



Full Color Gamut and Authentic Colors
only able to be captured by the "2D Colorimeter"



Provide the customizing system based on customer's needs and purpose



Even identifies flip-flop color differences. Ideal for paint color management for vehicles.

■ PPLB-100

[Basic specifications]

- Image input device: 2D Colorimeter [RC-500]
- System configuration: RC-500, PC for control and measurement, cables, camera crane, high color rendering fluorescent lamp
- Main unit size: W1,000 × D1,500 × (H1,800 to 3,200) mm
- Weight: Approx. 40 to 50 kg

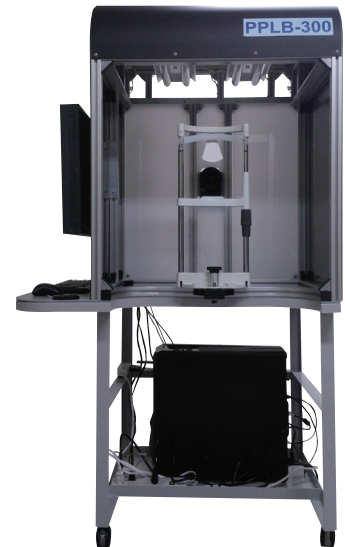


An upright type with high versatility on which color shift and irregularity are obvious.

■ PPLB-200

[Basic specifications]

- Image input device: 2D Colorimeter [RC-500]
- System configuration: RC-500, PC for control and measurement, wide color gamut monitor, cables, high color rendering fluorescent lamp
- Main unit size: W1,200 × D730 × H2,147.5 mm
- Weight: Approx. 50 to 60 kg



Records skin color and radiance exactly the way it is seen. Customized for color analysis of the human face.

■ PPLB-300

[Basic specifications]

- Image input device: 2D Colorimeter [RC-500]
- System configuration: RC-500, PC for control and measurement, wide color gamut monitor, cables, high color rendering fluorescent lamp
- Main unit size: W700 × D800 × H1,700 mm
- Weight: Approx. 40 to 50 kg

the 2D Colorimeter lineup

A core unit with the same sensitivity as the human eye

2D Colorimeter RC-500 for still images

[Basic specifications]

- Effective number of pixels: Approx. 5 million, • Effective area: 9.93 × 8.7 mm, • Image size: 3.45 μm × 3.45 μm
- Video output: 12 bit, • Interface: GigE, • Shutter speed: 1/1,000 to 1/15 sec, • Image loading time: Within 2 seconds,
- S/N ratio: 60 dB, • Lens mount: F mount, • Main unit size: W100 × D130 × H100 mm, • Weight: Approx. 1.5 kg



2D Colorimeter RC-300 for videos

[Basic specifications]

- Effective number of pixels: Approx. 2 million/3 million, • Effective area: 5.12 × 3.84 mm, • Image size: 2.5 μm × 2.45 μm,
- Video output: 10 bit, • Interface: Camera Link, • Shutter speed: 1/1,000 to 1/15 sec, • Cumulative time: 30 frames,
- S/N ratio: 56 dB, • Lens mount: C mount, • Main unit size: W68 × D90 × H68 mm, • Weight: Approx. 0.5 kg



*Lenses are not included in the main units of both RC-500 and RC-300 *The color difference between RC-500, RC-300 and a spectrophotometer is $\Delta E \leq 1.0$

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Capturing color gamuts of the human eye unable to be reproduced on an RGB camera

What's the "2D Colorimeter"?

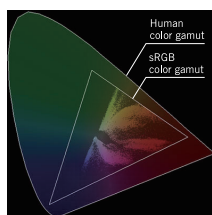
Faithfully reproducing and measuring color as seen by humans

The "2D Colorimeter" made by PaPaLaB is a revolutionary metric camera capable of faithfully measuring all colors visible to the human eye. By adopting the special filter developed in joint research by PaPaLaB and Professor Shimohira of Shizuoka University, we have achieved two-dimensional (face) color measurement as opposed to the conventional one-dimensional (point) color measurement. With 2D color measurement, comparisons can be made of not only colors, but also textures and patterns. Color information on par with a spectrophotometer can be obtained.

