

Docket # 15-BSTD-01

2016 Building Standards Update

ALLOWING SUFFICIENT LIGHTING AND WATTAGE FOR THE NON-VISUAL OR BIOLOGIC PART OF THE VISUAL SYSTEM

August 8, 2015

Greetings

Maybe I missed it, and I am sorry if I did, but I have not seen anything about allowing more light and wattage for the nonvisual or biologic part of the visual system. It is my understanding that even if extra wattage is only used for the first 30 – 45 minutes of the morning at work or school, that wattage is included in LPD or comparison to existing wattage, just like the other lights, which are on all day long. What is the sense of saving every watt, if student performance or worker productivity goes down?

If you have not already seen this recent European report, please check it out, because it shows in several applications that increasing light levels and wattage can improve productivity, learning, wellbeing significantly, which dwarfs the higher electric bills. Europe is way ahead of the United States regarding this, and one reason is that most areas do not have energy codes, which just get in the way. Even without energy codes, Europe is usually quite efficient. For example, this report shows the benefits of 2000 lux (200 fc) in industrial applications. To achieve that light level, Title 24 probably does not allow that much wattage, which is a shame.

www.lightingeurope.org/uploads/files/Quantified_Benefits_of_Human_Centric_Lighting_April_2015.pdf

If you have a hard time opening it, save it as a pdf and then open the pdf.

The Human Centric Lighting Society or certain members on their own may be willing to help. You could compare the depth and breadth with anybody else.

<http://humancentriclighting.org/>

For example, a good number of people got concerned after reading this article.

<http://luxreview.com/article/2015/07/the-jury-s-still-out-on-human-centric-lighting-says-global-standards-body>

We went to the CIE sources and did not find any problem.

Basically the long used photopic lumen should be eliminated or at least its influence should be greatly reduced. A good example is this slide, which Dieter Lang from Osram in Germany presented at the Pacific Energy Center on May 21, 2014.

(Europe uses commas as we use periods for decimal points)

Melanopic Photometric Data



DIN Deutsches Institut für Normung e. V.

Examples for melanopic illumination levels at a given photopic illumination level of 1000 lx

melanopische photometric quantity:

$$X_{\text{mel}} = K_{\text{mel}} \cdot X_{\text{e, mel}}$$

(e.g. illuminance level, lumen output)

$$X_{\text{mel}} = \frac{K_{\text{mel}}}{K_{\text{m}}} \cdot a_{\text{mel v}} \cdot X_{\text{v}} = m_{\text{v mel}} \cdot X_{\text{v}}$$

illuminant	illumination level Φ photopic $V(\lambda)$	Melanopic daylight-equivalent illumination level $\Phi_{\text{mel D65}}$	ratio melanopic/photopic illumination levels $m_{\text{v mel D65}} = \Phi_{\text{mel D65}} / \Phi$	melanopic power(mW) / lumen (phot.)
standard illuminant A (CCT= 2856 K)	1000 lx	496 lx	0,496	0,657
illuminant F10, CIE (FL, CCT= 5000 K)	1000 lx	683 lx	0,683	0,906
illuminant F12, CIE (FL, CCT= 3000 K)	1000 lx	404 lx	0,404	0,535
standard illuminant D65 (daylight, 6500 K)	1000 lx	1000 lx	1,000	1,326
illuminant P (candle light)	1000 lx	267 lx	0,267	0,354
LED, white (CCT= 3035 K)	1000 lx	428 lx	0,428	0,567
LED, white (CCT= 5400 K)	1000 lx	787 lx	0,787	1,044
LED, white (CCT= 6535 K)	1000 lx	800 lx	0,800	1,062
fluorescent tube, white (CCT= 8000 K)	1000 lx	957 lx	0,957	1,269

Dieter Lang | OSRAM

If the CEC is short sighted and only wants to focus on energy saving, it will be a big picture loser.

There will be probably additional significant breakthroughs in lighting while the 2017 is in effect, and Title 24 should not block them.

You can email or call me at 10 AM or later Pacific time during daylight savings time, which is 7 AM or later here in Hawaii. Thanks for your consideration.

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