

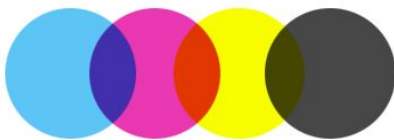
Color-accurate workflow in Adobe InDesign

Some basic color theory:

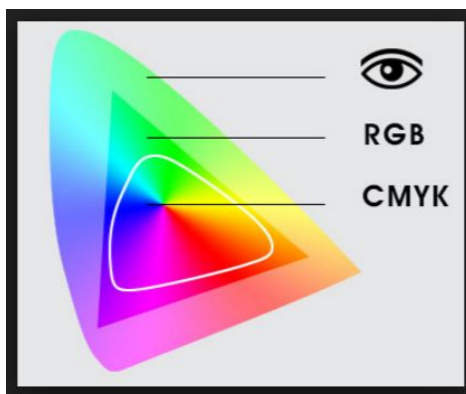
Photos are taken and graphic design is done using the additive RGB color model that reproduces colors by *emitting* light red, blue, and green wavelengths. It creates the impression of other colors by emitting a combination of these lights.



Offset printing instead uses the subtractive CMYK color model that reproduces colors by *absorbing* most wavelengths of white light and only reflecting back cyan, magenta, or yellow light. It creates the impression of other colors by partially absorbing a combination of wavelengths.



This means that in RGB, increasing saturation increases brightness, but in CMYK, increasing saturation decreases brightness. As a result, the RGB color space has a wider range of colors, and brighter ones can't be reproduced in CMYK at all.



This can result in situations where an image looks vibrant when viewed in RGB, but dull when converted to CMYK.



Automatic conversion can't help in this case, and the specific objects have to be adjusted manually to trick the eye into seeing a more vibrant color, while the other elements in the picture remain unchanged.



There's significant improvement in the visual vibrance, especially in the pink and yellow orbs - because they consist mostly of CMY component colors. The blue one is a mix of Cyan and Magenta, so while it's improved, it can't ever be as vibrant as in RGB.

What profiles can and can't do

ICC profiles are often misunderstood. Merely choosing the correct profile during export doesn't guarantee a color-accurate result. It doesn't even guarantee your images will use the correct profile.

The ICC profile is a "recipe" for converting RGB color values into CMYK values that exist in a color space for a specific medium. As mentioned earlier, CMYK has a smaller color space than RGB, but not all CMYK color spaces are equal - a brighter, heavier coated paper reflects more white light and can handle more ink than a duller, thinner uncoated paper.

Basically, the profile describes *what CMYK colors are available* for that printing process, and *how to convert* any RGB color into those CMYK values.

This also means ICC profiles *only work on RGB images*. If your photos have already been converted to CMYK using an uncoated profile (or the North American SWOP), then choosing ISO Coated v2 during export doesn't change the image at all.

It's possible to convert the images back to RGB and then to CMYK with the correct profile, but this will at best only limit the total ink to not exceed what the paper can handle - it will not result in an optimal reproduction of the original photo, because the extra color space was already discarded during the first, incorrect conversion.

To give an example - if you convert your vibrant photo of a blue flower to CMYK using an Uncoated profile, your bright blue becomes a much duller blue. If you convert this CMYK photo back to RGB, the blue won't get brighter (because the computer doesn't know that this new, duller tone isn't intentional). Even though the ISO Coated v2 color space is bigger and could let you print a more vibrant blue, you've limited yourself to the first, more limited color space.

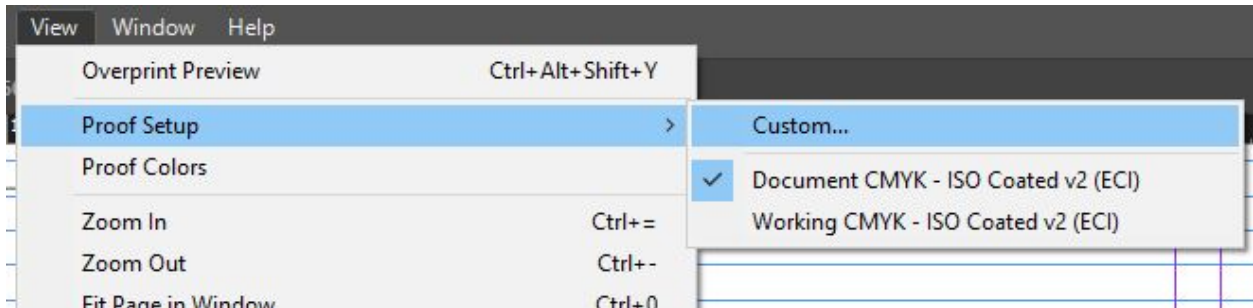
This is why it's best to always keep images in RGB until exporting the final print file.

