



# ColorChecker® Primer

## User Guide

With the ColorChecker Primer, you don't need to be a professional photographer to attain expert color results. This easy-to-use tool will help you achieve an accurate point of color reference while capturing photos, plus provide creative white balancing and color correction in your Raw editing software.

# Introduction

*Achieve better color from your photography*

*Easily make post-shoot adjustments*

*Ensure your final images represent accurate colors*

The ColorChecker Primer is an invaluable tool to help you achieve greater accuracy and creative flexibility with your photography.

Accurate white balance is a critical step in getting your color correct. By shooting the ColorChecker Primer under each lighting condition, you ensure that you'll have an accurate point of reference to begin your edits.

Most photographers recognize when skin tones don't look right, but before only those with strong color correction skills could fix it. Not anymore. The ColorChecker Primer provides White Balance warming patches to help you attain the truest skin tones with just the click of an eyedropper, in virtually any Raw processing application, such as Adobe® Photoshop®, Lightroom® 2 and Elements®, as well as Phase One Capture One and Bibble.

The ColorChecker Primer also offers Spectrum patches to help you make specific color edits to Hue, Saturation, and Lightness. Since the patches correlate with the HSL sliders in most Raw processing applications, including Adobe Photoshop and Lightroom, you can easily make edits while retaining color fidelity.

The patches in the ColorChecker Primer are a subset of the more robust ColorChecker Passport solution. If you are looking for even more control from capture to edit, ColorChecker Passport may be a logical upgrade.

This document is divided into sections to help you understand how to best use your ColorChecker Primer:

Getting the Most From Your ColorChecker Primer:

- Benefits of Shooting in Raw
- Importance of a Calibrated Display
- Raw Processing Applications
- Tips for Capturing the ColorChecker Primer

The ColorChecker Primer White Balance Patches

- What Role does Light Play in Photography?
- White Balance in a Raw Workflow
- How to Set White Balance in Adobe Photoshop
- How to Warm Portraits in Adobe Photoshop

The ColorChecker Primer Spectrum Patches

- Hue, Saturation and Lightness
- How to Use the Spectrum Patches to Correct Color in Adobe Photoshop

Upgrading to the ColorChecker Passport

# Getting the Most from your ColorChecker Primer

## Benefits of Shooting in Raw

If you are not familiar with the benefits of shooting in Raw format, you may just see it as producing giant, clunkier files that require extra steps in your workflow. The truth is, shooting in Raw provides greater flexibility to color-adjust images based on how a particular camera captures color.

Think of a Raw file like the digital equivalent of a film negative, but with added flexibility. You can make unlimited adjustments to your image, but in the end you still have a record of what you originally captured. The Raw file will not be affected by any of the adjustments, and can be used again and again to “develop” the photo in different ways.

Here are just a few of the advantages of shooting in Raw:

1. When working in Raw, you can achieve higher quality color because you are working with all of the data that the camera captured and you can adjust and apply all of the color edits, white balance, brightness, and contrast to the image data at one time. With JPEG, these settings are set in the camera and may lead to undesirable results such as clipped highlight and shadow data. Any edits made in software are in addition to the in-camera adjustments.
2. Any edits you make to a Raw file are non-destructive, meaning the original data is maintained and the edits can be re-adjusted.
3. Raw provides better quality image data than JPEG, which can lose detail and add noise.
4. Raw files are 12- to 14-bit data vs. 8-bit data, providing more precision and better control of highlights and shadows. They also allow bigger adjustments in color without posterization.

## Importance of a Calibrated Display

Have you ever wondered why the colors you see on your monitor don't match the scene you photographed? That's because what you see on-screen is only as accurate as your display. Quite often monitors are set to be extremely bright, which will affect the match between display and print. Plus, over time, the color performance of monitors change – phosphors and liquid crystals begin to fade, and the display's colors will drift. Calibrating and profiling will optimize your monitor's settings and bring back the true colors.

Working on a calibrated monitor can be indispensable for previewing edits and making color-critical decisions. Seeing colors closer to the way they will print will save you the time associated with trial-and-error editing. Take this easy step and be confident your edits are actually making the changes you want.

For more information about monitor calibration, visit [www.pantone.com/cmdesign](http://www.pantone.com/cmdesign).

## Raw Processing Applications

There are a number of applications you can use for basic Raw photo color correction, such as Adobe® Photoshop®, Lightroom® 2 and Elements®, as well as Phase One Capture One, and Bibble Lab Bibble. These applications are designed specifically for photographers to make basic color corrections, adjust for exposure and contrast, crop images and build a collection of images. The main differentiator between these programs is that Bibble and Capture One support the use of ICC profiles, while Photoshop, Lightroom, and Elements work with Adobe DNG profiles.

