



# Color Management Handbook

Strategies to master color management  
in the digital workflow  
Start applying them today

ver. 3



# Is that really the correct color?

“Is this color good to go?”

— A hesitation we often have before making prints in the digital workflow.



## Photographer

Is the image displayed on the monitor really accurate?



## Retoucher

Is the photograph edited the way it was intended?



## Designer

Are the application settings on the monitor correctly adjusted and does the color match the printed image?



## Printer

Do the colors in the design comp and color proof match?



# The Benefits of Color Management in Practice

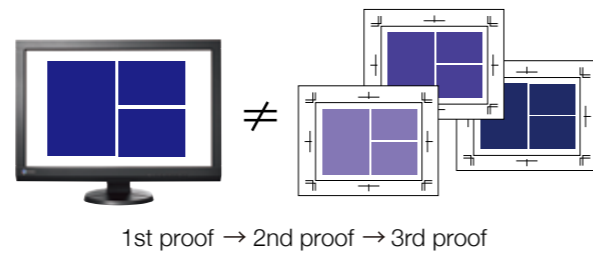
Preparing an environment for color management involves installing the appropriate machinery, adjusting settings, and deciding and sharing rules for color management with work staff to remain consistent. While it may be a challenge, we will show the benefits of using a color management system in the creative workflow.

## Benefit 1 Communication between front-end and back-end of the process is smooth

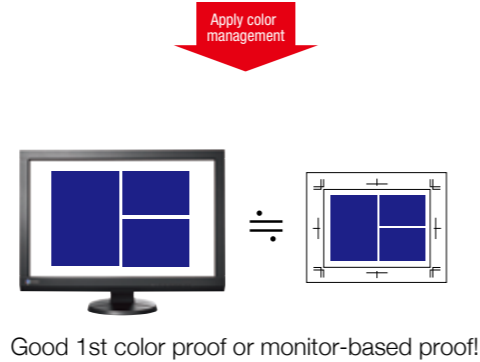
### 1 Photographer / Retoucher Illustrator



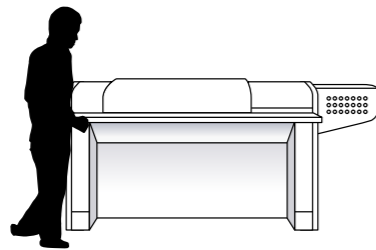
## Benefit 2 Reduce cost and time associated with reprints and multiple proofs



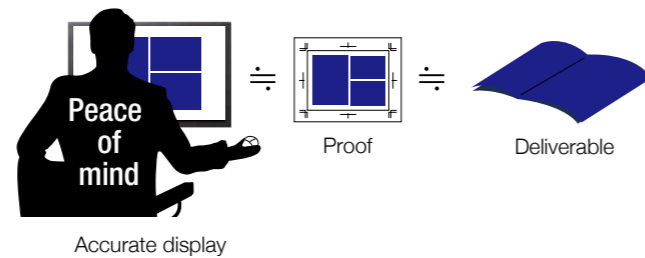
### 2 Design company



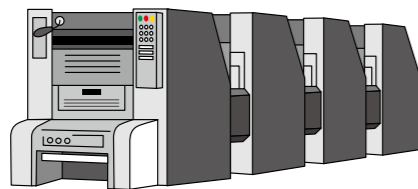
### 3 Plate making company



## Benefit 3 Gives you peace of mind as you work



### 4 Printing company



Unified image

You can increase the quality of the final product with these benefits.

# The key points in production steps.



What should we be careful about to ensure that data is handled correctly in each process leading up to the finished product? We will deal with each production step separately. By referring to these steps, you can greatly increase your color management accuracy.

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# Photographer

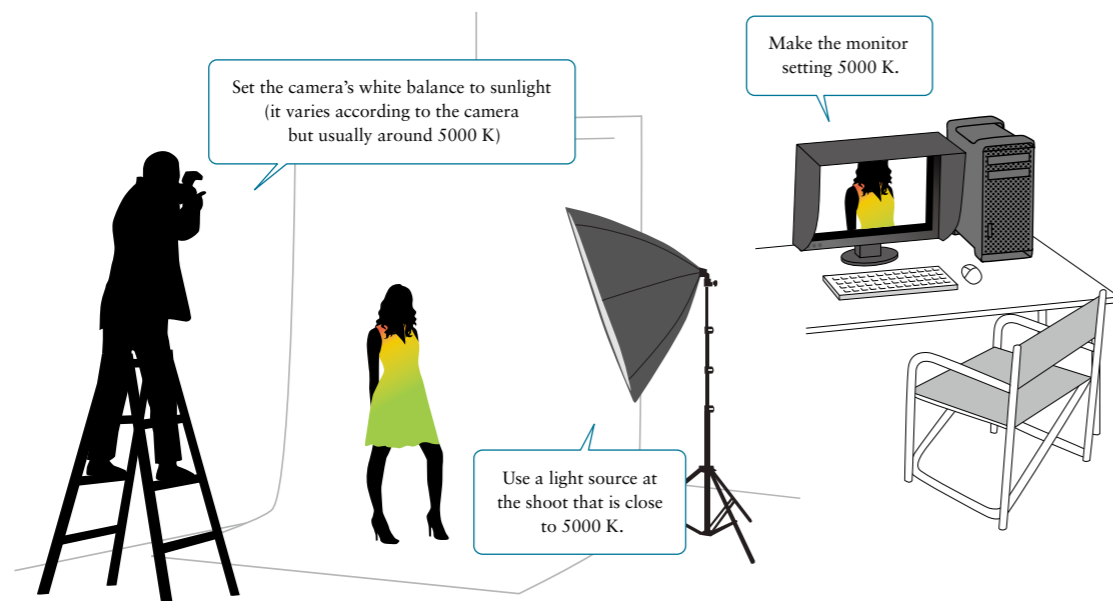


## Photography

### Photograph under a 5000 K light source with printing in mind

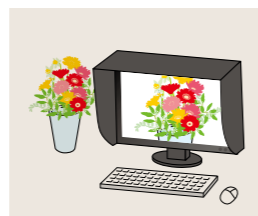
In ISO international standards and Japanese printing standards, “D50” is adopted as the light source for evaluating the color tones in printed materials. This value, determined by sampling based on the human sense of color, is a color temperature of 5000 K. For proper color management it is vital to keep this 5000 K in mind right from the photography stage.

It is possible to maintain color consistency from the photography stage to printing by making the color temperature of the light source during the shoot as close to 5000 K as possible, and by using 5000 K as a yardstick in the white balance settings of the camera and in the RAW development.

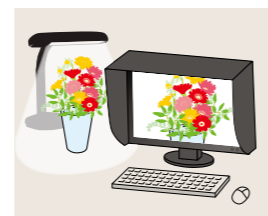


#### Key points when comparing the subject at the shoot and how it looks on the monitor

Use a fluorescent light designed for color appraisal when you compare the subject and its image on the monitor at a shoot. The color temperature of the fluorescent light is important, but you must pay just as much attention to the color rendering index (Ra). Accurate color reproduction requires Ra90 or above. The colors of the monitor and the subject will match when viewed in fluorescent light with high color rendering properties.



Modeling lamps with a low color temperature are usually used in studios.



If you illuminate the subject with a fluorescent desk lamp designed for color appraisal, the colors will match those on the monitor.

# Retoucher

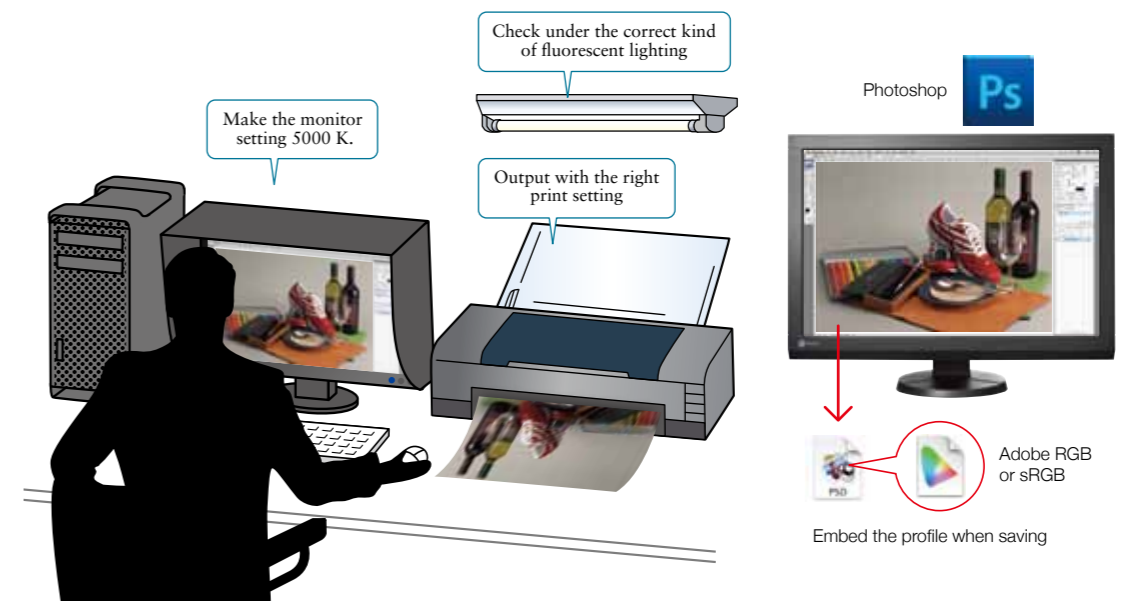


## Retouching

### Embed the profile while working in a correctly lit environment

The document profile (source profile) used in the digital printing workflow is Adobe RGB or sRGB. The white point in these profiles is set as D65 and, based on this, some people hold that the color temperature of the monitor should be 6500 K. However, as was stated earlier, ISO and Japanese printing standards stipulate viewing under D50 light source and in

Photoshop, the white point is also processed at 5000 K. When retouching photographs, it is essential to prepare a 5000 K work environment that accords with these standards. In addition, always embed the profile when saving a file so that the colors of the image can be accurately conveyed to the back-end of the process.

