sample #1.
 2. Drag the Magenta and Yellow sliders until the M and Y values of sample #1 are both in the range 63-70%. In Figure 1-3, the M and Y values are already at 68% and 67%, respectively, so we did not need to adjust Magenta and Yellow.
 3. Drag the Black slider until the K value of sample #1 is 93%. We increased Black +4 to reach B=93% in sample #1.
 4. Toggle the Preview checkbox on and off. The blacks in the image should now look much richer when Preview is on.

NOTE

Add up the adjusted values of C, M, Y, and K in sample #1. This represents the "total ink limit" of the image. Ask your printer what the total ink limit is for the press that will print your job, then adjust the C, M, and Y values so that you don't exceed that total limit. If you can't get specific information about the press, then a total ink limit of 300-310 is good for most modern presses in the US. (In Figure 1-3, the total ink limit after adjustments is $82+68+67+93=310$.)

3. In an RGB color space, "neutral" blacks, grays and whites have equal amounts of R, G, and B (i.e., 0,0,0 or 128,128,128 or 255,255,255). But in CMYK color space, it takes *different* amounts of primary color inks—plus an additional dollop of pure black—to create good "neutral" colors. That's why we're taking the time and trouble to adjust the ink levels before printing.



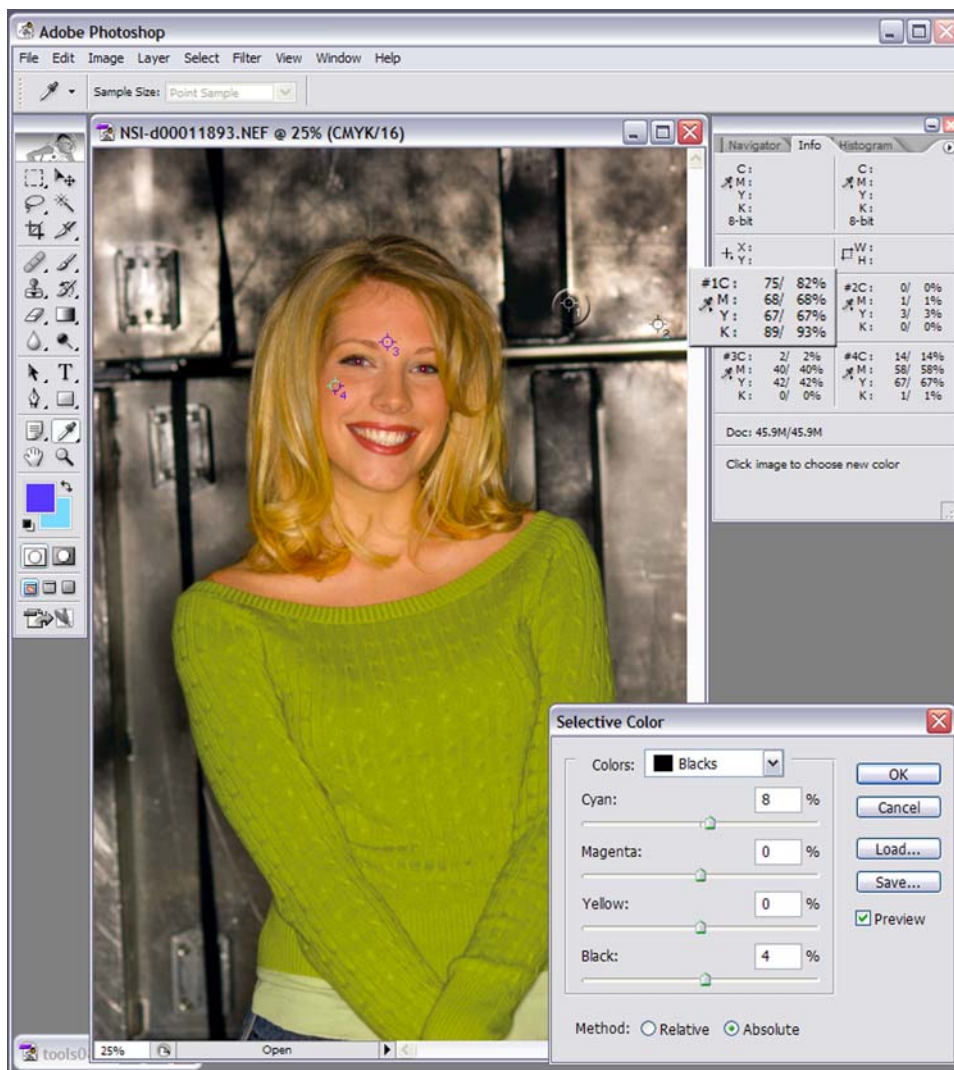


FIGURE 1-3 Color Sample #1 (black pixel) optimized for Blacks

5. Do not click OK yet! You have only optimized the blacks. Proceed to optimize whites and skin tones as described in the following section.

Commercial Offset Printing: Whites & Skin Tones

Tuning Whites

1. Select Whites from the Colors dropdown list. Now we're adjusting only the whites in the image. Our goal is to create a good neutral white when printed. Watch the values of color sample #2 (our white pixel) change as we make the following adjustments (Figure 1-4).
2. To get a clean neutral white, your goal is to make the C, M, Y, and K values of sample #2 equal to 5, 3, 2, and 0 respectively. As you can see in Figure 1-4, this required us to set the Cyan, Magenta, Yellow, and Black sliders to 5, 2, -1, and 0, respectively.

