



EIZO's guide to a deeper understanding of digital photography

What defines a monitor with correct display capabilities?

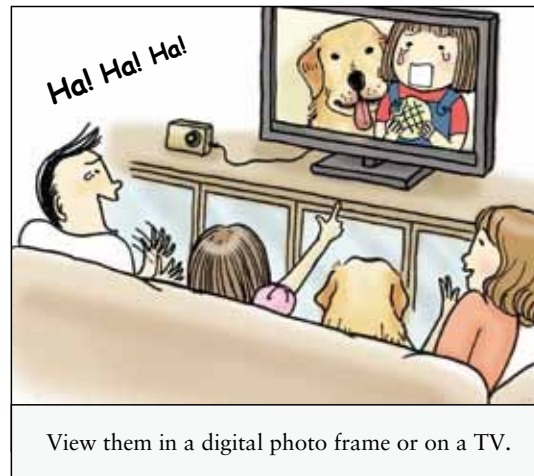
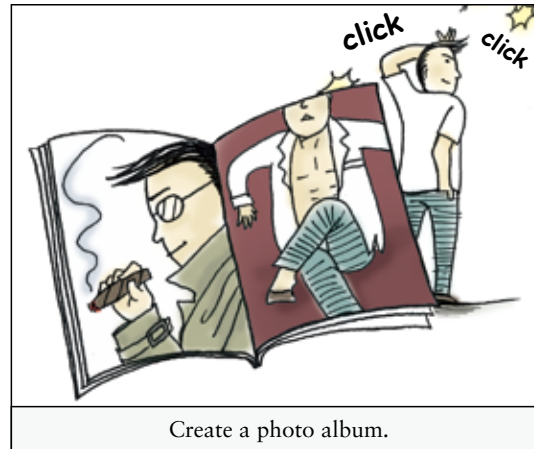
What is the ideal work environment?

What are the optimal settings for my retouch software or printer driver?



Starting today, digital photography will be more enjoyable and fun.

There are many different ways to enjoy digital images...



But displaying digital photos on a less than optimal monitor presents challenges...



The color or impression of a photo can be entirely different when viewed on a different monitor or device.



The photos may not print in the desired color, requiring repeated reprints or color adjustments.

To enjoy digital photography even more...



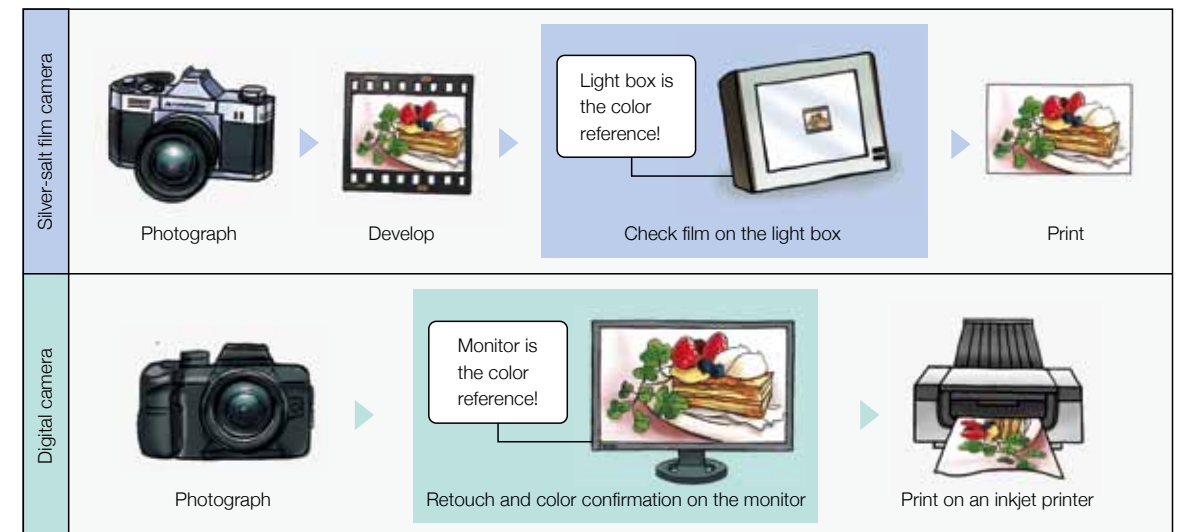
Even a beautiful photograph can be ruined if displayed on a less than optimal monitor. Retouching a photograph believing what you see on a suboptimal display will lead to making incorrect adjustments.