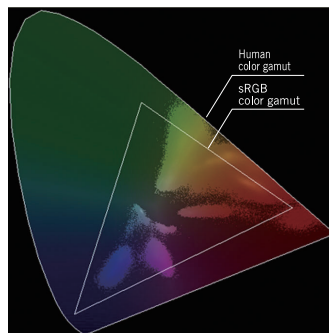


Captured image

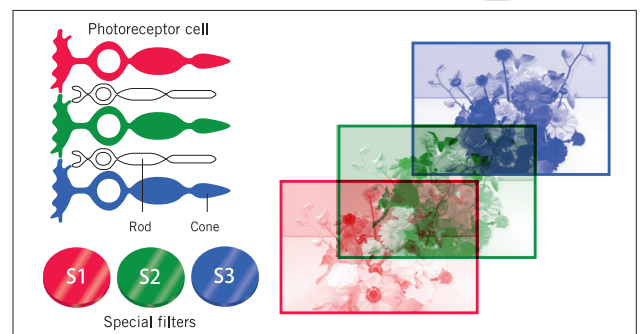
A comparison of the color histogram distributions obtained from identical image data clearly demonstrates that the 2D Colorimeter is capable of obtaining color of a higher accuracy across a wider range compared with the color histogram distribution obtained from a single-lens reflex digital camera.



Single-lens reflex RGB digital camera



2D Colorimeter



By overlapping 3 images captured by the S1, S2 and S3 filters, which are equivalent to a photoreceptor cell (cone cell), a color gamut as seen by humans is reproduced.

Differences between visual inspections, spectrophotometers and cameras

“Authentic color” has true value

Variation in visual inspections is unavoidable due to the physical condition of the inspector and the fact that the person in charge of inspections changes. Spectrophotometers observe color differences under a standard light source, therefore colors will appear different under common fluorescent light. RGB cameras cannot be used for color measurement as their color gamut is narrow and the colors are inaccurate. PaPaLaB's 2D Colorimeter is not only able to accurately quantify color data, but also enables actual colors to be viewed accurately from captured images.

The 3 advantages of 2D Colorimeters

1 Overwhelmingly fast

As the 2D Colorimeter is a camera, it is capable of measuring still images in less than a second and videos in real-time. Because the measurement flow cycle can be performed at high speed, work efficiency of in-line inspections, etc. is dramatically increased.

2 Able to compare even complicated, subtle patterns and textures

With a wide measurement range, the 2D Colorimeter does not average out colors, and is therefore capable of comparing textures (metallic characteristic, shine, etc.).

3 Not reliant on experience and intuition. Quantifying as data

The color data captured by the 2D Colorimeter can be saved, and this is useful as a database for the accumulation of color data, traceability of inspections and so on. This data can be opened anytime, anywhere, and sent to a remote location via the Internet.