In the 1990s and 00s, the recommended best practice was to do CMYK conversion manually for every photo, using the desired profile, and then saving CMYK versions as separate files. While this gave the designer a good idea of what the final result would be, it was very time-consuming and if there was a need to print the same job onto a paper that required a different profile, every image would have to be converted by hand, again.

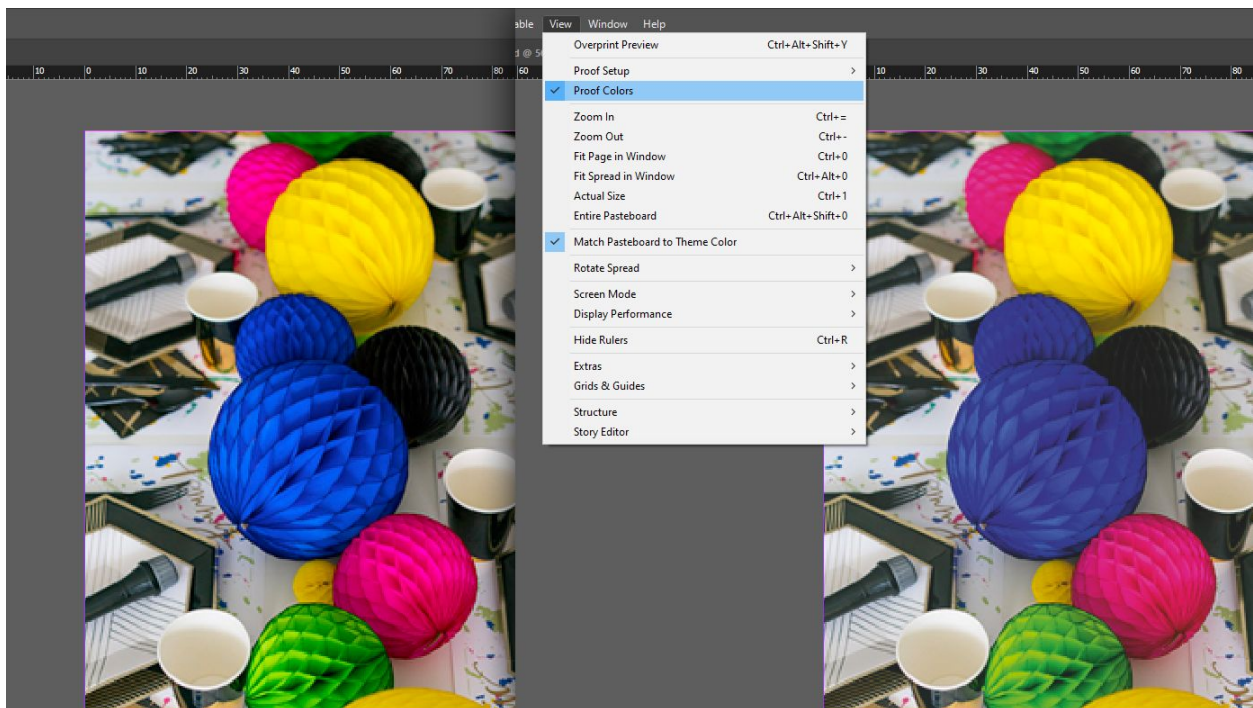
With modern Adobe CC workflows, this isn't necessary or recommended. All color artwork that originates in RGB (photos, illustrations, etc) can be kept in RGB - the conversion to CMYK will be done in the final step, when the PDF is exported.

How to achieve desired results

The key to avoiding unwanted outcomes is to work in **Proof Colors** mode. As stated before, all artwork should be kept in its original RGB color space, but InDesign should be in CMYK working mode, and **Proof Setup** should be set to the ICC profile you're designing for.