...You should use a monitor that is suited for display of digital photographs so you can adjust its settings as needed.



Those who realize this are ahead of the game! That's how important a monitor is.

In film photography, the color confirmed by using the light box is the absolute color reference of that photograph. In digital photography, however, the color settings on the camera's LCD, on a PC monitor, and when printed on paper, often are all different. Digital photography becomes much more enjoyable when you realize that the monitor is the equivalent of the light box - i.e. the absolute color reference.

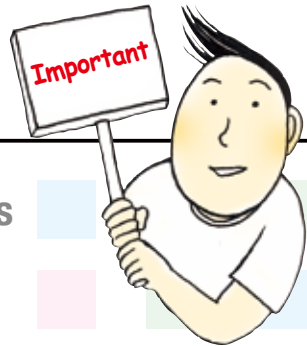


More details on the next page ▶

Short-cut to mastering digital photography. What defines a monitor with correct display capabilities?

Answer 1:


Correct color gamut



Has color gamut at least equivalent to sRGB and is capable of correctly displaying sRGB data.


Digital camera photo data is often captured in a color space referred to as sRGB. For example...

Compact digital cameras

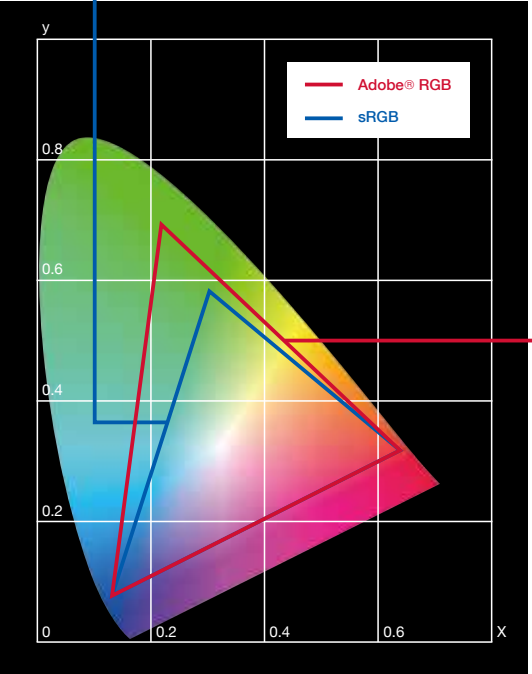


Mostly use the sRGB color gamut

Digital SLR camera




Capable of photographing in either the sRGB or Adobe® RGB color gamut



Legend: Adobe® RGB (red line), sRGB (blue line)

sRGB data (blue square) | Adobe® RGB data (red square)

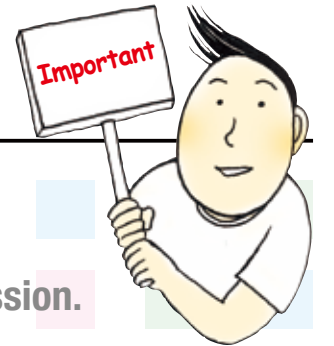


To correctly check the photo data of a digital camera, it is necessary to use a monitor that is, at a minimum, capable of correctly recreating the sRGB color gamut.

Ideally, a monitor with a color gamut equivalent to Adobe® RGB is BEST.

