Proposal for High Color Rendering, Natural-light LED Light Units

Characteristics of CCS's High Color Rendering, Natural-light LEDs

CCS's original High Color Rendering, Natural-light LEDs can precisely reproduce the true colors of the objects with natural lighting close to the sunlight.
At Ra98, we have achieved one of the world's highest general color rendering indexes.
CCS's High Color Rendering, Natural-light LED Light Units are widely used as optimum lighting for the inspection place that demand accurate reproduction of the color.

Application Examples

- Hue Discrimination Inspection
- Color Evaluation Inspection
- Color Discrimination Inspection
- Color Measuring Inspection
- Sensor Calibration Inspection

And Much More

NatuLED

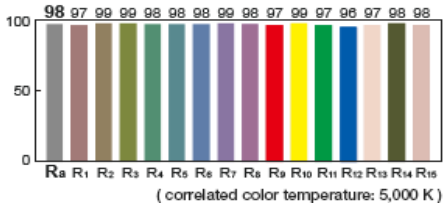
*A color rendering index is used to evaluate the ability to render each of 15 colors against a standard value of 100.
*The general color rendering index, Ra, is the average of the values for R1 to R8.
*The pictures shown above are conceptual images.

What Is High Color Rendering, Natural-light LED Lighting?

One of the Highest Color Rendering Indexes in the World at Ra98*1

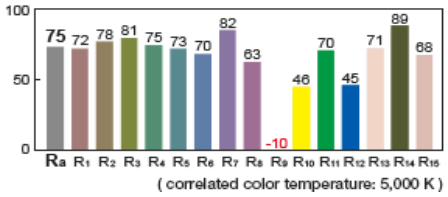
CCS's High Color Rendering, Natural-light LED Light Units use LEDs that were specially developed by CCS to reproduce natural-light colors close to those of sunlight. At Ra98, we have achieved one of the world's highest general color rendering index (CRI), which tells how close a light is to sunlight. Also, even when the light color is changed, CCS's technology makes it possible to keep Ra95 or above. In addition to the high general CRI, CCS has also achieved high special CRI, such as those for primary colors and flesh tones. Specifically for red (R9), yellow (R10), and blue (R12), you can see colors rendered to a level that was not possible for previous light sources.*2

High Color Rendering, Natural-light LEDs



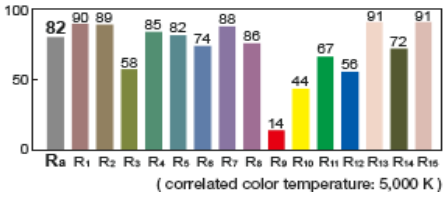
(correlated color temperature: 5,000 K)

Normal White LEDs



(correlated color temperature: 5,000 K)

Three-wavelength Daytime Fluorescent Lights

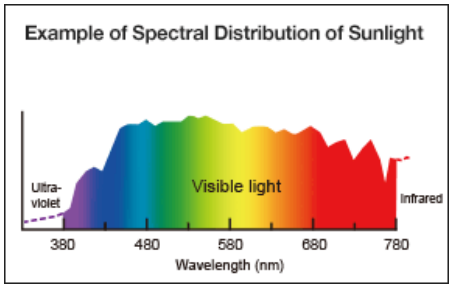


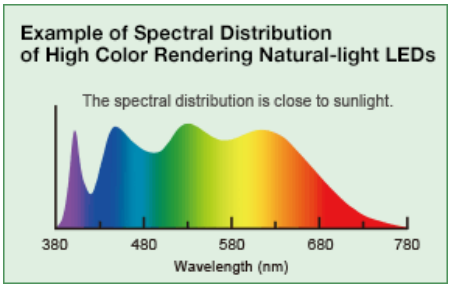
(correlated color temperature: 5,000 K)

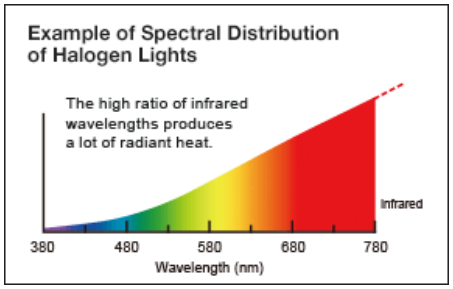
*1) According to CCS investigation in July 2017.
*2) A color rendering index is used to evaluate the ability to render each of 15 colors against a standard value of 100. The general color rendering index, Ra, is the average of the values for R1 to R8. The special color rendering indexes, Ri, are the results of individual evaluations of colors R1 to R15 (with priority given to evaluation of R9 to R15). (Measurements were made according to JIS Z 8726, Method of Specifying Colour Rendering. Properties of Light Sources.)