Tuning Skin Tones

When fine tuning skin tones, there is no absolute “right” answer. Each person's skin is unique, so you'll just have to use your artistic eye to achieve a result that is pleasing. As a general guideline, Caucasian skin tones typically need to have less Magenta than Yellow: perhaps 5-10% less M than Y in samples #3 and #4.

In Figure 1-4, sample #3 shows M=40 and Y=42. That's a 2-unit difference: not bad. Sample #4 shows M=58 and Y=67. That's a 9-unit difference: even better. So while sample #3 is not within our “ideal” range of 5-10 points difference ... it's close enough for us. Adjusting Magenta and Yellow to make sample #3 “ideal” would throw sample #4 off, so we'll leave well enough alone.

If you do need to adjust the skin tones in an image, follow these guidelines.

1. Select Reds from the Colors dropdown list.
2. Adjust the Yellow and/or Magenta sliders as you watch the values of samples #3 and #4. Find a happy medium of 5-10% less M than Y in both points. You may also want to add just a bit of Cyan to the Reds to neutralize the skin tone and keep it from looking too saturated.
3. Select Magentas from the Colors dropdown list.
4. Adjust the Yellow and/or Magenta sliders as you watch the values of samples #3 and #4. Find a happy medium of 5-10% less M than Y in both points. You may also want to add just a bit of Cyan to the Magentas to soften the lips and keep them from looking too saturated.



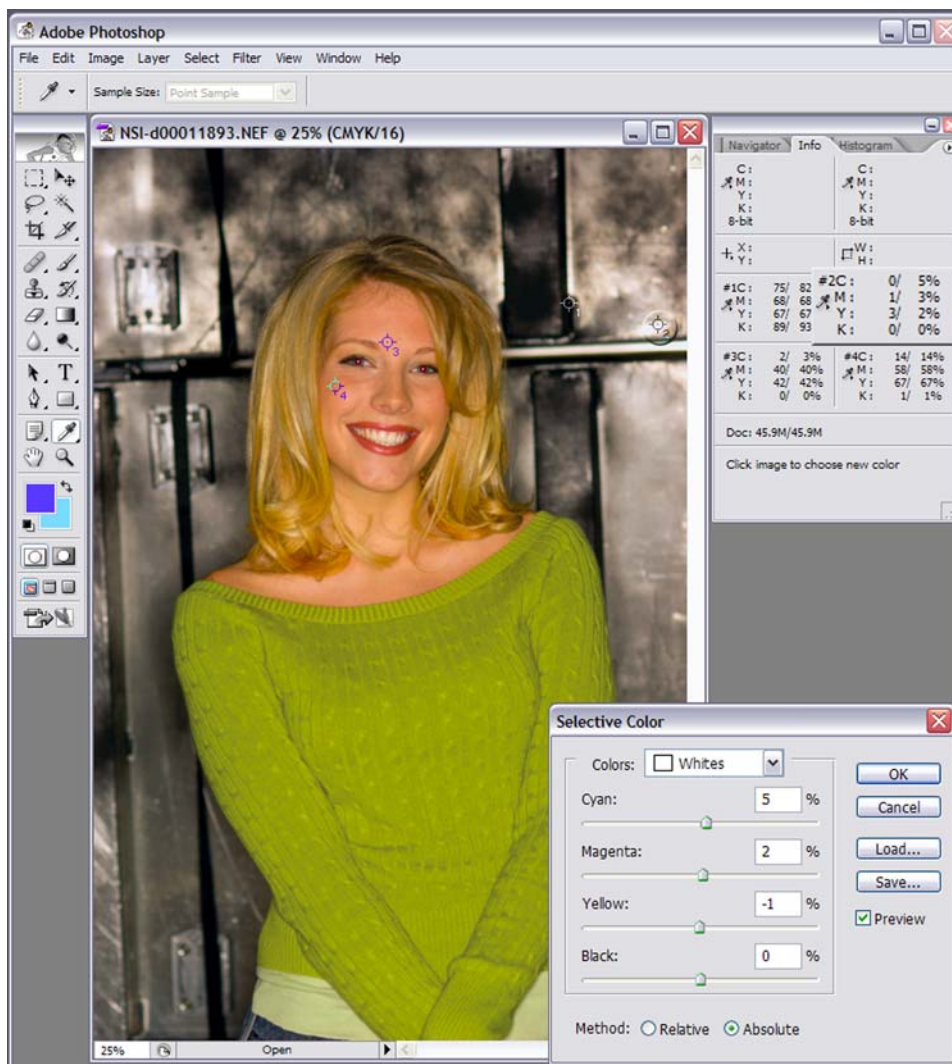


FIGURE 1-4 Color Sample #2 (white pixel) optimized for Whites

5. Now you may click OK to save your color changes.
6. Save the file to a new filename. It's now ready for printing on a typical US press. Be sure to request a printer's proof so that you can verify your color settings on the actual press. You should also make sure your print vendor can accept 16-bit files. Otherwise, convert the file to 8 bits per channel (Image > Mode > 8 Bits/Channel) as the last step before saving and sending.

Summary

Optimizing for print is critical to get the best possible output on paper. While you may be able to print directly from your camera using a cable or wireless connection, your prints will be better if you take the time to optimize them first.

1. Capture the best possible shot, stored in RAW format.
2. Calibrate and profile your monitor.
3. Profile your printer.
4. Disable color management in your printer driver.
5. Optimize the image for the screen.
6. Adjust the Color Settings in your image edition application to use your printer profile (or a close approximation if a specific profile is unavailable).
7. If printing to an offset press, convert to CMYK color space and adjust the ink levels to get good neutral blacks and whites, and pleasing skin tones (if there are people in the shot).