Answer 2:

Smooth gradation



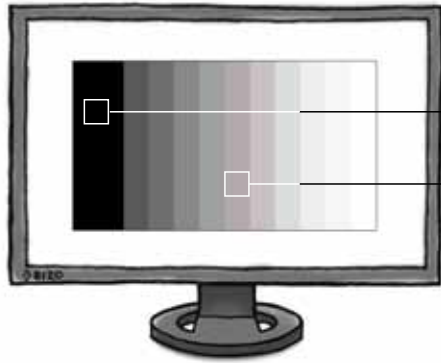
No color infusion or color omission.

Capable of accurately recreating gradation expression.

Gradation is used in photo data to express color shading and sense of depth.


A monitor with color infusion or color omission issues is unable to correctly display important elements of photographs such as contrast and sense of depth. To correctly display a photograph, a monitor that is capable of correctly displaying gradation and contrast with no color infusion or grayscale banding is necessary.

Issues with using monitors with noticeable color infusion or omission





Grayscale banding

Color infusion is observed in the grayscale tones



Is that so...





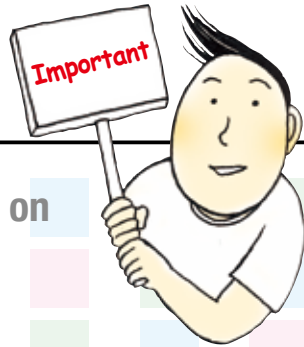
(Sample photo)

Color infusion and omission in the gradation area and/or banding of the low gradations in the shadow area occur.

Short-cut to mastering digital photography. What defines a monitor with correct display capabilities?

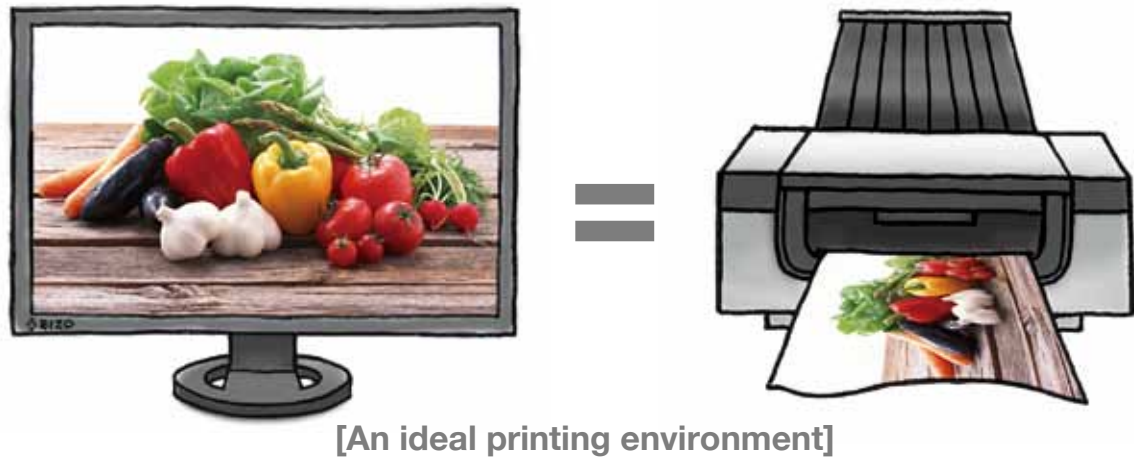
Answer 3:

Accurate adjustment



Possible to fine tune brightness and color so color on a printed page can be reproduced on the display as closely as possible.

By closely reproducing white on the monitor to match the white of the paper (color and brightness), colors on the monitor and colors on the printed page become relatively close. Therefore, it is necessary to use a monitor that allows fine tuning of brightness and color in order to bring the color of the monitor close to that of a printer.