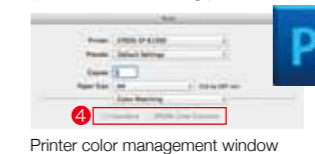


#### Settings for color sample comp output and proof printing

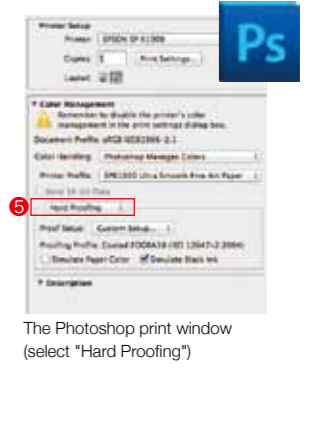
When outputting a color sample comp to send to the back-end printing process, ① select “Normal Printing” in the Photoshop Print dialog box and ② choose “Photoshop Manages Colors” for color handling and ③ specify a printer profile compatible with the paper. When you do so, ④ make sure that ColorSync is checked. However, in the case of proof printing (color proof), select ⑤ “Hard Proofing” instead of “Normal Printing”. This automatically sets the CMYK working space of the Photoshop color settings as the proof’s profile so, depending on the printing method, choose Coated FOGRA39 for a sheet-fed press or Web Coated FOGRA28 for a rotary press.



The Photoshop print window (select “Normal Printing”)



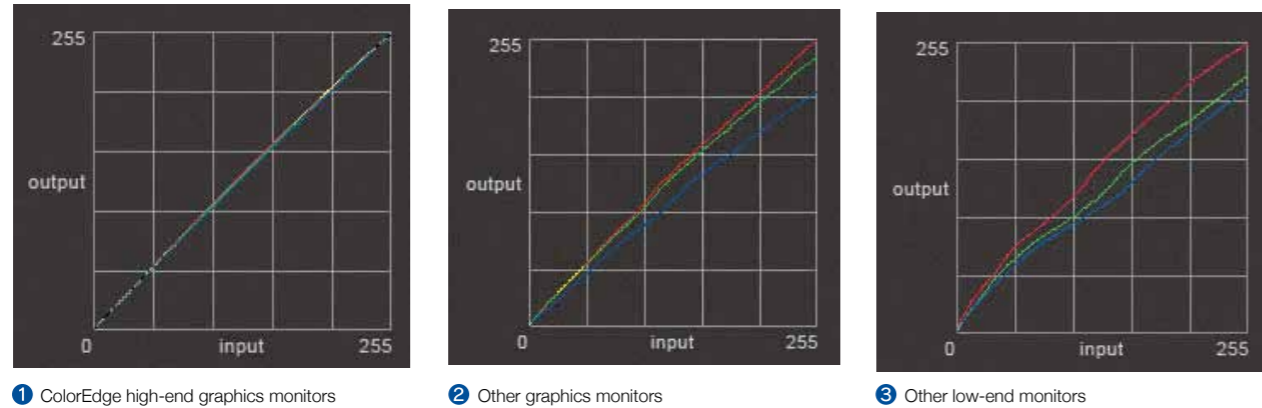
Printer color management window



The Photoshop print window (select “Hard Proofing”)

# Use a display monitor specifically for color management.

## Why is a dedicated monitor necessary?

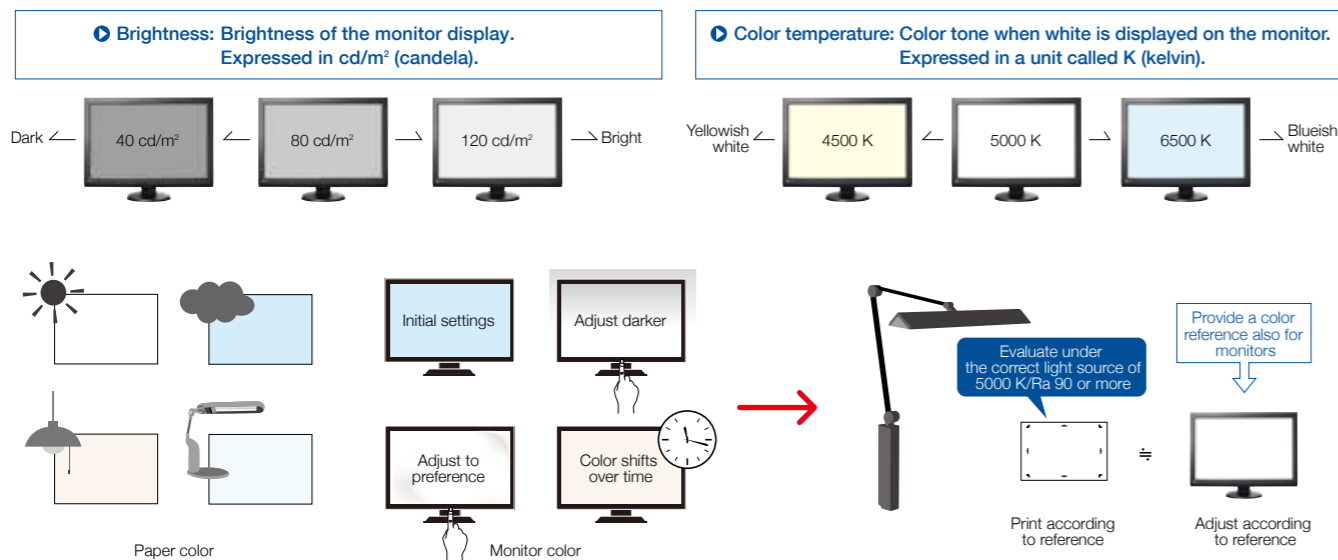


There are many different types of LCD monitors, from inexpensive ones to high performance models. However, the display properties of the monitor are very important for accurate display and proper color handling. The ColorEdge series shown in 1 has clear gradations for each RGB color, but the monitors shown in 2 and

3 have uneven and fluctuating gradations. This not only means that they cannot display images correctly, but there is also the danger of corrupting good quality data. It is essential to employ a display monitor specifically for color management in the digital workflow.

## What is monitor color?

Of the many adjustable color settings, “brightness” and “color temperature” are especially important.



Just like the color of paper can look different depending on the lighting conditions, different monitors will display different colors. Correct use of color is possible by adjusting the monitor to the reference.

## Using a dedicated monitor

### Point 1 Individual adjustment prior to shipping

Every ColorEdge monitor is individually adjusted at the factory for displaying the entire RGB color space, giving each one a smooth, consistent display.

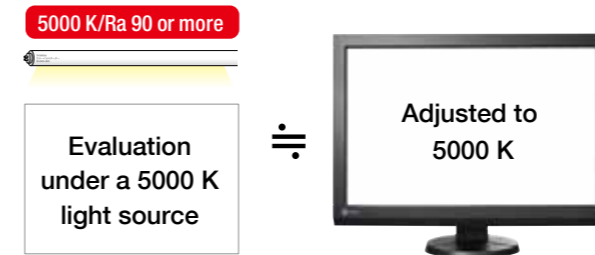


### Point 2 Dedicated circuit for display correction

Sometimes LCD monitors may display uneven levels of brightness and color across the screen. Monitors with a dedicated circuit to rectify this enables work efficiency with a uniform display.

### Point 3 Easy setup using dedicated software

When print output is being evaluated in a 5000 K environment, adjusting the monitor to 5000 K enables good color matching and correct use of color. ColorNavigator, dedicated calibration software for ColorEdge, facilitates accurate and quick monitor adjustments to the target color temperature and brightness.



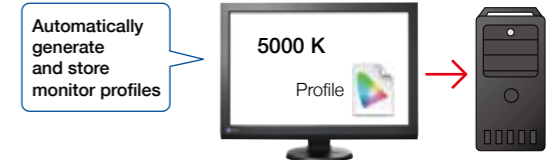
## ColorNavigator



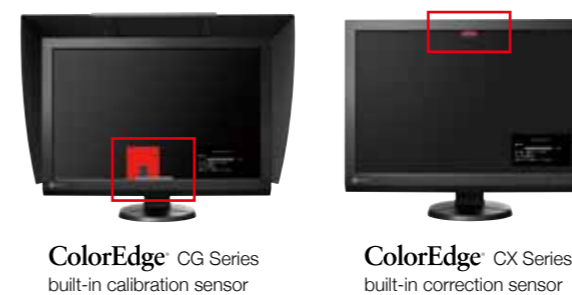
A high-precision calibration can be performed in just a few minutes by simply choosing the 5000 K and 80  $\text{cd/m}^2$  target values that were set previously.

## Automatically generate accurate profiles

Setting an accurate monitor profile is essential for accurate color matching. With its dedicated calibration software, ColorEdge is able to automatically generate and store an accurate profile.



### Point 4 Color management with an automatic internal sensor

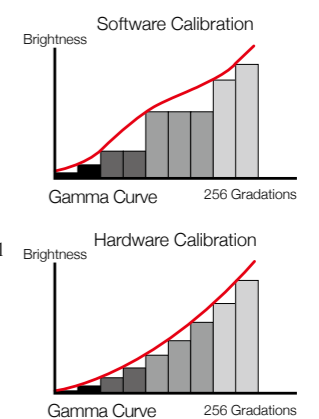


The newest ColorEdge models come with a built-in sensor that automatically adjusts the monitor at user-determined intervals. This gives the user a consistent display that is easy to setup and maintain.

## Hardware calibration that doesn't sacrifice gradation expression is possible with ColorEdge.

ColorEdge uses ColorNavigator, its dedicated calibration software, in combination with a commercially available sensor or the in-built sensor, so the monitor's internal settings are adjusted directly and its color display adjusted. This is known as hardware calibration.

Unlike software calibration, where computer output is adjusted in a general purpose LCD monitor by a combination of a commercially available calibration sensor and software, hardware calibration performs more accurate monitor adjustment with no gradation loss or color shift.