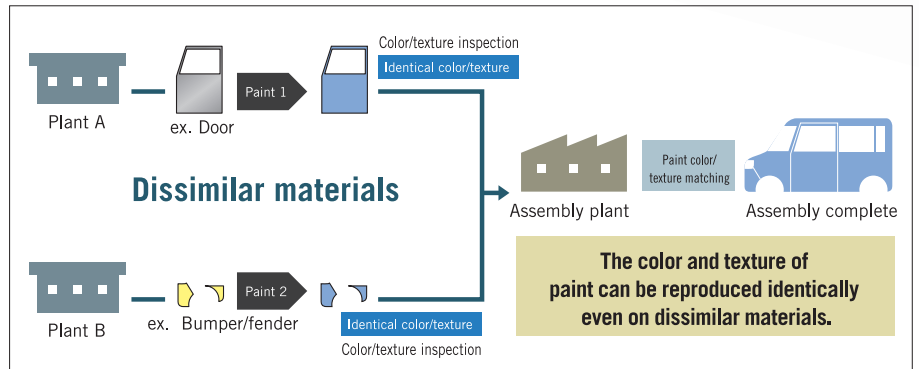
Solution case 1

 Automotive area

For color matching of paint on parts of dissimilar materials

In recent years, the popularization of eco cars has led to more dissimilar materials being used in both the exterior and interior parts of vehicles in order to reduce weight by combining a number of light, robust materials. Moreover, metallic and pearl colors are becoming common in order to give vehicles a more sophisticated texture. With 2D

Colorimeter, even metallic colors and colors with a degree of transparency can be faithfully inputted as seen by the human eye and quantified as color data. Even without a craftsman's know-how and experience, anyone can perform fine color matching easily based on color data, achieving an even color of paint. 2D Colorimeters are already adopted on the in-line painting inspections of large manufacturers and are held in high regard.



A new technique for vehicle body painting. Measurement using a 2D Colorimeter enables the colors and textures of dissimilar materials to be matched prior to assembly.



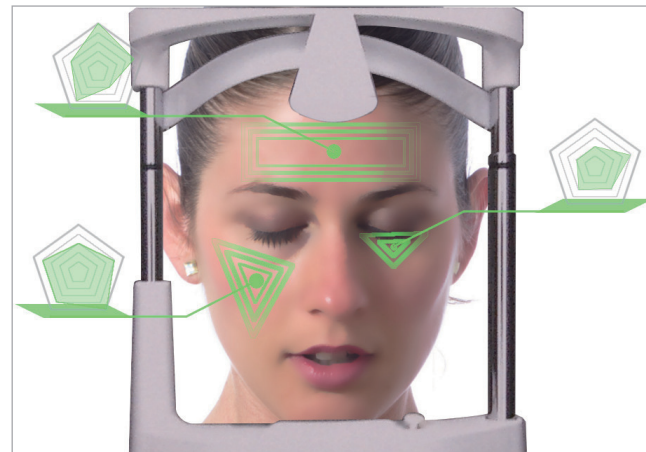
Instantly solving the color matching concerns of various industries and business areas.

Solution case 2

 Cosmetics area

Doesn't overlook subtle changes of the skin

Conventional cameras were poor at accurately capturing the color of human skin. Therefore, it was not possible to verify and evaluate the results of monitoring after several weeks of basic skin care. With the 2D Colorimeter, not only can the color of the skin be captured, but it is also possible to accurately capture subtle changes in the skin after using skin care, such as the elasticity, texture and amount of oil. This information can then be analyzed as image data. This means it is possible to quantify visual inspections which relied on the experience and intuition of inspectors. This technology can also be applied to inspections for foundation irregularity and wigs/hair coloring.



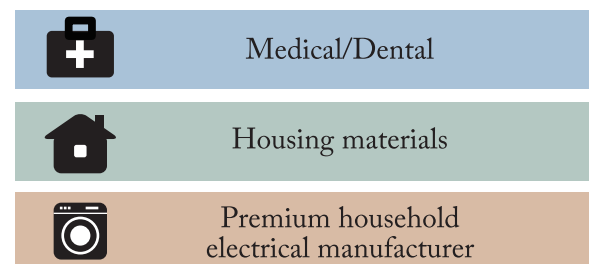
By using the face capturing and analyzing device, PPLB-300, an image of the face before and after applying makeup can be acquired and the shape and size of the image area to be inspected can be selected arbitrarily.

Solution case 3

 Package printing area

Inspects color shift of packages from different production lots

The 2D Colorimeter is also extremely effective in regards to product package printing. Able to match patterns without color patches, it is possible to prevent color shift of packages from different production lots when they are lined up on display in a store.



Any variation in color due to differences in materials and textures is also eliminated.