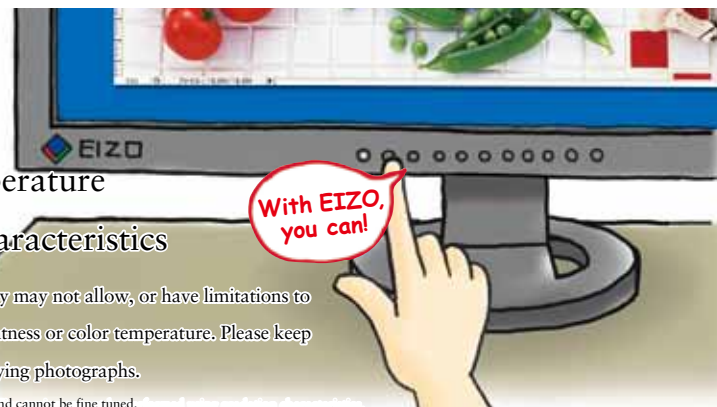
EIZO monitors allow fine tuning of brightness and color.

Three elements necessary to bring the white on a monitor close to that of the paper

- (1) Adjustment of brightness
- (2) Adjustment of color temperature
- (3) Accuracy of gradation characteristics

Many LCD monitors are not suited for this use as they may not allow, or have limitations to the amount of, adjustments that can be made to brightness or color temperature. Please keep this in mind when selecting an LCD monitor for enjoying photographs.

NOTE: Gradation characteristic depend on each monitor's performance and cannot be fine tuned.



Aim for even higher display accuracy! Adjust the monitor using specialized devices and software.

In order to make adjustments at even higher levels of accuracy, we recommend the use of equipment to measure the display status of the monitor (calibration sensor, calibrator, color measurement sensor) and special software to adjust the display based on the measured results.



Example of a monitor color measurement device

Example of monitor color measurement devices

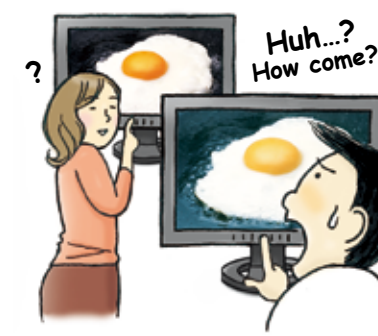
For printing photographs, we recommend the following target color measurement and adjustment values.

Luminance: 80 to 100 cd/m² (candela/m²)
Color temperature: 5000 to 6500 K (kelvin)

Accurate adjustment makes accurate utilization of image data possible!

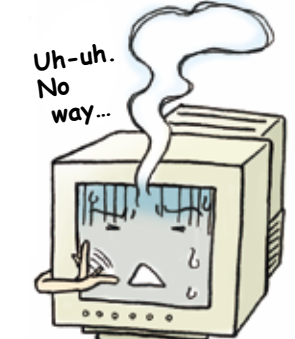
Although accurate adjustment of the monitor is possible by using color measuring equipment and specialized software, ...

It is necessary to be familiar with the equipment and have ample time to do the work.



Adjustment results may vary depending on the individual who does the work and the day the work is performed.

Some monitors also will have limitations to the level of adjustment that is possible.



So...

Let us make it easy for you

EIZO's recommended setup for photo display

EIZO's color matching tool "EIZO EasyPIX" combines a monitor measurement device and easy-to-use software.

By using this kit in combination with a supported EIZO LCD monitor, maintaining optimal color display for your digital photographs is easier than ever.