Then when you turn on Proof Colors, you will see the CMYK result.



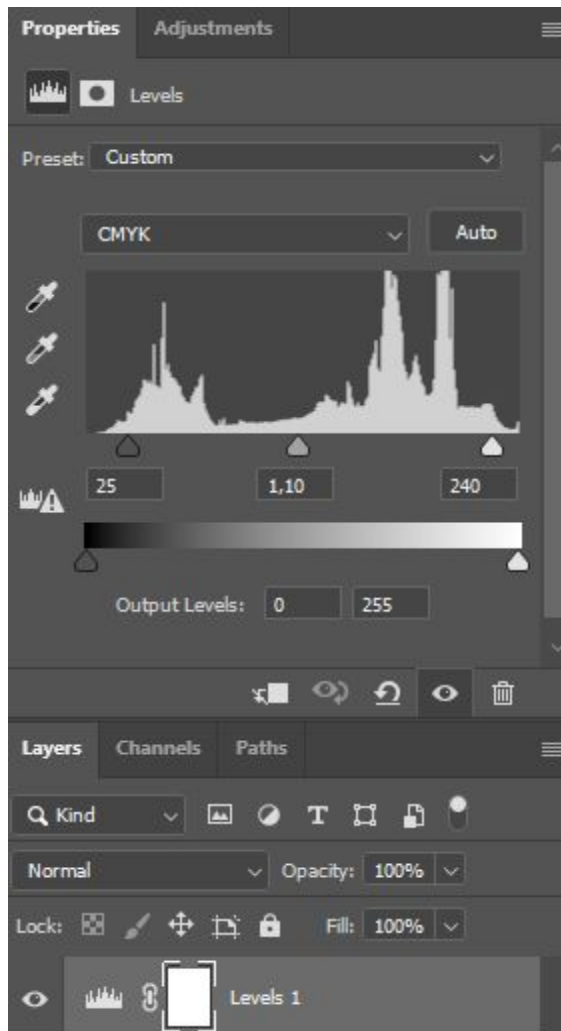
If the result is too dull or otherwise not to your liking, you can quickly open the image in Photoshop, add an adjustment layer to tweak it, and replace it in your InDesign document.

When adjusting photos, keep in mind the limitations of the **CMY** color model - blues are a combination of cyan and magenta, greens are a combination of cyan and yellow. You might need to increase their apparent brightness by darkening other parts of the image, or adding subtle highlights and shadows to the object itself.

Common adjustments and tips

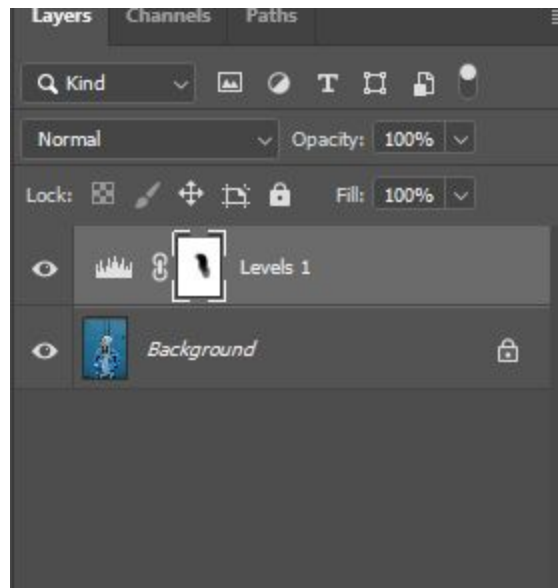
Apart from special cases like in the example photos above, where color reproduction is drastically different, the most common problem is a slight “washed out” appearance on CMYK photos. Photographers tend to adjust images in RGB to what looks good, but the more narrow dynamic range of CMYK can’t perfectly reproduce it.

A good tweak in this case is a Levels adjustment layer that compresses the dynamic range a bit.



The exact position of the shadow and highlight sliders depend on the image, but a good rule of thumb for the midrange is 1.10 (slightly left of center).

Sometimes the adjustment layer needs a slight mask painted on it if details are getting lost. A common place where that might happen is white cloth, like dress shirts or wedding dresses.



Select the mask of the adjustment layer, and use a soft brush at 20-25% opacity to paint over the areas where detail has been lost.