How to Choose the Right Color Temperature for Office or Classroom Lights

Light emission characteristics of a white light source are often expressed by a "color temperature" and is measured in K (Kelvin). If you have been exposed to indoor or studio photography you will know that a 5000K lamp will get you close to natural daylight.

Office and a classroom environment often have similarities as they are places where a lot of reading and evaluation of physical items are required. It has been proven that light sources nearer to daylight give higher contrast on printed matter and therefore make it easier to read longer with less fatigue.

Many organizations arbitrarily chose 4100K because a bright white fluorescent tube has about that color temperature, this has to do with the phosphors that convert UV light from the gas discharge tube into visible light and happens to be that 4100K producing phosphors are the lowest cost to produce for the fluorescent tube manufacturers, it also helps GE and others to create a specification that produces sort of dirty white light and is outside the real daylight spectrum.

Some lighting engineers go so far as to say that daylight is acceptable lighting but if a light can produce daylight it is not acceptable as it is more than 4100K - well a child could tell you that is plain wrong.

There is however a reason for standardizing on a color temperature and that is consistent look! If more than one fixture is in an area and there were different color temperatures in use it will look inconsistent both looking at the lights and on the illuminated target area.

Therefore it is more appropriate to apply the rule that if you are changing technologies you should do this for the whole area. Also mixing 4100K LED and 4100K fluorescent is not going to work well as the LED lights will remain at that color temperature for a long time while the fluorescents will change their color temperature significantly with use.

LED phosphors generally perform better at 5000K and today's 5000..5200K LED packages have very well balanced color spectrums making them appear almost like daylight, a good light for almost any task.

My best suggestions, based on optimum presentation or use for the application, are to the following color temperatures next to their respective applications:

Office, Warehouse, Classroom:	5000K..5200K
Board Room:	5000K..5200K
Conference Room:	5000K..5200K
Food Sections, Fish and Packaged Items:	2700... 3500K
Red Meat Food Sections:	2700K
5 Start Hotel	2700K..3500K
Coffee Shop:	3000K
Chinese Restaurant:	3000K
Restaurant with Ambiance:	2700K..3500K

Bakery:	3500K
Public Restrooms:	5000.5200K
Personal Bathrooms & Showers:	3500K
Retail Clothing:	3500K
Ball/Function Room:	3000K..3500K
Retail Tires:	5000K..5200K
Retail Shoes:	4000K..5200K
Cold Storage:	5000K..5200K
Manufacturing:	5000K..5200K
Gas Station Canopy:	4000K..5200K
Drive Through:	5000K..5200K
Indoor Swimming Pools:	5000K..5200K
Wooden Floors:	2700K..3500K
Orange and White Features:	5000K..5200K
Primary Color Objects (Red, Green, Blue, Orange)	5000K..5200K

Color temperature is one of preference and nothing that should be legislated.

There are some human factors to be considered as to how the eye perceives an illuminated object, we humans have an automatic white balance and if exposed long enough to a particular color temperature light a red-ish, blue-ish or green-ish white paper will look white to us. So rather than getting fixated that one color temperature is better than another make sure you do not mix them in the same area.

Of course, if you have a larger organisation more rigid guidance may be required. If you are retrofitting or building new office or classroom environments, you may want to consider making your new LED fixture requirement 5000K +/- 5% but specify close deviation tolerances +/- 2% within an area.

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