



Colour Rendering & Light Quality

LED lamps with higher colour rendering quality produce more natural colours.



CRI Test Color Patches R_1-R_8



Supplemental Test Color Patches R_9-R_{14}



CQS Color Samples



Note that R15, intended to simulate Asian skin tone, is not shown because it was a late addition to the system. Due to printing variations, these colors may not render accurately.

What is the colour rendering index?

The **Colour Rendering Index (CRI)** is a measure of the degree of colour shift objects undergo when illuminated by the light source as compared with the colour of those same objects when illuminated by a reference source, of comparable colour temperature.

Sometimes called the **Colour Rendition Index**, it's a quantitative measure of the ability of a light to reveal the colours of various objects faithfully, in comparison with an ideal or natural light source.

A reference source, such as blackbody radiation, is defined as having a CRI of 100. This is why incandescent lamps have that rating, as they are, in effect, almost blackbody radiators.



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The best possible faithfulness to a reference is specified by a CRI of one hundred. However a high CRI by itself does not imply a good rendition of colour, because the reference itself may have an imbalanced Spectral Power Distribution. For example, 2000K very warm white or 6000K very cool white are quite extreme colour temperatures.

The CRI cannot be calculated for light sources that are non-white light - the CRI is discontinuous at 5000K, because the chromaticity of the reference moves from the Planckian locus to the CIE daylight locus.

Warmer colour LED lights can achieve a CRI almost the same as sunlight, with some major manufacturers boasting up to 98 CRI. Average quality compact fluorescent lamps don't get even close at around 75 CRI.

With a lower CRI, you may feel that you've lost warmth, and objects, skin colour etc. may have a green hue.

Poorer colour rendering lamps (<80 CRI) typically portray objects as dull and lifeless, whereas those with higher CRI provide more natural colours.

Be wary of lights with a low CRI.

Good light quality



LED Lamps
CRI 80 or above

Bad light quality



Fluorescent Lamps
CRI 70 or below