Custom profiles can be especially useful in getting to accurate color, fast. Both ICC and DNG profiles can represent your camera, lens and lighting conditions, but there are differences in how they are made and used. DNG profiles are currently unique to Adobe applications. They perform virtually the same tasks as ICC profiles, but are proprietary to Adobe products.

The ColorChecker Primer was developed with tight agreement to Photoshop, Lightroom and Elements. However, since most applications share the same tools and steps, you can easily adapt the steps to work in whichever program you use.

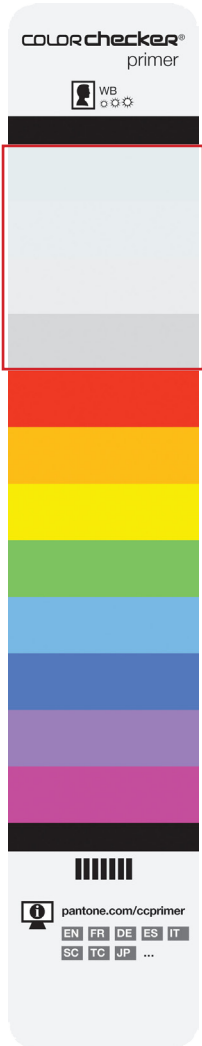
### **Tips for Capturing the ColorChecker Primer**

When capturing the ColorChecker Primer, there are a few things you need to keep in mind:

- Photograph the ColorChecker Primer in the same lighting as your photographs, and be sure to take a new shot each time the lighting conditions change.
- Place the ColorChecker Primer as flat as possible in the scene, making sure it does not curve.
- Ensure proper exposure. Blown-out white balance patches will not provide an accurate white balance.

Then, focus and shoot!

# The ColorChecker Primer White Balance Patches



## What Role does Light Play in Photography?

Light comes in many different qualities and colors. Daylight can appear bluish or yellowish. Artificial indoor lighting can range from a warm, yellowish tungsten light to the greenish hue you see in offices and shops. Since the human eye does a great job of compensating for all of these different color light sources, our perception adjusts without us really noticing. However, since cameras see light literally, these subtle shifts can pose a problem.

When using film, photographers have to select a specific film type or change filters on their lenses to make sure their whites were actually white and their grays remained gray. In some cases, a photographer might even use a filter to artificially add warmth to an image. This process is what we now call “white balancing.”

Digital cameras make white balancing easier, but they aren’t perfect. Most include a range of preset white balance settings, such as tungsten, fluorescent, daylight, flash, cloudy, and shade. These settings are based on averages, so they don’t necessarily represent the actual lighting you are shooting under, and they can’t easily or accurately account for mixed or blended lighting.

Out-of-the-box, your digital camera’s “Auto White Balance” is pretty good at correcting for ambient light color, but it can be fooled. For example, a camera may not be very accurate at selecting a white balance under low lighting, and may even add a color cast.

The ColorChecker Primer White Balance patch provides a starting point for all edits, reducing the time and effort required to get accurate color. Without a standard reference such as this, you’ll spend a lot more time color correcting each image manually.

## White Balance in a Raw Workflow

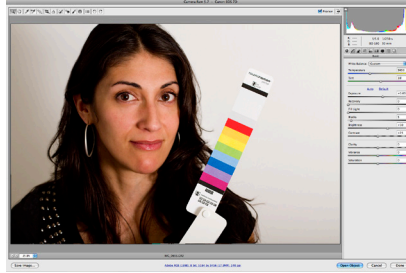
Setting a consistent white point in a set of images reduces editing time in a Raw workflow because there is not a need to individually adapt white points for each image. But the real power of Raw format is the ability to work in software to set white balance and alter images without destroying original image data.

While some users wait to adjust the white balance sliders or click on various near-neutral objects to get the balance they like in the software, the results are not consistent. This becomes even worse when shooting an event like a wedding where the lighting changes from one location to the next, yet the entire event should have a consistent feel.

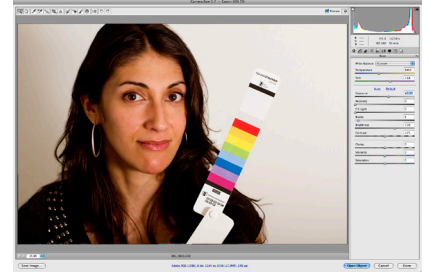
The ColorChecker Primer White Balance patches make color consistency a breeze. Simply shoot the ColorChecker Primer in each new lighting condition, use it to set the white balance in your software, then apply the same white balance to all of the images that were shot under those same lighting conditions. For added creativity, select the bluer patches to warm up flesh tones in portraits.



Original image



Neutral White Balance



Warming White Balance

## How to Set White Balance in Adobe Photoshop

Photoshop and Photoshop Elements both use the same Camera Raw Plug-in, and the white balance tool works just as it does in Lightroom.