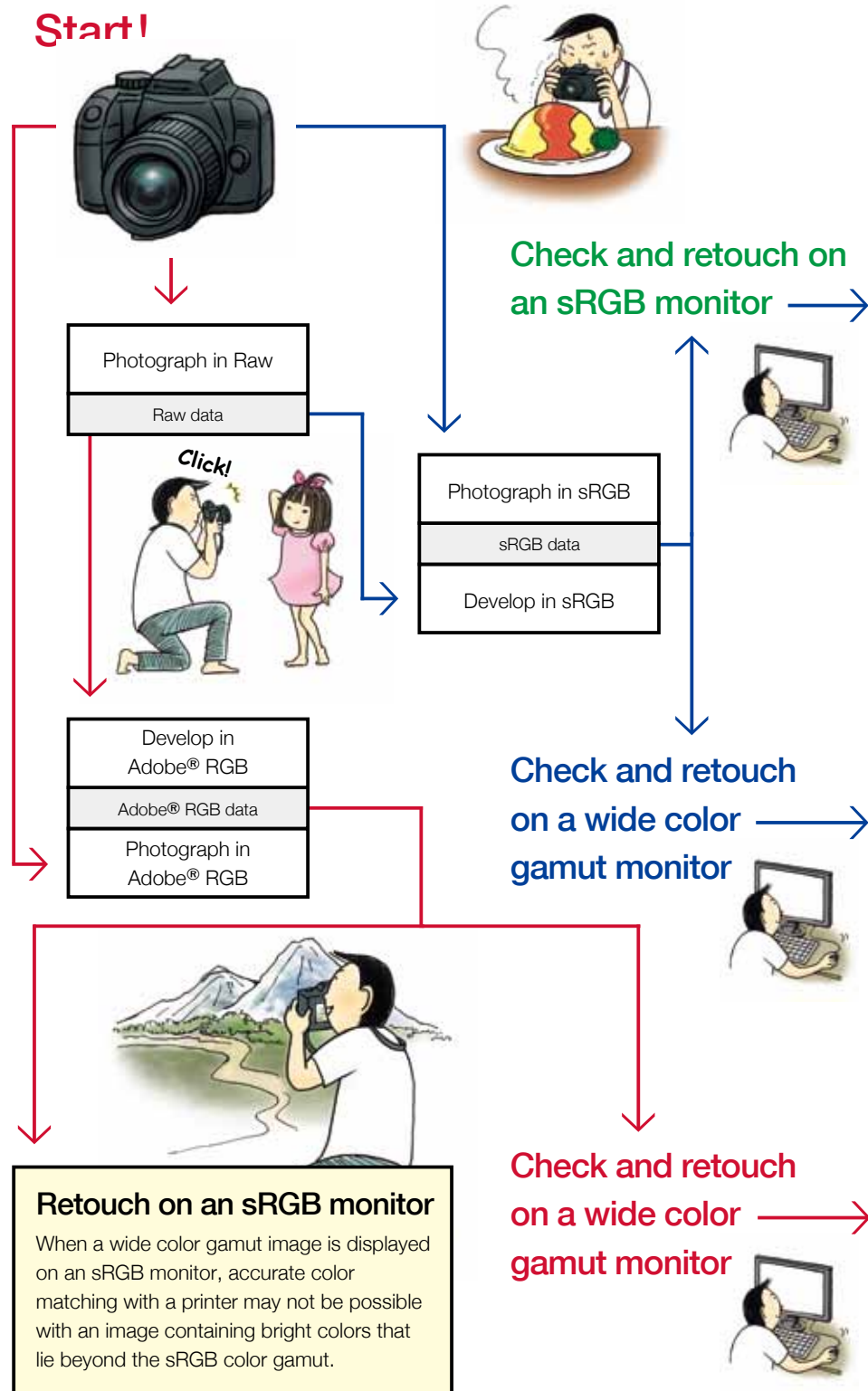
NOTE: The software can be downloaded from the EIZO web site at no charge. Even without purchasing the adjustment kit, you can try matching your monitor color with a printed page without the use of a measurement device.



EIZO EasyPIX™

For details, please visit us at:
<http://www.eizo.com/global/products/accessories/lexscan/easyPIX/index.html>

Color matching with a printer [hands-on] — Monitor and retouch software



For beginners

Data:
sRGB
Monitor:
sRGB

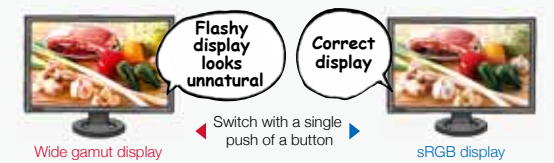
Unifying in sRGB is the safest. Color matching with a printer is easy, too.

The easiest method is to standardize everything, including the digital camera, monitor, printer, and retouching software in the sRGB color gamut (displayable color range). This makes it possible to take the pictures, display them on a monitor, and print them, all without having to worry about the color gamut of each device.