# Designer

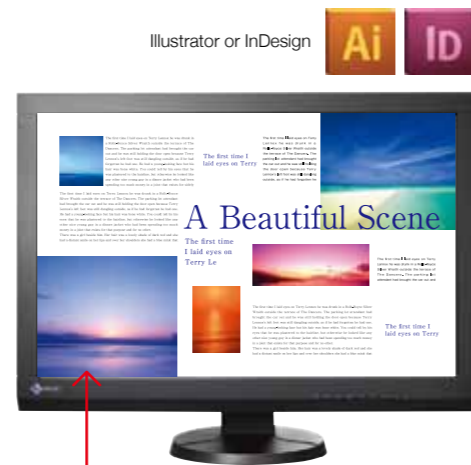
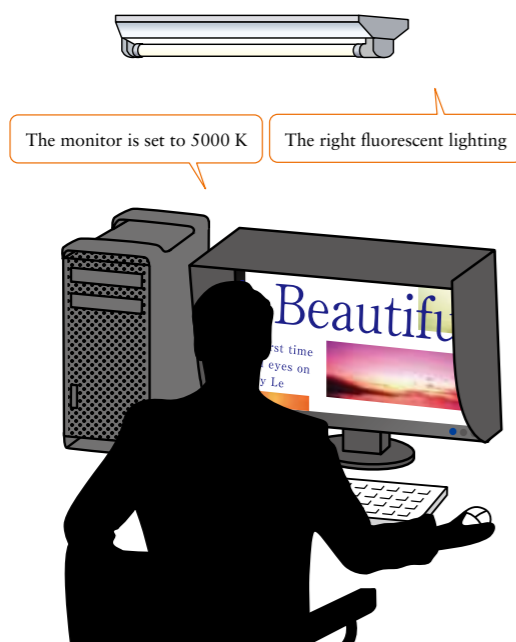


## Design

### Design with the colors as they are on the monitor

Color management has seen revolutionary changes in both the input (photography, scanning etc.) and output (printing) processes. However, in the design process, which lies directly between them, the traditional method of determining colors by CMYK values is still going strong, while there are many cases where people who use monitors with a low level of accuracy are swayed by their visible

perception of the colors. However, by using a monitor with excellent tone and color reproducibility, and introducing color management, it becomes possible to simulate the print finish on the monitor. Both creativity and productivity are boosted when design work is just as it's shown on the monitor.



Arrange PSD or TFF files embedded with the profile just as they are.

#### Use the same profile embedded in the image in the design process.

Sometimes the profile embedded in the photographic data is deliberately removed by the designer. This is probably due to an incomplete understanding of systemic color management. Removing an image's profile puts the colors in an undetermined state and can cause problems in the back-end process. It is important for the designer to use the photographic data as it is, without removing the profile. The safest way to do it is to select "Europe Prepress 3" in the InDesign or Illustrator color settings.



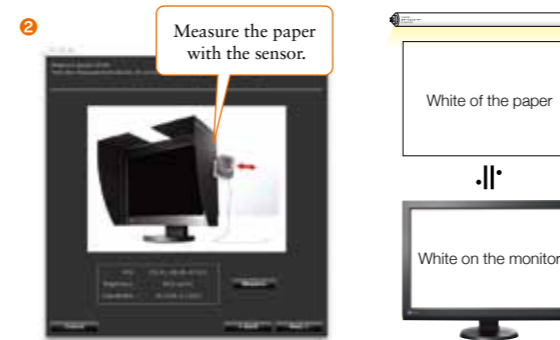
The InDesign color settings

# Adjust the monitor to match printed material.

## case 1 Color matching between prints and monitor

Color matching between the printed material and the monitor (evaluate side-by-side) can be done by:

- 1 Calibrating the monitor using target values that have been standardized under a 5000 K light source as described on Page 11, to create and set the monitor profile
- 2 Adjusting the monitor so the white of both the paper and monitor match (Paper White Measurement\*)



Either method can be used with ColorEdge.

\* The ColorEdge internal sensors cannot perform paper white measurement. To use this method of measurement, it is necessary to prepare a separate external calibration sensor.

### ColorNavigator's manual adjustment function makes fine tuning white color very easy!

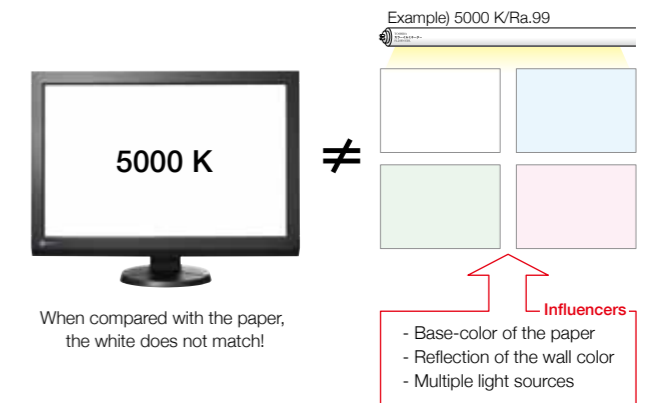
With ColorEdge, fine tuning the display is possible even after calibration. By visually reselecting the white color, it is possible to derive a calibration target value that is better suited for the matching application.



Just move the pointer towards the desired color. The white color is adjusted accordingly!

## case 2 Fine tuning after adjusting to 5000 K

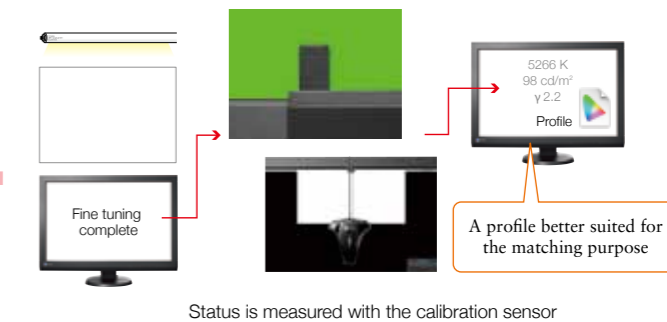
Even with the color temperature of the monitor set to 5000 K, its white may still not match that of the paper. In this case, fine tuning the monitor's white to match the paper will improve color accuracy.



In this case, fine tuning the monitor's white to match the paper will improve color accuracy.

### It is possible to regenerate profiles to match the objective.

With ColorEdge, it is possible to regenerate a profile to better match the objective by performing a remeasurement based on the target values obtained from manual fine tuning.



Repeats status measurement and profile generation upon completion of fine tuning.

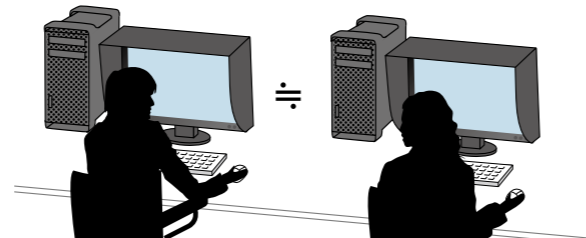
# Matching the monitor color for all workers.

Color quality in the digital workflow can be improved by matching the color of each monitor and having the workers share a common image. There are also two methods by which the color of monitors may be matched.

**case 3** Matching them to the printed output

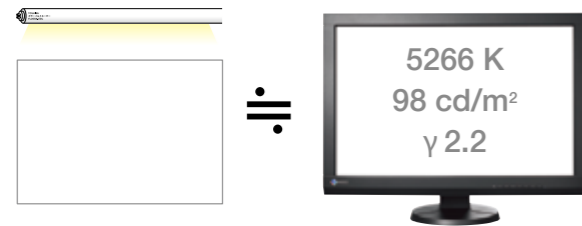
**case 4** Matching them to an industry reference value

By using each of these methods appropriately for a given purpose, accuracy in the use of color can be improved.



## case 3 Matching them to the printed output

Not compatible outside the company but very convenient for in-house color unification!



By taking the adjustment value to match the white of the printer paper obtained in **case 2** and applying it to all monitors in the company, theoretically, the display color of all monitors will be matched.

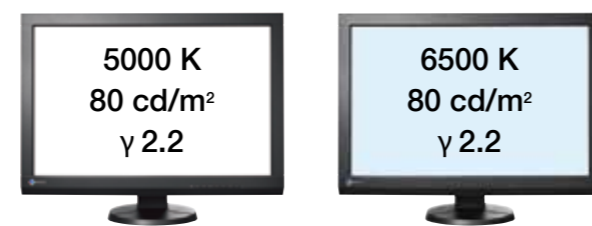
Settings may be slightly different between each monitor due to model differences.



With ColorEdge, ColorNavigator makes it easy to share target values between different monitors using its target adjustment value import/export function.

## case 4 Matching them to an industry reference value

Provides a high level of compatibility but may not match print output.



By adjusting all in-house monitors to an industry standard, a basic color management environment can be established. This may not meet necessary requirements in terms of matching with actual print output.

5000 K 80 cd/m² or above γ2.2 [ISO 12646]

[ISO12646] is a core standard for "soft proofing", the practice of performing print color proofing on a monitor. The Japanese printing industry also often follows this standard.

[ISO 12646:2008] Characteristics of a proofing monitor and observation conditions

6500 K 80 cd/m² γ2.2 sRGB standard

An international standard on color gamut. A standard set for CRT monitors, but many manufacturers still conform to this standard. The large installed base provides high compatibility thus making it useful in applications such as web content development.



With ColorEdge, it is possible to store monitor adjustment settings for each application and easily switch between them depending on the job.

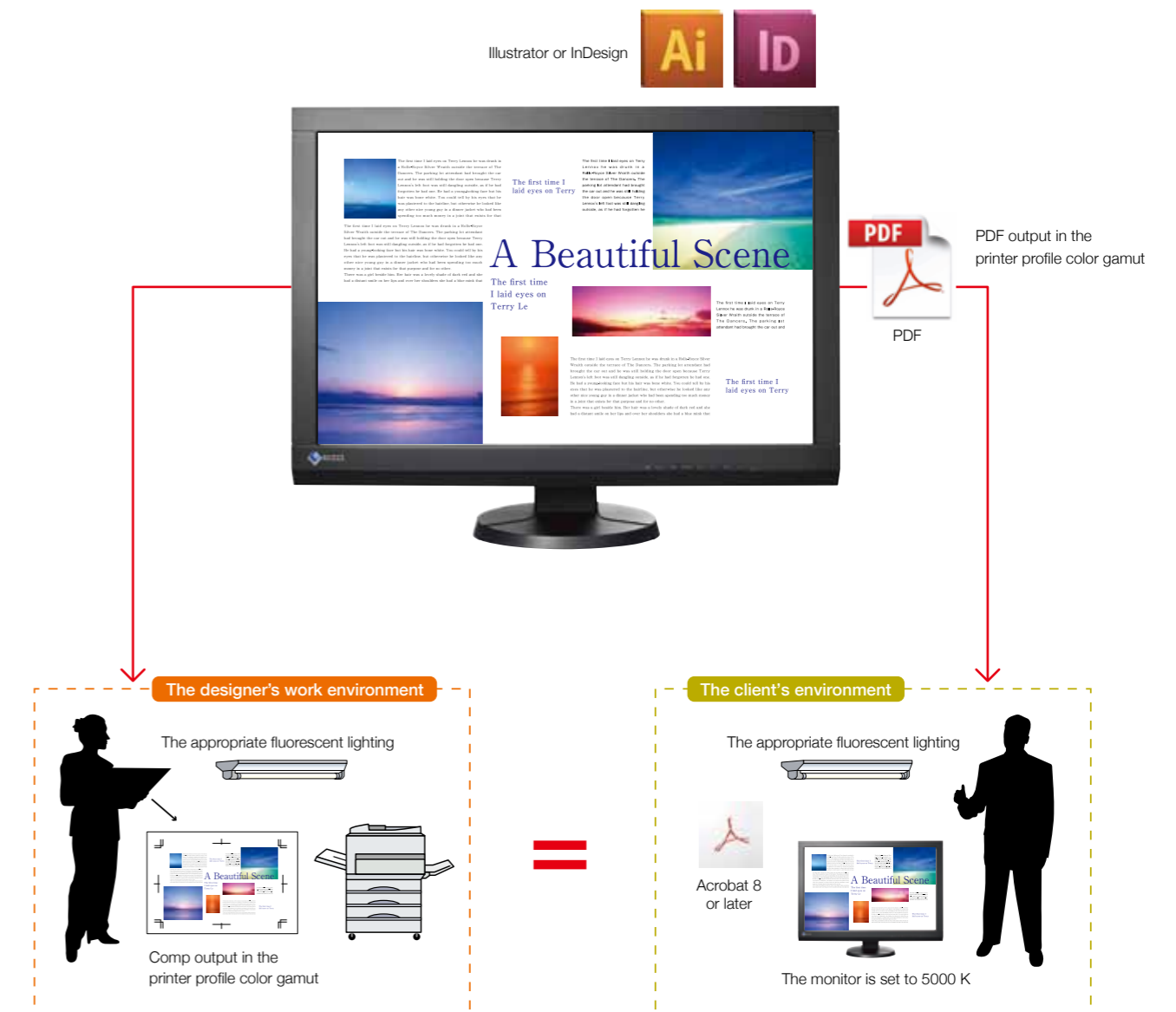
- 5000 K 80 cd/m² γ2.2
- 6500 K 80 cd/m² γ2.2
- In-house matching
- Communicating with design company A
- Data submission to printing company B
- For sRGB workflow
- etc.