1. Open the image with the ColorChecker Primer in Photoshop.
2. Select the White Balance tool from the upper tools bar (third from the left).
3. For a neutral white balance, select the patch closest to the Spectrum patches.

## How to Warm Portraits in Adobe Photoshop

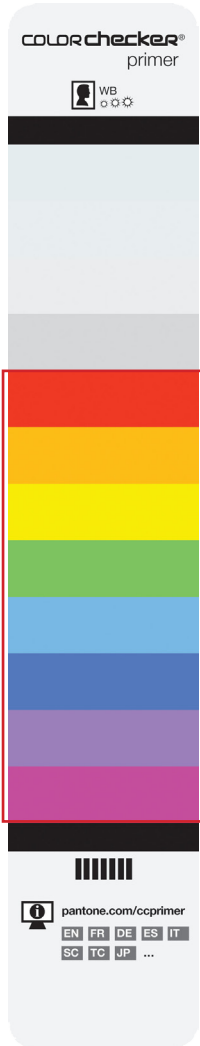
In addition to the white balance patch, the ColorChecker Primer includes bluer patches for warming portraits, which can portray a more appealing and healthy look than purely accurate tones. Choosing one of the bluer tints will actually create a new “neutral” to allow for a little more creativity. The more cool the patch, the more warm the effect.

For example, when you select a warming patch, the actual patch is a blue tint. The software will balance that sample patch to neutral, and all other colors will shift slightly to the opposite of blue, which is yellow. Then, if you select a patch that is more blue, it will shift all of the colors to more yellow.

These steps are taken from Adobe Photoshop, however since most applications share the same tools and steps, you can easily adapt the steps to work in whichever program you use.

1. Open the image with the ColorChecker Primer in Photoshop.
2. Select the White Balance tool from the upper tools bar (third from the left).
3. Select each of the White Balance warming patches to see which gives the effect you’re looking for. When you select a warming patch, the white balance values will be corrected to the neutral values. Click on any of the patches to see the warming result.
4. When you are satisfied with the result, click the warming patch one last time to set it as the new white balance.
5. Once you find something you like, use the same patch to white balance for other lighting conditions to achieve a more consistent appearance for cases where a similar look is required.

# The ColorChecker Primer Spectrum Patches



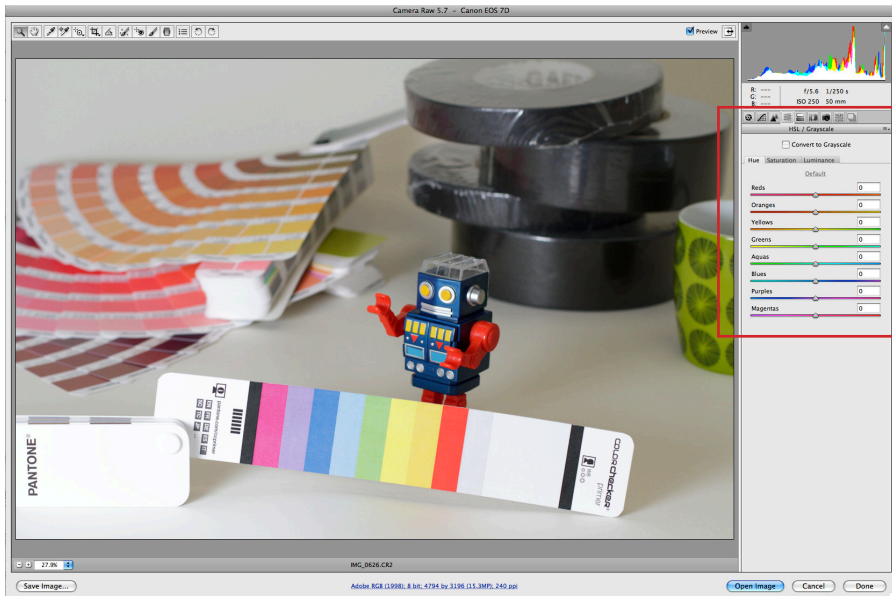
## Hue, Saturation and Lightness

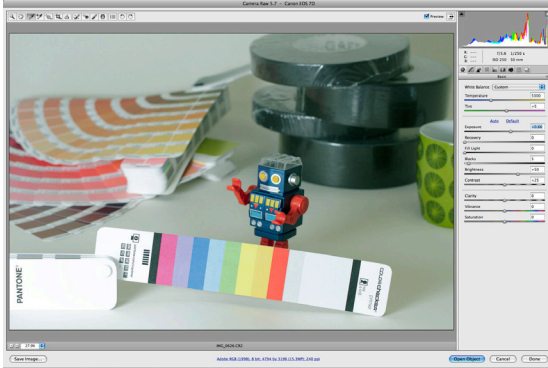
The Spectrum patches on the ColorChecker Primer provide a valuable first step in attaining consistent, predictable color. Photograph the ColorChecker Primer in the same lighting as your images; then open it in your photo processing software for a built-in point of color reference to help with color correction.