A little tutorial on monitors

To work with sRGB data, the monitor must be able to recreate the sRGB color gamut. Attention is necessary when working with monitors whose gamut is insufficient or too wide. Several EIZO LCD monitors are equipped with an sRGB preset mode. This allows a single push of a button to switch a wide color gamut monitor to display in the sRGB color gamut.



For intermediate users

Data:
sRGB
Monitor:
Wide color gamut

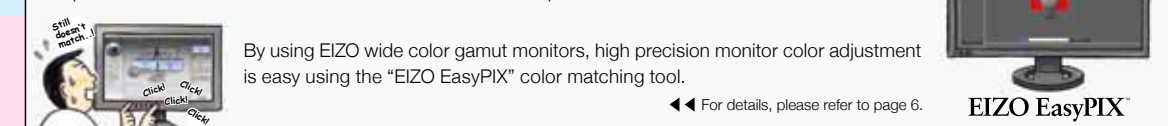
To get the details just right, ensure accurate handling of sRGB data.

When using a wide color gamut monitor, it is necessary to use a monitor adjustment tool or to enter settings in a retouching tool, even when the digital camera is set to sRGB. Even minor adjustments to the settings can improve the accuracy of monitor and printer color matching.



A little tutorial on monitors

Monitors with a wide color gamut equivalent to Adobe® RGB require precise adjustment using a color measurement device and specialized software. Monitor adjustment with a color measurement device requires time and effort before one becomes familiar with the process.



For intermediate users

Data:
Adobe® RGB
Monitor:
Wide color gamut

Beyond sRGB — the “Adobe® RGB” color gamut! But, be careful with the handling of data.

When operating with “Adobe® RGB” wide color gamut data, which has a much wider color gamut than sRGB, it is essential to calibrate the monitor using a measurement device. With appropriate settings in the retouching software, it is possible to enjoy brilliant color display that cannot be expressed in sRGB.



What is the ideal environment when working on digital photographs? It's actually quite important.

The key elements are

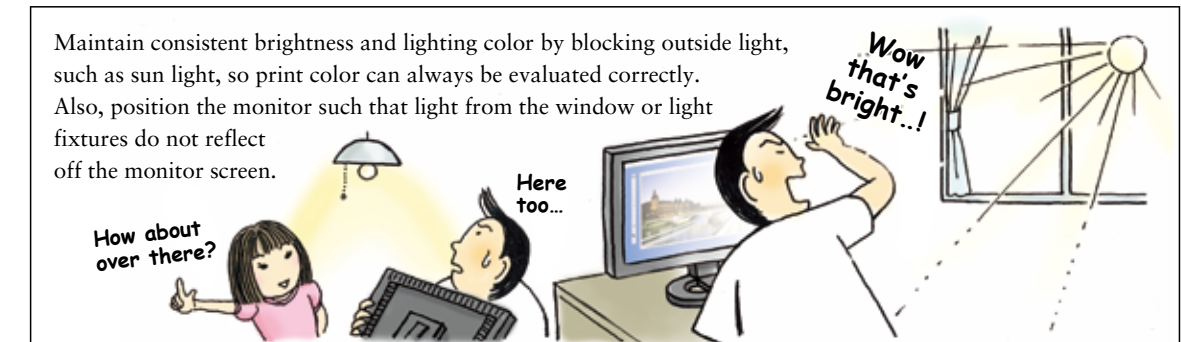
“outside light,” “artificial light” and “surrounding color”

Unlike a monitor screen that emits light at a consistent brightness, a printed image can look very different depending on the lighting condition under which it is viewed. To match the color of the monitor and a printed image, it is necessary to adjust the lighting condition by blocking outside light, such as sun light, so printed images always can be evaluated under the same condition.