# Comp and PDF

## Output a comp and PDF based on the printer profile

Once the design is finished, the comp is output using a laser printer or inkjet printer. This is a very important stage where the designer and the client both look at the printed output and do a comprehensive check of the composition, color coordination and so on. This cannot be done efficiently if the color tones on the monitor and in the comp output are different. Recently it's

becoming more common to export a PDF file and send it to the client. This is a very convenient way of doing things if the printing colors can be simulated at the PDF stage. Outputting a comp and PDF based on the printer profile makes it possible to share the finished image with the client.



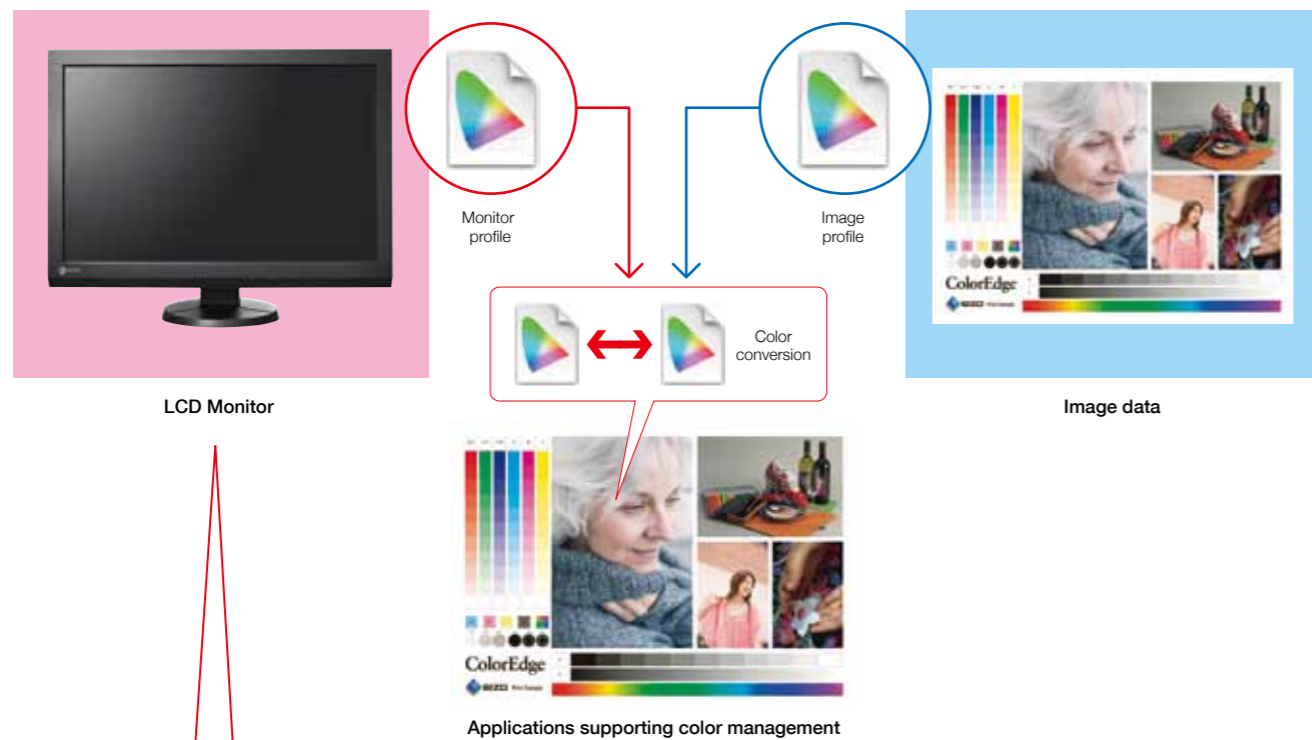


# Display using applications that support color management.

## Displaying images using applications

For accurate color management, it is necessary to check the data and simulate printing on the display using applications that support color management.

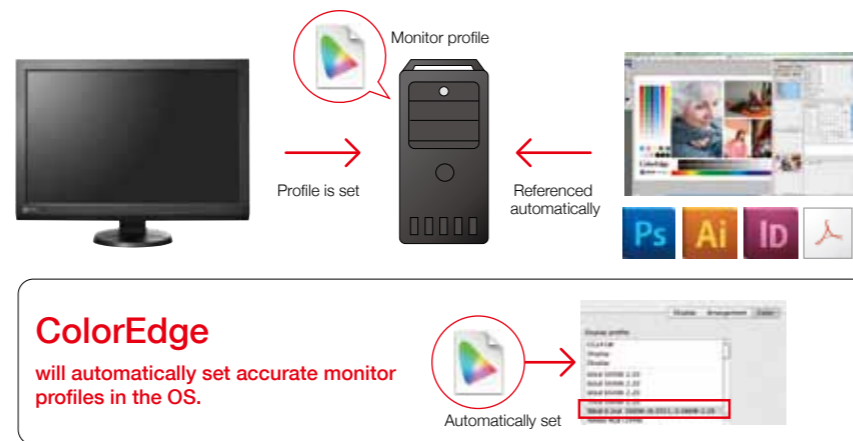
To correctly view an image in accordance with color management rules, the application must load each of the profiles for the monitor and the image, and perform accurate color conversion.



## Loading the monitor profile

Applications that support color management will automatically load the monitor profile set in the OS.

**NOTE:**  
Some applications may require manual setup.



## STEP 1 First, check the application's color settings

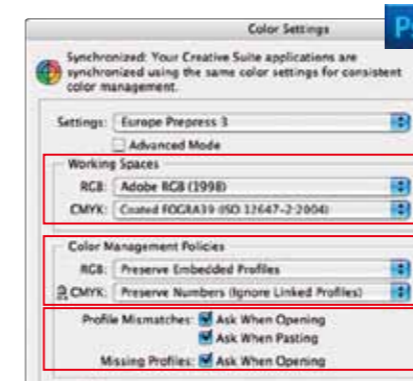
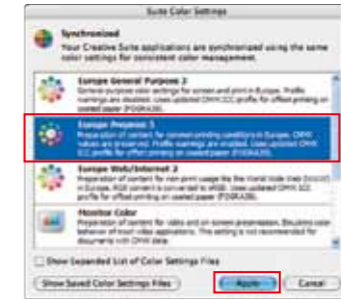
For precise color utilization, color settings are first adjusted to the requirements of each job.

You can adjust the color settings in any software individually, but with Adobe Bridge you can save settings across all Adobe programs at once. Bridge is useable with CS2 and above.

Open Creative Suite and select "Creative Suite Color Settings" under Edit. A window for selecting settings for all applications will appear.

Select Europe "Prepress 3" and click "Apply".

The color settings you choose in Bridge will stay consistent with every Adobe application so "Europe Prepress 3" will also carry over.



### < Recommended Photoshop color settings >

Select "Color settings" under "Edit".

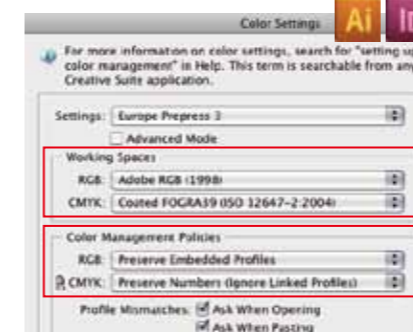
#### Working Spaces

It is convenient to have the profile for your normal digital workflow set up in advance.  
RGB: Typically, "sRGB" or "Adobe® RGB".  
CMYK: Select according to the color standard used in the workflow. When re-embedding the image profile, make selections based on the back-end workflow and the type of end deliverable.

#### Color Management Policies

For both RGB and CMYK, select "Preserve Embedded Profiles."

Select all check boxes so it is possible to make positive identification either when files that have embedded profiles do not match the "Working Spaces", or when files without an embedded profile are being opened. (Recommended)



### < Recommended Illustrator/InDesign color settings >

Select "Color settings" under "Edit".

#### Working Spaces

It is convenient to have the profile for your normal digital workflow set up in advance.  
RGB: Typically, "sRGB" or "Adobe® RGB".  
CMYK: Select according to the color standard used in the workflow. When re-embedding the image profile, make selections based on the back-end workflow and the type of end deliverable.

#### Color Management Policies

For RGB: select "Preserve Embedded Profiles."  
For CMYK: select "Preserve Numbers (Ignore Linked Profiles)."

- CMYK differs from RGB in that it does not define color spaces, but prioritizes percentage values.

## STEP 2 Open the image file

### Loading the image profile

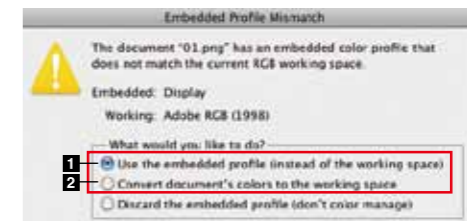
To open an image file correctly while referencing a profile, select one of the following two methods.