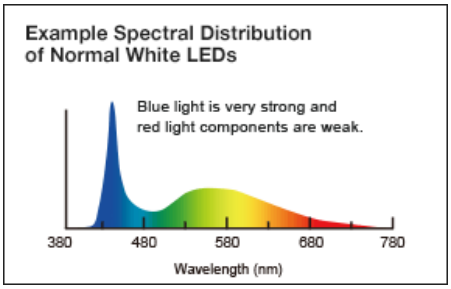
Spectral Distribution Characteristics Close to Sunlight

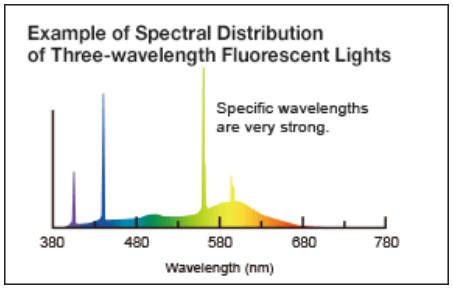
High color rendering, natural-light LEDs produce a smooth continuous spectral distribution across all wavelengths, just like the spectral distribution of sunlight. While normal white LEDs and fluorescent lights have some wavelength regions that are very strong or even missing, CCS's high color rendering LEDs cover almost the entire range of visible light.











■ Color Rendering

Color rendering expresses the affect of a light source such as a light on the appearance of the colors of an object. The color rendering properties express the properties of the appearance of the object.

Normally, a light source with good light rendering properties can illuminate an object without changing the colors of the object.

In Japan, the JIS standards define a color rendering index (Ra) with a maximum value of 100 to numerically express how objects appear.

The higher the value is, the closer the colors of the object appear to the natural colors.

● Comparison of Color Rendering Properties

High Color Rendering, Natural-light LED Light

Conventional White LED

Tuning the Correlated Color Temperature, Spectral Distribution, and Color Rendering Index

With CCS's High Color Rendering, Natural-light LED Light Units, the correlated color temperature, spectral distribution, and color rendering index can be tuned to fit customer needs.

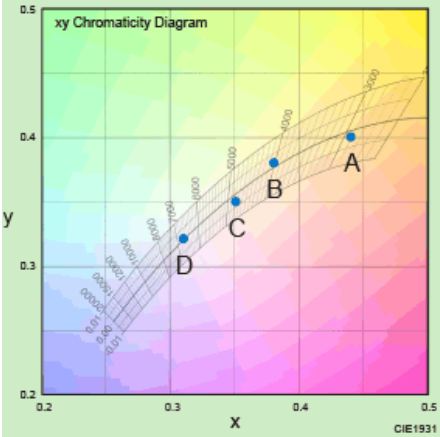
We can provide the ideal LED Light Units with our complete manufacturing system from LED development through final product manufacturing.

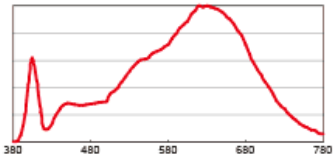
■ Tuning Examples

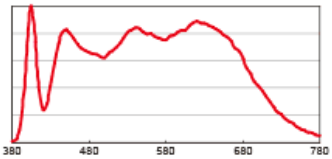
- Correlated color temperature illuminant A (2,856 K)
- Correlated color temperature illuminant D65 (6,504 K)
- Correlated color temperature of 5,500 K
- Correlated color temperature of 2,700 or 5,000 K
- Spectral distribution with lower green wavelength
- Light Units with less fluctuations in color

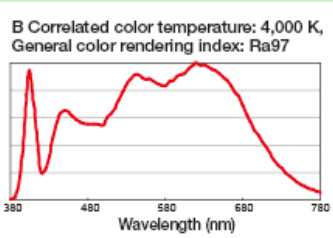
■ High Color Rendering, Natural-light LEDs Developed by CCS

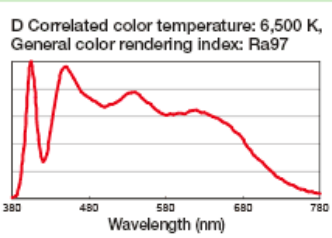
■ Examples of Tuning the Correlated Color Temperature, Spectral Distribution, and General Color Rendering Index











Light Units Manufactured in Many Different Shapes

Since being founded in 1993, CCS has become a leading manufacturer of LED lights for industrial inspections with a top market share both in Japan and around the world. CCS has designed, developed, and produced over 10,000 Custom Light Units to provide the ideal lighting for each customer's needs.
For details of the products, please contact our branches shown below.


Ring Light Units


Bar Light Units


Dome Light Units


Flat Light Units


Flat Light Units


Spotlights

We will manufacture Custom Light Units according to your needs.

■ Items That Can Be Changed for Custom Light Units

- Size
- Length and thickness
- Brightness
- Color temperature
- Illumination structure
- Installation position and mounting method
- Cable length
- Connector shape

* Please feel free to contact us for these or any other type of customization.