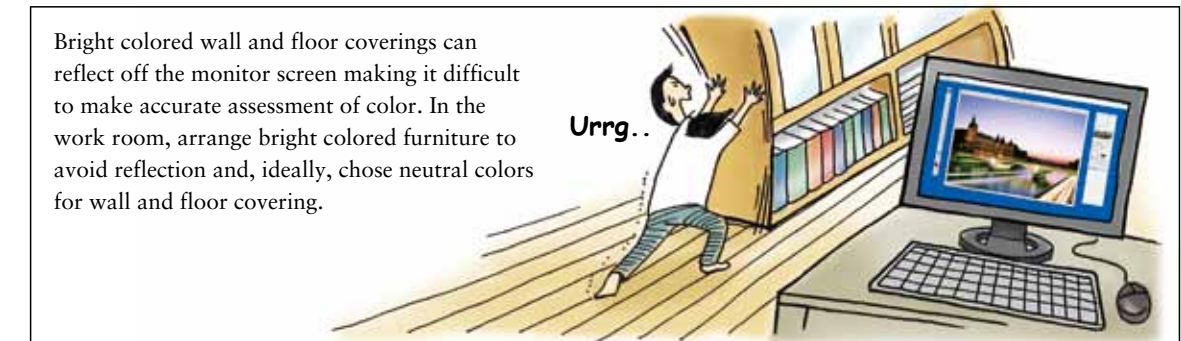
Point 1: Environmental light

Maintain consistent brightness and lighting color by blocking outside light, such as sun light, so print color can always be evaluated correctly. Also, position the monitor such that light from the window or light fixtures do not reflect off the monitor screen.



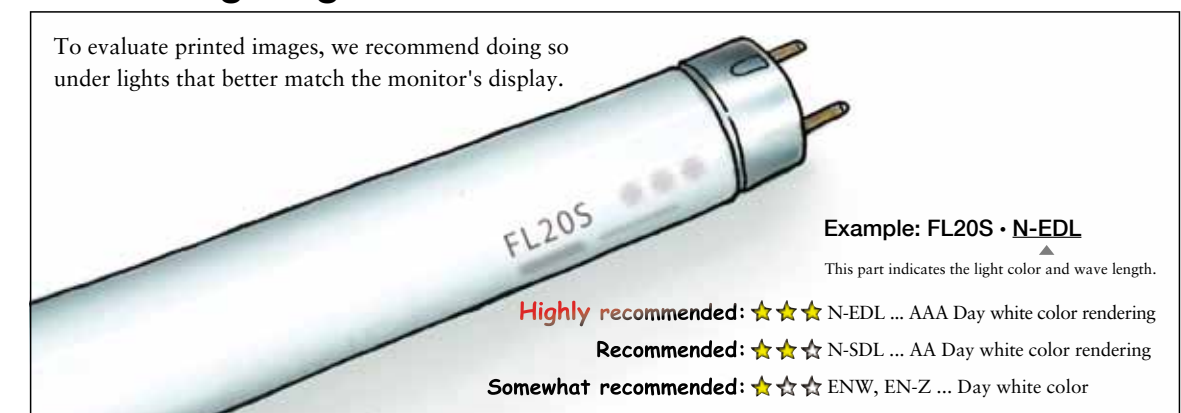
Point 2: Reflection

Bright colored wall and floor coverings can reflect off the monitor screen making it difficult to make accurate assessment of color. In the work room, arrange bright colored furniture to avoid reflection and, ideally, chose neutral colors for wall and floor covering.



Point 3: Lighting for evaluation

To evaluate printed images, we recommend doing so under lights that better match the monitor's display.