- 1 Use the profile embedded in the image.
- 2 Use the profile specified in "Color settings".

In normal digital work, the embedded profile should be used by selecting method 1.

#### 1 Use the profile embedded in the image

When opening the file in the application, select "Use the embedded profile (instead of the working space)". By maintaining the embedded profile, an image can be handled with the same color setting throughout the digital workflow. When a file's embedded profile matches the working space, checking is not necessary as the file opens automatically.



This screen will appear if you attempt to open an image that does not match the Photoshop working space.

#### 2 Use the profile specified in "Color Settings"

The image can be viewed in the working space specified in the application's "Color Settings". This is a useful function utilizing data that come from various external organizations or devices, or when it is necessary to switch profiles depending on the back-end process.

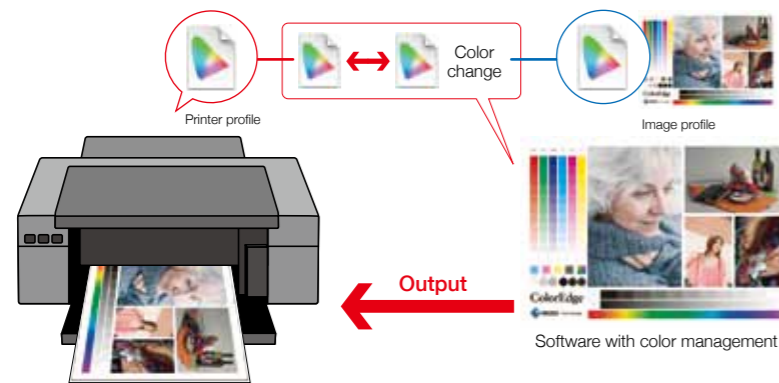
# Output a comp to a printer with the correct settings.

For precise color management it is necessary to prepare the printer you will be outputting the comp to with the correct settings.

case 1

## Using an inkjet printer

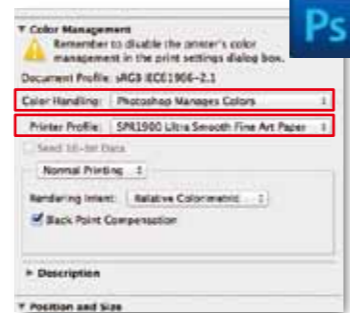
In order to manage colors using your image software, you must specify a printer profile. While referring to the printer profile and the image profile within the software, we can change the colors for output.



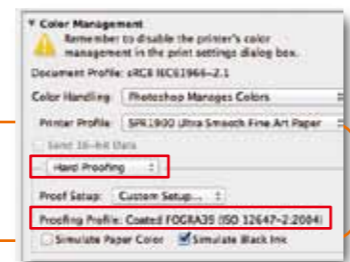
### Using an inkjet printer to print proofs

If you want to use an inkjet printer to print color proofs for work, select "Hard Proofing" instead of "Normal Printing." Then, by selecting "Coated FOGRA39", you can print with the colors as they are on the monitor.

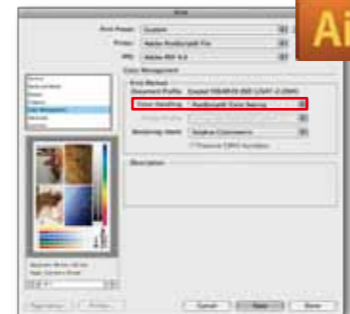
### Photoshop print settings



Choose "Photoshop Manages Colors" under Color Handling and the paper profile you will be using under Printer Profile

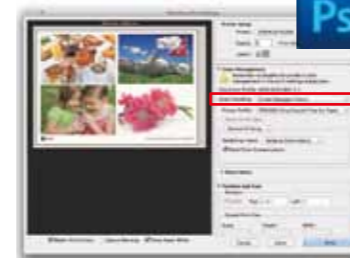


### Illustrator print settings



Select "PostScript color settings" for Color Handling

### Photoshop print settings



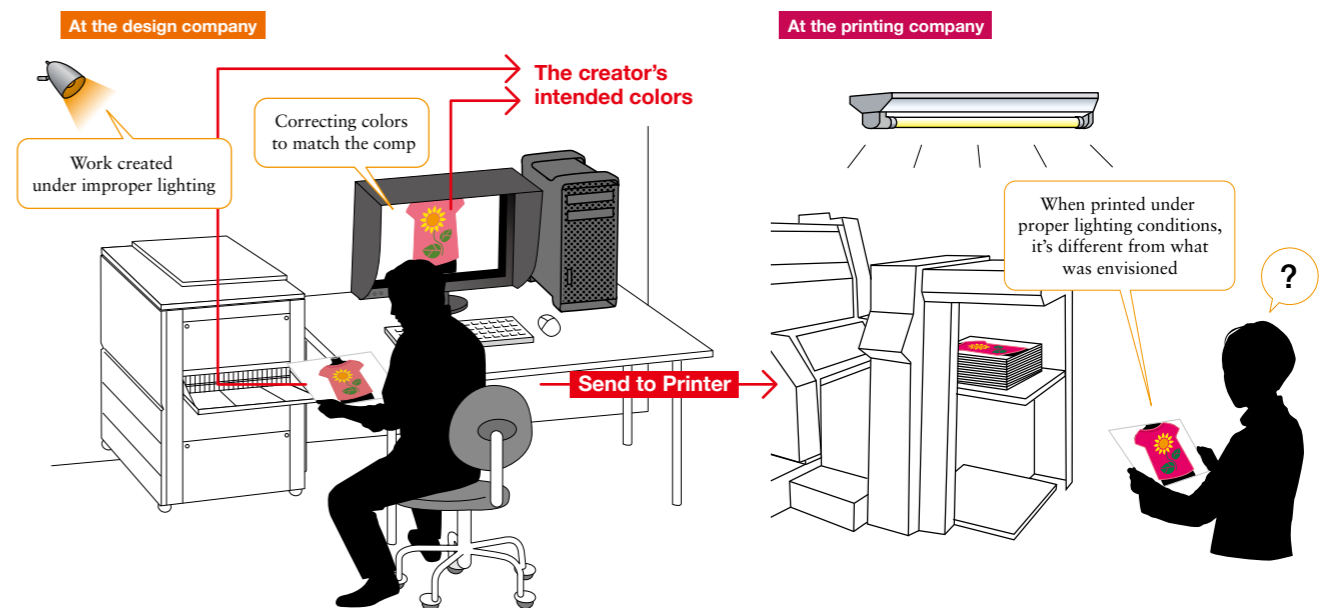
Select "Photoshop manages colors" for Color Handling

# Check the color under the correct light source.

## Why the light source must be controlled

The printed material reflects the light from the light source so colors look different depending on the environmental light (ambient light).

Even with a clear image of the desired color, a change in environment can result in the following:



## Controlling environmental light

**Solution!**

- (1) Fluorescent light with a high color rendering index and appropriate color temperature.
- (2) Block outside light and view solely under fluorescent lighting as much as possible.

Under proper lighting, color evaluation can be performed with confidence

### High Color Rendering Fluorescent Lights\*

Toshiba Lighting & Technology

Type	Size	Name	Color Temp.	Ra
High Color Rendering Fluorescent Lamp	20"	FL20SN-EDL	5000 K	99
	40"	FL40SN-EDL		
	40"	FLR40SN-EDL/M		
	40"	FLR40SN-EDL/M/NU		

Panasonic

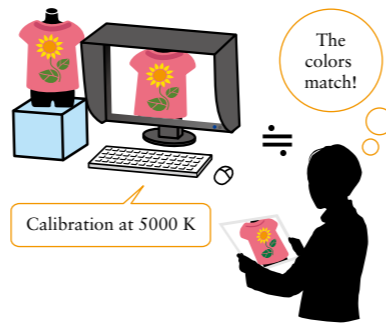
Type	Size	Name	Color Temp.	Ra
High Color Rendering Fluorescent Lights	20"	FL20SN-EDL	5000 K	99
	40"	FL40SN-EDL		
	40"	FLR40SN-EDL/M		
	40"	FLR40SN-EDL/M/NU		

\*Availability outside of Japan may vary.

In the printing digital workflow, confirm your prints using fluorescent light with the following specs:

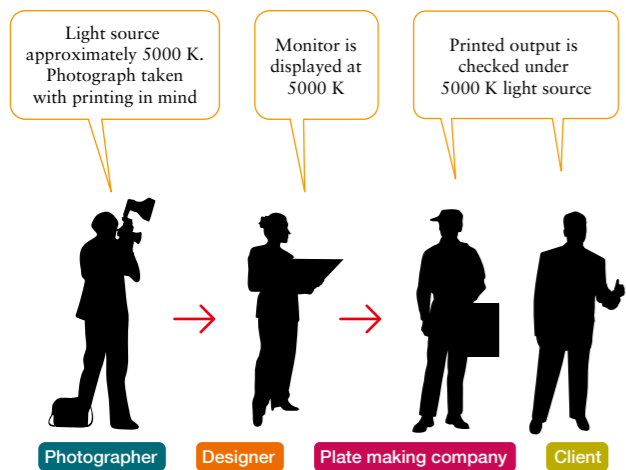
**Color Temp: 5000 K** **CRI (RA): 99**

Example) 5000 K/Ra.99



## High quality comes from sharing the same image!

The image profile and evaluation environment of the printed output are the staples that provide a common output image across different steps in the digital workflow.



Correct color under 5000 K light source



Printed material

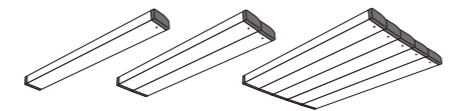
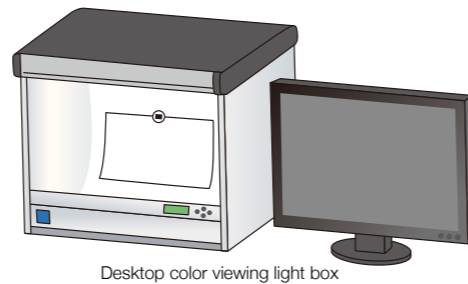


Final check under 5000 K light source. Start printing

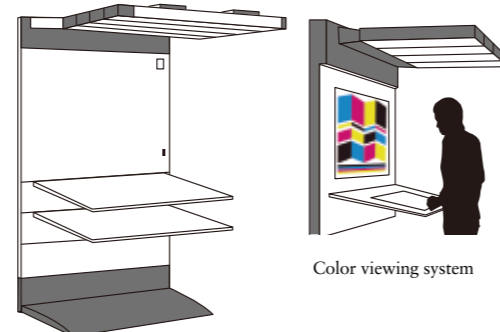
Printing company

## Use of color evaluation systems can be very effective!

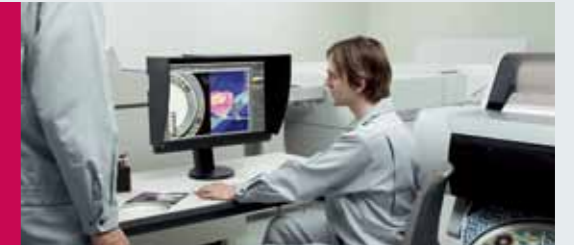
Installing a dedicated color evaluation system will make it possible to perform color checks of printed material in a more optimal environment.