One way to describe colors is by Hue, Saturation, and Lightness (or Brightness). Most photo editing applications offer HSL sliders to help you make specific color edits to these three characteristics.

- Hue is the main attribute of color that distinguishes it from others, such as red, yellow and green.
- Saturation describes how vivid or pure a color is.
- Lightness describes a color's lightness or darkness.

These color and tone rendering controls can be used to make specific adjustments to your images within your editing software. In Photoshop, the HSL sliders can be found under Camera Raw. The fourth button is "HSL/Grayscale". In Lightroom, they are located in the "Develop" dialog.





Original image

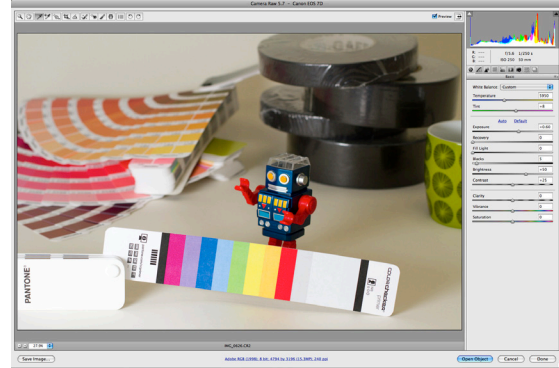


Image with corrected color

## How to Use the Spectrum Patches to Correct Color

Visually comparing the colors in an image to a physical target will help you make educated color decisions. These steps are written for Photoshop, but are almost identical in Lightroom.

When doing visual color matching, it is important to use a calibrated monitor and controlled lighting conditions to illuminate the ColorChecker Primer.

1. Open the image with the ColorChecker Primer in Photoshop.
2. Select the 'HSL/Grayscale' tab from the menu on the right hand side (this will be the fourth one from the left). Make sure the 'Hue' tab is selected.
3. The sliders on the right will roughly correspond with the HSL sliders in the Photoshop dialog.
4. To make edits, move the Photoshop sliders right to left and see how the color shift corresponds on the Spectrum patches on the ColorChecker Primer.
5. After you have made any hue changes, select the 'Saturation' tab.
6. Once again, use the Photoshop sliders to make edits to the spectrum colors. Moving the sliders to the right will increase saturation for that specific color, and moving them to the left will decrease saturation. Use the ColorChecker Primer to see the effects of your saturation moves.
7. After you have made the necessary changes to the saturation, click the 'Luminance' tab.
8. Under the 'Luminance' tab, you can use the sliders to make color brighter or darker. Moving the slider to the right will move the selected color closer to white. Moving the slider to the left will result in shifting the color towards black.
9. When you are finished making edits, save your file.



# Upgrading to the ColorChecker Passport

Once you start using the ColorChecker Primer, you will quickly realize the benefits of an accurate point of reference and creative flexibility. If you are looking for even more control from capture to editing, ColorChecker Passport may be a logical upgrade.

The patches in the ColorChecker Primer are borrowed from the more robust ColorChecker Passport solution. The entire ColorChecker Passport solution includes:

- A set of three ColorChecker photographic targets housed in a functional plastic case that's small enough to fit in your pocket, yet sturdy enough to go everywhere you go.
- The ColorChecker Passport Desktop Application to create DNG profiles for use in a Raw workflow to help you achieve consistent results from image to image, regardless of the camera and lighting environment.
- The ColorChecker Passport Lightroom plug-in for creating DNG profiles.

In the past, most camera calibration solutions required a controlled and consistent studio environment to obtain a good profile, and usually only worked for TIFF or JPEG image formats. This is no longer the case, and many of today's photographers are taking advantage of their camera's full capabilities by capturing images in Raw format.

A calibrated Raw workflow minimizes color differences between cameras and lenses, adapts for mixed lighting, and makes it possible to color match across different scenes. You also have a greater capability to calibrate and correct color because you're starting with a consistent foundation. Plus, shooting Raw enables you to apply color management to a large number of files, automatically.

If your Raw processing application does not support custom DNG profiles, you can still use the ColorChecker Passport to provide a physical reference for color editing. The targets offer such things as exposure evaluation and one-click white balancing for Raw editing packages that support these features.

For more information or to purchase ColorChecker Passport, visit [www.pantone.com/ccpassport](http://www.pantone.com/ccpassport) or [http://www.xritephoto.com/ph\\_product\\_overview.aspx?id=1257&catid=28&action=buy](http://www.xritephoto.com/ph_product_overview.aspx?id=1257&catid=28&action=buy).

X-Rite Photo has a wealth of information, videos and webinars on color management. To learn more and see the ColorChecker Passport in use, visit [www.xritephoto.com](http://www.xritephoto.com).