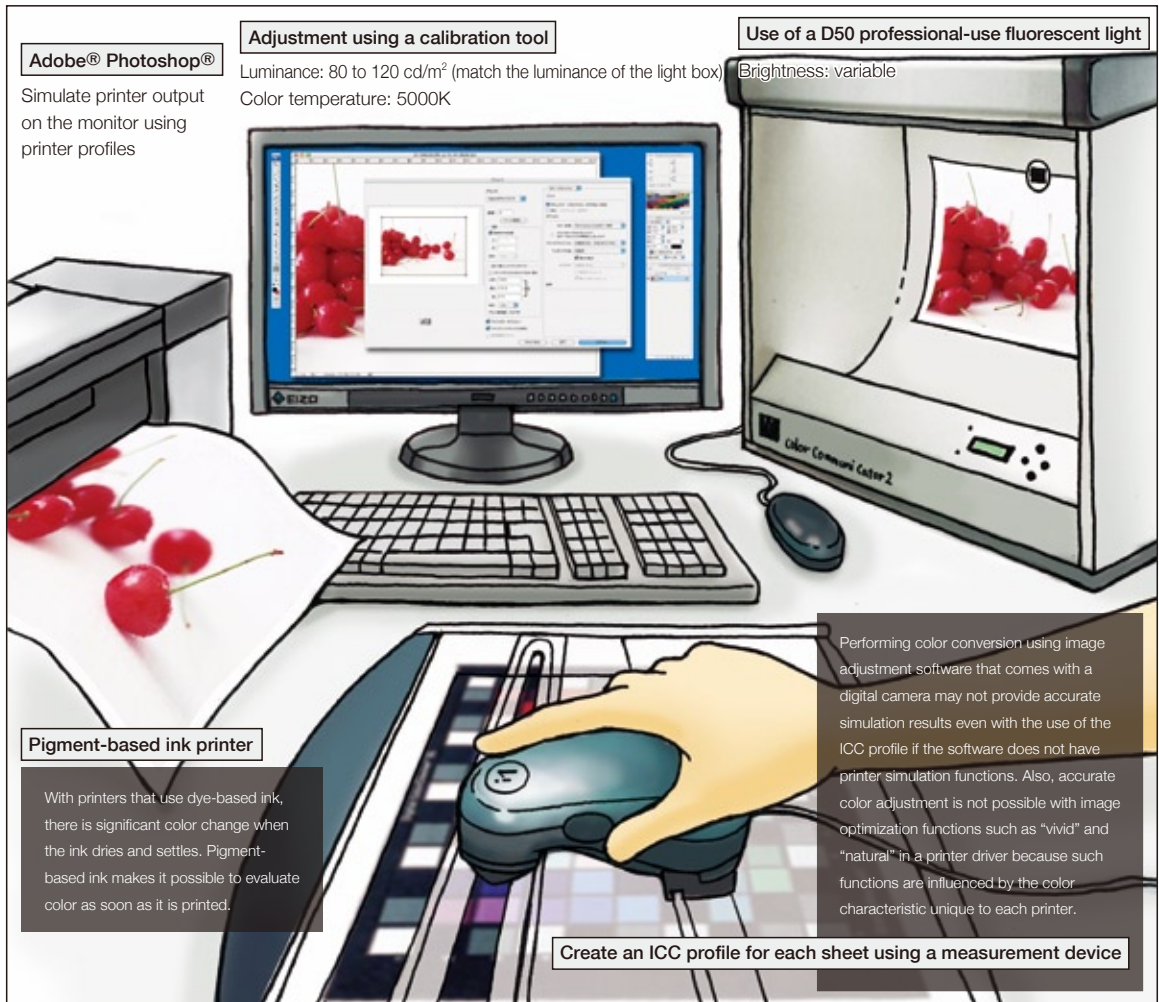
Point 4: Monitor adjustment that matches the environment

Finally, by adjusting the monitor according to the environment in which prints will be evaluated, color matching of the monitor and prints can be performed with higher accuracy.



There's a lot more to digital photography than you think. What do the pros do?

Even the pros struggle with the color mismatch between what is displayed on a monitor and what is printed on paper. Professional photographers and printers invest time and money to accurately match monitor display and prints. Specifically, they obtain adjustment (calibration) and display color profile data for the LCD monitor as well as for the printer and use software such as Adobe® Photoshop® to recreate print color on the monitor screen.



In professional and commercial photography to high-end amateur use, EIZO LCD monitors are chosen and used around the world for digital photography work.



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