Hanging fluorescent light module for color proofing designed to reduce unevenness in color and illumination



# Printer

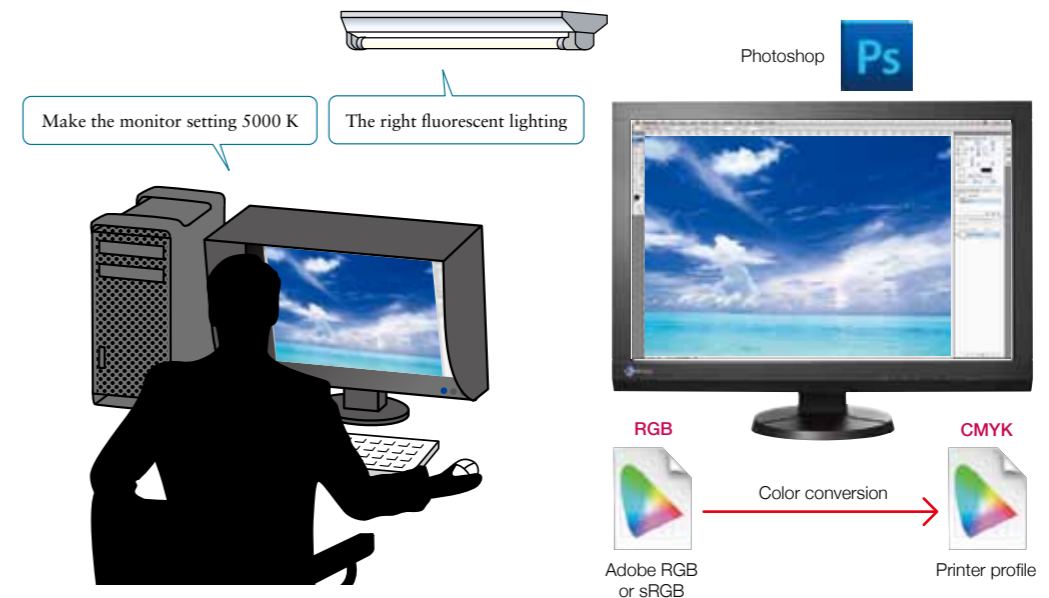


## Plate making

### Convert images to CMYK while looking at the monitor

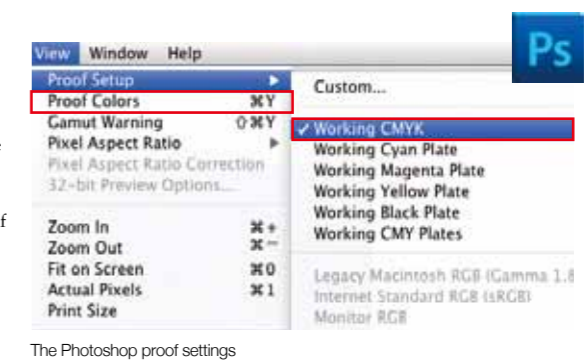
In today's digital printing workflow, it is the norm to submit RGB data. Dedicated conversion software is sometimes used to convert RGB to CMYK, but it's more common to do the conversion in Photoshop. Generally speaking, the profile embedded in the image data in commercial printing is Adobe

RGB, however sRGB data is sometimes submitted. Whichever kind of data it is, as long as you have color conversion software that supports color management, such as Photoshop, and a monitor calibrated to D50 (5000 K), you can do your work with a fairly good idea of how the final print will look.



### Printed color simulation using Photoshop's "Proof Colors" command

Converting RGB data to CMYK means revising the image from the wide RGB color gamut to the narrower CMYK one. The image quality deteriorates if this is done repeatedly. Rather than first converting the image to CMYK to perform retouching during the plate making process, you can get better results if you finish the retouching while it is still in RGB form and then convert it to CMYK and make any minute adjustments required. If you select "Working CMYK" in the Photoshop "Proof Setup", and use "Proof Colors" to switch between them as you work, you can run simulations of the print colors while still in RGB, which makes for more efficient retouching.



# Color proof

## Output a color proof via DDCP or an inkjet printer

Before sending material to be printed, you should check the color proof. Even in an environment appropriately prepared for color management and color properly checked on the monitor, the texture and whiteness of the printer paper, and the reproducibility of the ink used can cause different results. Thus, it is necessary to output a color proof on paper. Here we introduce various kinds of color proofs and their characteristics.

### Color proof trends

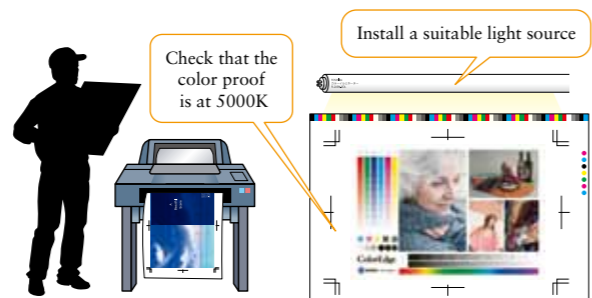
A flat-bed proof, press proof, DDCP (Direct Digital Color Proofing), or inkjet can be used for printing color proofs to match purpose, cost, and speed. Recently, high-end DDCP is capable of reproducing each dot and is the most popular while inkjet is lower cost by comparison. The main types of proofs are detailed in the chart below.

#### Characteristics of DDCP

	DDCP	
	High-end DDCP	Inkjet
Dot reproducibility	Same as the printer	Differs from the printer
Paper	Dedicated paper type (fewer types)	Dedicated paper type (including newspaper coating)
Color space	Slightly narrower than general offset printing	Wider than general offset printing
Spot color	None	PANTONE, DIC Color Guide, etc. (Difficulty with metallic and fluorescent colors)
Color stability over time	Good reproducibility Good matching with printer when printing in standard 4-color.	Good reproducibility Good matching with printer when printing in standard 4-color.
Cost	Cost increases with mass production	Lower cost (Takes more time for mass production)

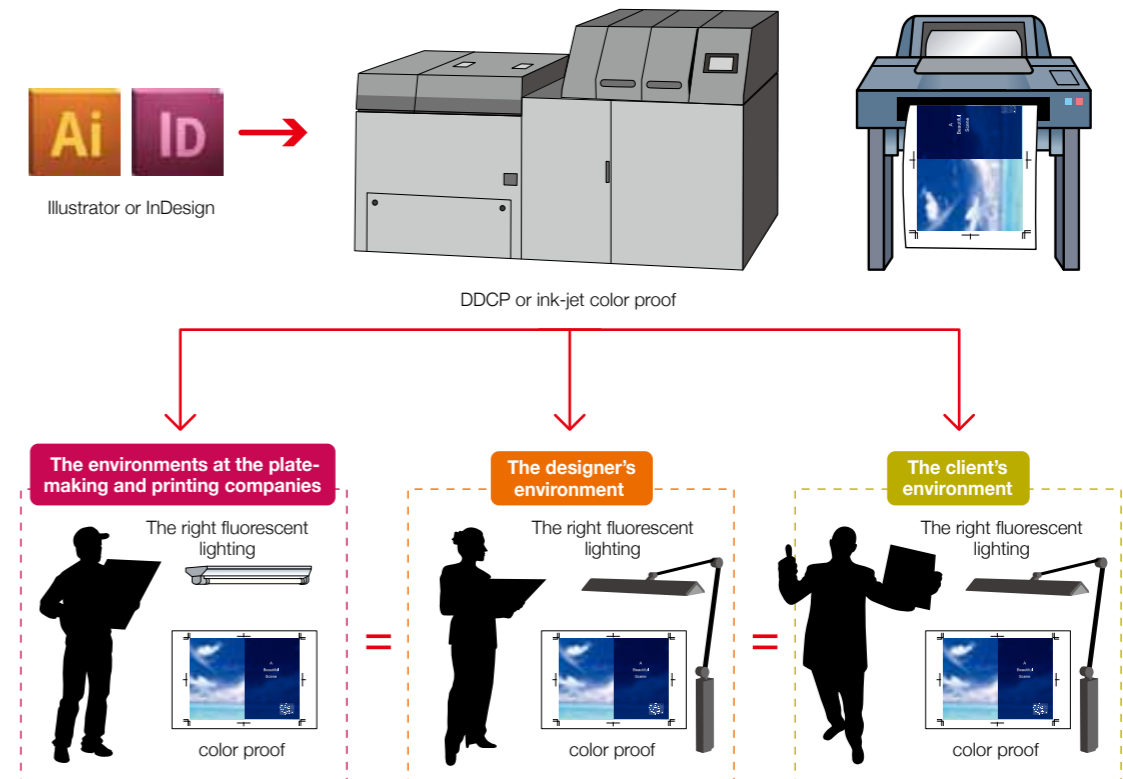
#### What is DDCP?

DDCP printing includes hardware such as laser, thermal, and inkjet. Traditionally in terms of color proofs, DDCP refers to a system required to satisfy the need for high precision output. However, recently it has come to also refer to digital output. Depending on the type, DDCP can be affected by ambient lighting. In order to accurately evaluate a color proof, it is important to maintain a properly lit environment.



## Lighting in the designer's and client's environment is important

The environmental light of the designer and the client is very important when checking printed color proofs. As was explained in pages 19-20, the colors will look the same when the environmental lighting in their respective locations is controlled. The efficient creation of high-quality printed materials is possible when communication about color goes smoothly.



## Color proofs: from flat-bed proof presses to DDCP, and now ink-jet is mainstream

The need for inkjet output of color proofs is gradually increasing, but paper type is limited and they cannot reproduce moire patterns. When compared to printed color proofs, there are still limitations to its reproducibility. Soft proofing, where proofs are done on a display monitor, may be a way to resolve these technical challenges.



