



Lighting Design Knowledgebase

Lighting Design Glossary

Color Temperature Correlated Color Temperature (CCT) Kelvin

(Term of *photometry*)

Color temperature is a simplified way to characterize the spectral properties of a light source. While in reality the color of light is determined by how much each point on the spectral curve contributes to its output, the result can still be summarized on a linear scale.

This value is useful eg. for determining the correct film in photography depending on the lighting (resp. for determining the *white balance* in digital photography), and for specifying the right light source types in architectural lighting design. Note, however, that light sources of the same color (*metamers*) can vary widely in the quality of light emitted. One may have a continuous spectrum, while the other just emits light in a few narrow bands of the spectrum. A useful way to determine the quality of a light source is its *color rendering index*.

Low color temperature implies warmer (more yellow/red) light while high color temperature implies a colder (more blue) light. *Daylight* has a rather low color temperature near dawn, and a higher one during the day. Therefore it can be useful to install an electrical lighting system that can supply cooler light to supplement daylight when needed, and fill in with warmer light at night. This also correlates with human feelings towards the warm colors of light coming from candles or an open fireplace at night.

Standard unit for color temperature is **Kelvin (K)**.

(The kelvin unit is the basis of all temperature measurement, starting with 0 K (= -273.16°C) at the absolute zero temperature. The "size" of one kelvin is the same as that of one degree Celsius, and is defined as the fraction 1/273.16 of the thermodynamic temperature of the triple point of water, which positions 0°Celsius at 273.16 K.)

Technically, color temperature refers to the temperature to which one would have to heat a theoretical "black body" source to produce light of the same visual color.

Some typical color temperatures are:

- 1500 K Candlelight
- 2680 K 40 W incandescent lamp

3000 K	200 W incandescent lamp
3200 K	Sunrise/sunset
3400 K	Tungsten lamp
3400 K	1 hour from dusk/dawn
5000-4500 K	Xenon lamp/light arc
5500 K	Sunny daylight around noon
5500-5600 K	Electronic photo flash
6500-7500 K	Overcast sky
9000-12000 K	Blue sky

References:

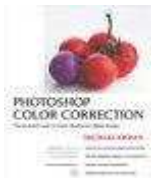
[color rendering index](#)
[daylight](#)
[metamer](#)
[photometry](#)
[white balance](#)

English

color temperature
 correlated color temperature
 CCT

German

[Die Farbtemperatur](#)

Recommended Reading:

[Photoshop Color Correction](#) (Paperback)

[Michael Kieran](#)

Peachpit Press, 30 August, 2002

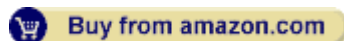
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