

FAST FACTS

Re: Color Temperature Explained

Introduction:

The advent and market penetration of LED light sources has introduced a new term with which many people are unfamiliar – Correlated Color Temperature (CCT, or sometimes simply “Color temperature”, which refers to the color of white light as it appears to the eye. This has many folks asking about color temperature and what it means, scratching their heads trying to understand the concepts. Questions like, “Why is a so-called warm white source a lower color temperature than a cool color source?” This seems to make no sense. We decided it would be worthwhile explaining color temperature in as close to layman’s terms as possible.

Color Temperature Basics:

All artificial lighting sources produce light in various wavelengths.

Imagine an Iron Bar (in lighting lingo, we call it a “black body radiator”). Put the bar in a furnace and heat it up. Measure the temperature of the bar in Kelvin degrees, not Fahrenheit or Celsius. As the bar heats up, it goes from a red to orange, to yellow, to blue. Most people know that blue flame is hotter than yellow flame, even though it looks “cooler” (think acetylene torch).

When the bar reaches 2700° Kelvin, it is glowing, and it looks like an incandescent light bulb (typical 60W like you’d have in a table lamp at home).

At 3000° K, it appears to look like a halogen light, or a warm white fluorescent light.

At 4000° K, it looks like a metal halide fixture (lights like you see in a gym or stadium, or warehouse type retail store.)

At 4100° K, it looks like a Cool White Fluorescent light (like what was common in offices and retail stores 10-20 years ago, and still somewhat today.)

At 5000° K, it is starting to look very crisp white, with a tiny hint of blue. Many industrial sites are using 5000K LEDs for the crisp white and added worker alertness they seem to enhance.

At 6500° K, it is what we call “daylight” in the lighting business.





As it continues on to higher temperatures, the bar glows more and more blue.

Most people associate the color blue with “cool”, or cold. Think about blue ice, or the deep, dark blue cold depths of the ocean. Reds, oranges and yellow are associated with warmth. This is why even though a light source described as “warm white” actually is a lower *color temperature* than a source described as “cool white”

Warm color
temperature

Cool color
temperature



The difference in CCT can have a tremendous impact on how a space looks and feels. For example, see the image of the stairwell. At first glance it appears the walls are painted two distinctly different colors. In fact, the wall is all the same color, but there are two different color temperature lamps at work. The difference is striking, and helps illustrate how important it is to select the appropriate color temperature for the space. If you have any questions about this or need assistance with a lighting project, please contact us at info@illuminfx.com.