A large Epson printer equipped with many colored inks

# Summary



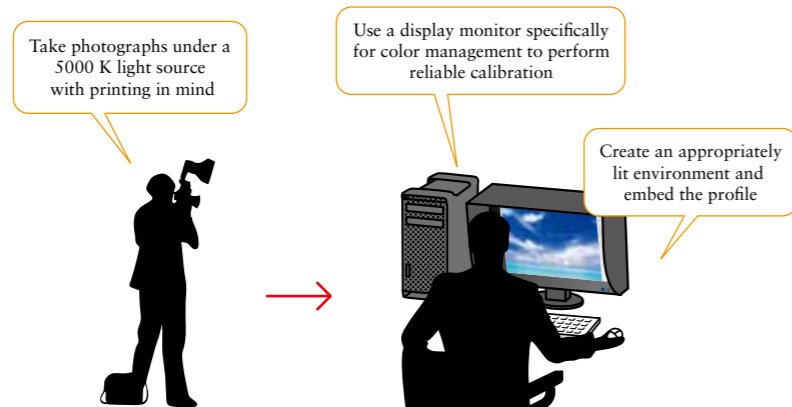
## Color Management Setup

### The perfect monitor for every workflow

So far we have followed each workflow to a finished final product by covering correct use of data and putting color management into practice. Here we will introduce the best monitors for using color management in the workflow.

#### Review

Photographer Retoucher



#### Recommended Monitors

Professional Level  
ColorEdge CG Series

Built-in calibration sensor  
ColorNavigator calibration software  
and monitor hood included



27" CG277 24" CG247

**For Professionals Who Need the Best in Color Accuracy**  
A high-performance calibration sensor is built in so you can calibrate to 5000 K without an external sensor. A monitor hood is also included to shield the screen from the studio's ambient light for more accurate color.

Standard Level  
ColorEdge CX Series

Built-in correction sensor  
ColorNavigator calibration software  
included, hood optional



27" CX271 24" CX241

**Maintain Settings with the Built-In Correction Sensor**  
The CX series has display capabilities on a par with the CG series and has a wide color gamut that reproduces most of Adobe RGB. With an external sensor, you can calibrate using ColorNavigator software and maintain your settings with the built-in correction sensor for an accurate color display environment.

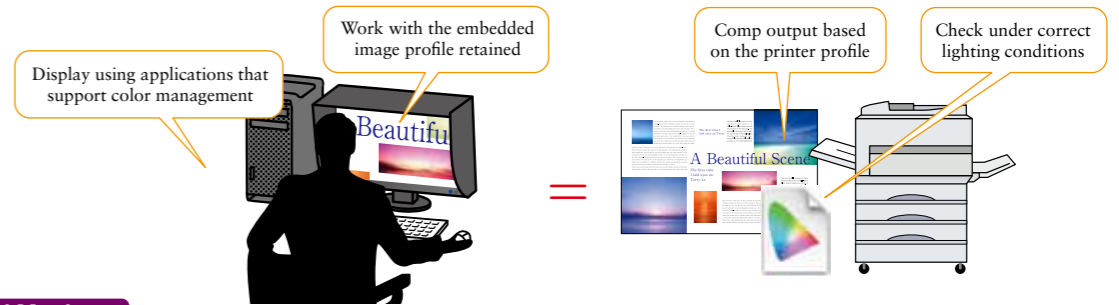
#### Highly recommended!

**1 The power to reproduce nearly all Adobe RGB**  
Produces intended colors and texture detail in a rich, smooth display. Increases the quality of materials with the ability to retouch work further.

**2 Stabilized display in only 7 minutes\* from startup.**  
The time it takes for the monitor to stabilize from the moment it is connected to the power is 4 minutes less than other monitors. Increases work efficiency in studios where movement is frequent allowing for quick continuation of image work.

\*Varies depending on measurement conditions.

#### Designer



#### Recommended Monitors

Standard Level  
ColorEdge CX Series

Entry Level  
ColorEdge CS240



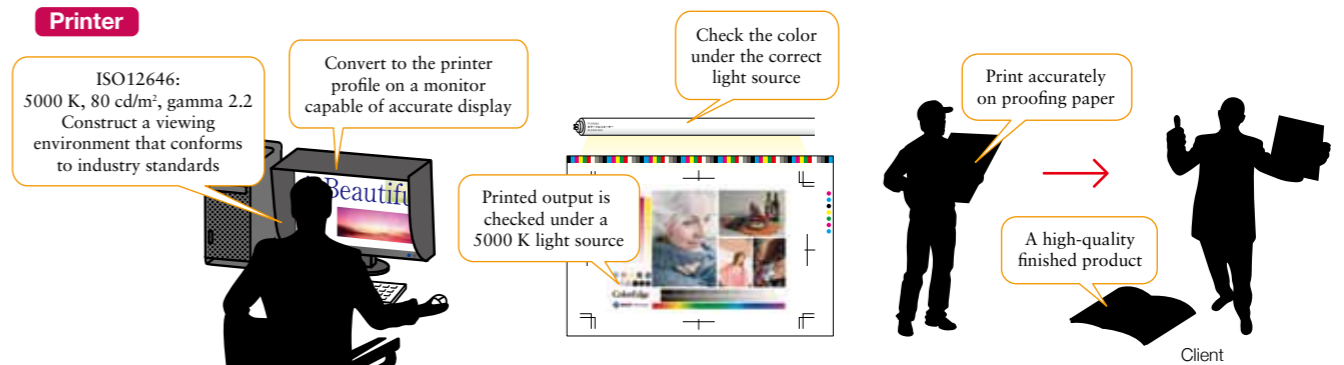
27" CX271 24" CX241 24" CS240

**Wide Color Gamut**  
The CX series and CS240 have a wide color gamut that reproduces most of Adobe RGB as well as common print color standards such as U.S. Web Coated. With an external sensor, you can calibrate using ColorNavigator software. The CX series lets you maintain your settings with the built-in correction sensor for an accurate color display environment.

#### Highly recommended!

- Automatic color management at regular intervals**  
The internal correction sensor of the CX series saves your calibration settings and will automatically readjust your display over time with no additional effort.
- Save multiple adjustment values with ColorNavigator**  
List and create several project goals such as printed materials, web contents, and comp output. With one button you can easily create materials on a suitable monitor and carry out smooth color communications.
- Design freely in a wide workspace**  
The 24.1" CX241 and CX240 can display a full A4 size screen and a color palette making DTP work simple. A flexible stand can be adjusted to suit your needs making long work hours easy.

#### Printer



#### Recommended Monitors

Professional Level  
ColorEdge CG Series

Built-in calibration sensor  
ColorNavigator calibration software  
and monitor hood included



27" CG277 24" CG247

**More Efficient Calibration**  
The built-in calibration sensor of each CG series monitor is individually adjusted at the factory to ensure no deviance. Compared to conventional monitors, this reduces the time required for maintenance while meeting the need for strict color control.

Standard Level  
ColorEdge CX Series

Built-in correction sensor  
ColorNavigator calibration software  
included, hood optional



27" CX271 24" CX241

**Maintain Settings with the Built-In Correction Sensor**  
The CX series has display capabilities on a par with the CG series and has a wide color gamut that reproduces most of Adobe RGB. With an external sensor, you can calibrate using ColorNavigator software and maintain your settings with the built-in correction sensor for an accurate color display environment.

#### Highly recommended!

- Complete matching between prints and a correct color display**  
Able to reproduce a wide color gamut according to printing industry standards. Each function supports color reproduction to create a display that accurately matches the image.
- Stable, uniform display**  
A circuit corrects unevenness in the screen as well as brightness, chromacity, and gradation to maintain a high quality display, supporting the delicate nature of image work.
- Automatic color adjustment at regular intervals**  
The internal sensor will automatically readjust the monitor's colors to the correct values even when it is not being used, increasing work efficiency.

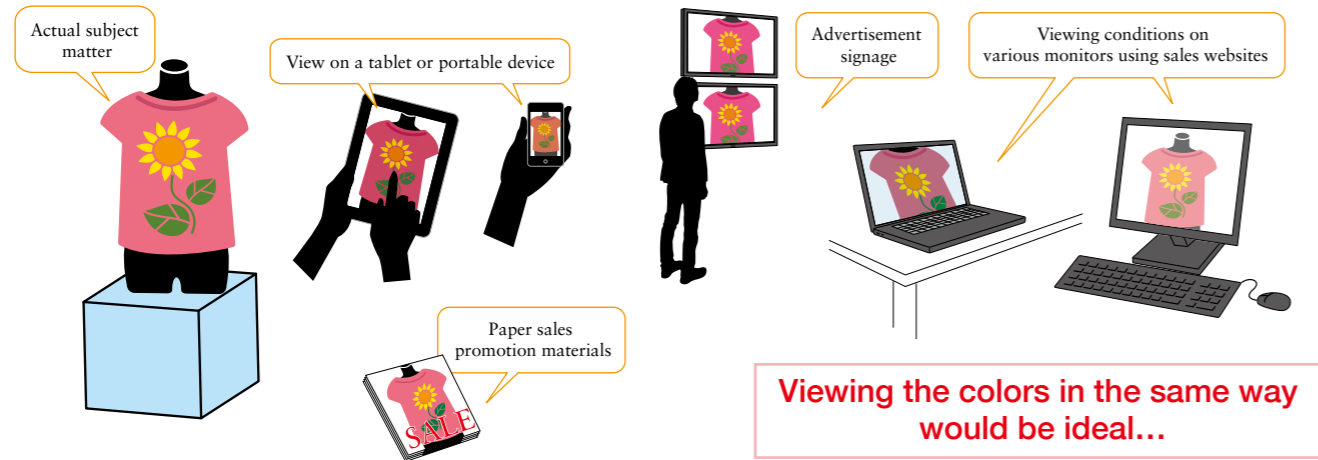


## Creating digital content

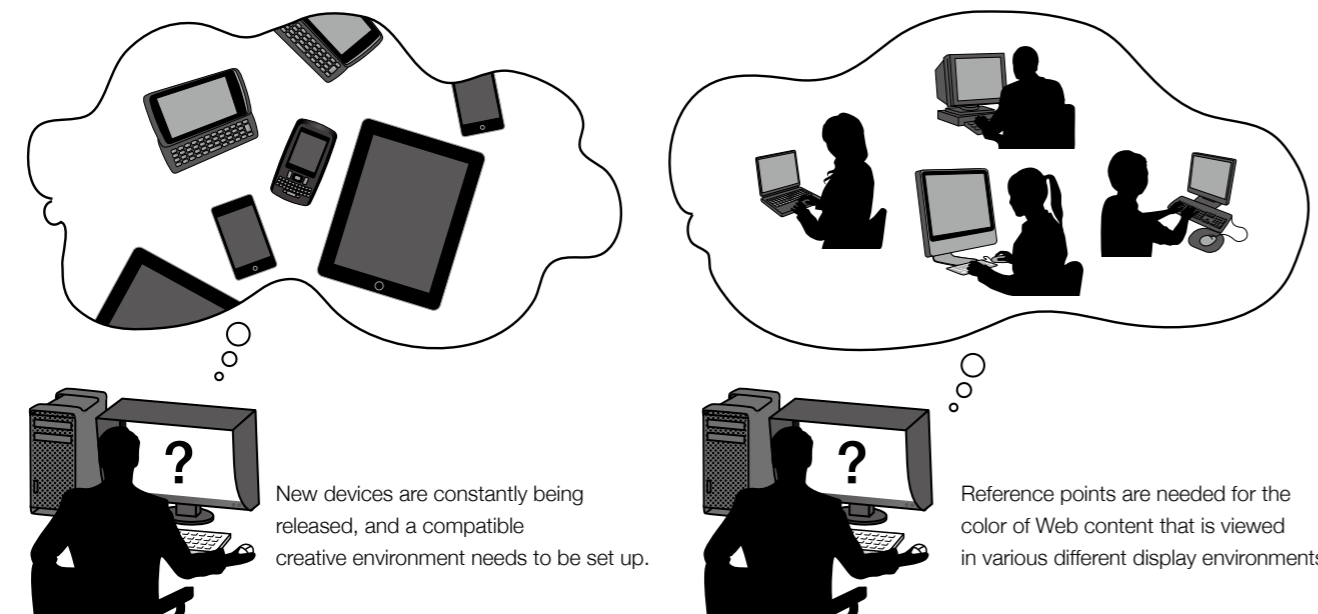
### Define the color space underpinning the work process

As IT has become more widespread and sophisticated in recent years, printers and designers who used to create content mainly aimed at printed materials are now having more and more opportunities to become involved in the creation of digital content.

Product advertising that uses digital media and e-commerce is expanding in scale and becoming more important with every passing year, and color reproduction in digital content is now a problem that cannot be ignored.



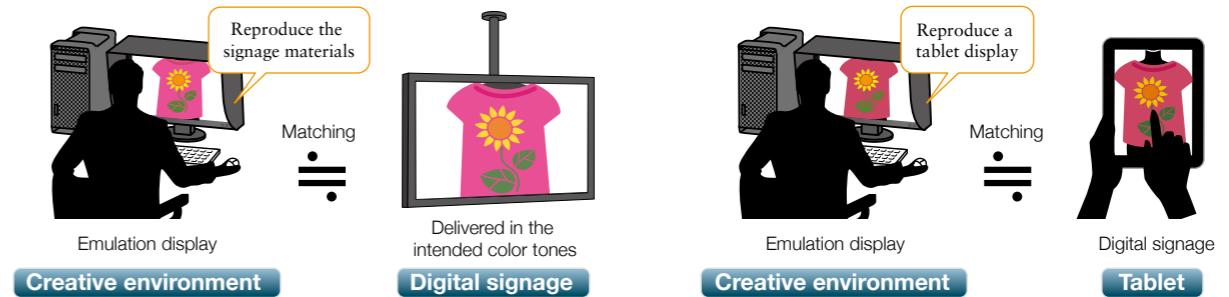
### Workplace issues in the creation of digital content



### Color matching for digital devices

Most of the end-use display devices, such as tablets and digital signage, do not have a color space or profile that can act as a reference when creating content. Nor are they installed with a color management function that would use such benchmarks.

It is therefore necessary to do the creative work on a monitor which can reproduce the tones of the display device in order to produce a design with the intended final color tones.



#### Device emulation

Using ColorNavigator, the dedicated calibration software, ColorEdge monitors provide an emulation function for the color tones of devices such as tablet computers. Emulation is performed by reading color patches displayed in the web browser of the emulated device, and creating an ICC profile which is adopted for the ColorEdge's internal parameters. This function can be used with a variety of devices such as smartphones, portable game terminals, and CRT monitors as well as tablets.



ColorNavigator 6.1 or above comes with a function to create an ICC profile for external devices

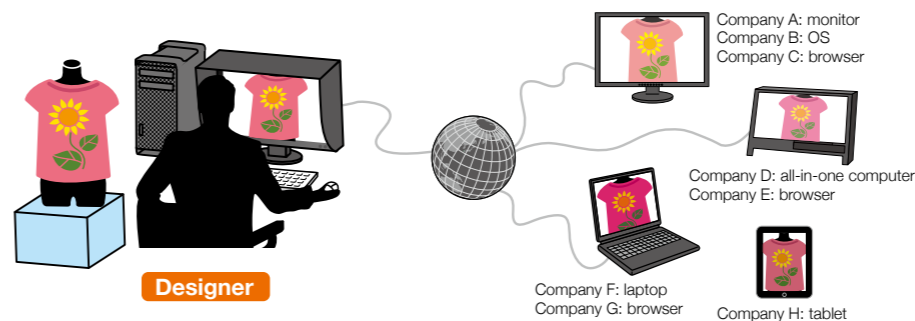
Measuring the status of a device's display and creating a profile

ColorNavigator automatic measurement technology used to display on Web browsers is EIZO patented technology.

### Color management of web content

There is an increasing need to create web content with accurate color display, particularly for e-commerce sites. However, the color tones on the devices displaying the web content depend on the web

display environment of each user. It is thus effectively impossible to have all users view the content in the correct color tones.



When creating web content it is necessary to conform to the highly versatile sRGB, designated as the web standard by the World Wide Web Consortium (W3C) and to think about how to enable as many people as possible to see the intended colors.

#### Compatibility with web browser color management

There is great diversity in the color tones of the devices that display web content so recently more and more browsers are equipped with a color management function. Browsers such as Safari, the Mac standard, and Firefox in the Windows environment are compatible with color management functions, so it is desirable that images for use in web content be embedded with a profile. On the other hand, there are still many environments, such as the long-established Internet Explorer, that are incompatible with color management functions so it is probably safer to create images using the sRGB color gamut.

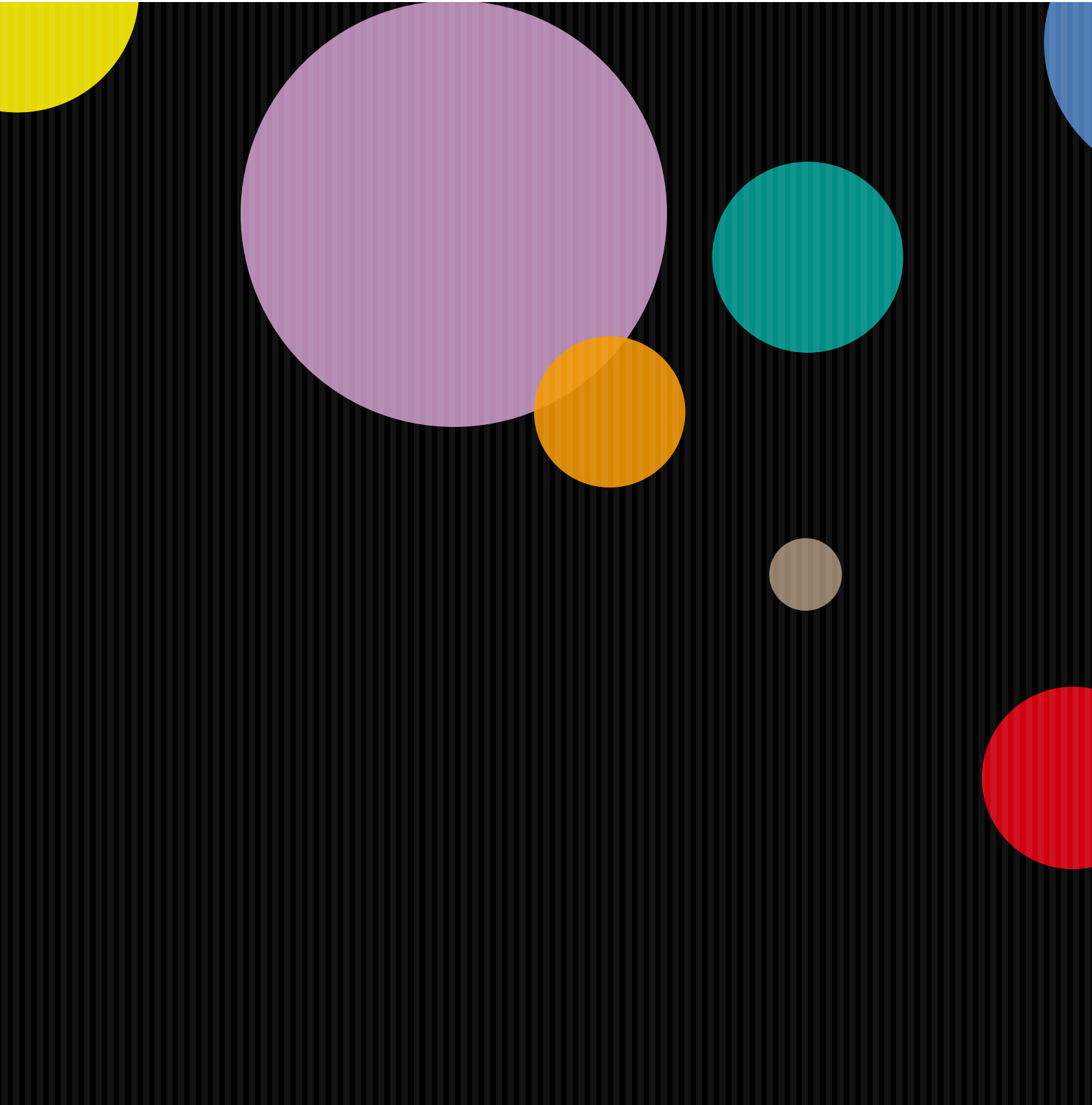
Embed a profile for users of OS or browsers that are compatible with color management



Check the images with the sRGB gamut, which closely resembles those of many devices

Adjust the monitor used for creative work to versatile sRGB with its large population of users

Deliver in the right colors to as many people as possible



**EIZO Corporation**

153 Shimokashiwano, Hakusan, Ishikawa 924-8566 Japan  
Phone +81-76-277-6792 Fax +81-76-277-6793  
[www.eizo.com](http://www.eizo.com)

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