Email received on January 7, 2011 from Steve Hayes.

ENERGY STAR Luminaires Final Draft Comments

Upper and lower limits to colour temperature are included within the specification. No user benefit (or producer benefit) are claimed.
There is no reason to impose these limits, and there are compelling reasons not to do so.

Colour temperatures CCT are limited to 2700K minimum Human circadian rhythms are disturbed by light at night. This disturbance may have serious health effects, including cancer, diabetes, obesity in addition to sleep disruption (many many references exist for this, eg ref 1). This disturbance is nearly eliminated if the CCT is below 2000K (ref 2).
It should be permissible to offer a lamp with a CCT of about 1800K.

Colour temperatures CCT are limited to 4100K maximum (5000K commercial).
Since 2001 it has been known that human circadian rhythms are particularly sensitive to blue light with a peak at around 465nm (ref 3). Lamps specially made to take advantage of this are available now, Philips 17000K, Osram 8000K etc.
There is evidence (ref 4) that these successfully stimulate the human endocrine system to regulate or adjust the circadian rhythm, improving both alertness and sleep without requiring high light levels (ie without excessive energy consumption).
There should be no upper limit to CCT.

The "perfect" lamp would reproduce the light from the sun. In the daytime the CCT is much higher than 4000K, and in the evening much lower than 2700K. It would not be sensible to develop a standard which would "outlaw" sunlight.

Whilst products with these performance characteristics are not at presently widely available (with the notable exception of led lamps with a CCT of 6000/6500K which are common) the basic research is consistent in demonstrating the non-trivial health advantages of such lighting, and the EPA should not hinder the wide commercial distribution of such lamps for use in domestic and commercial applications.

ref 1 L. K. Fonken, J. L. Workman, J. C. Walton, Z. M. Weil, J. S. Morris, A. Haim, R. J. Nelson. Light at night increases body mass by shifting the time of food intake. Proceedings of the National Academy of Sciences, 2010; DOI: 10.1073/pnas.1008734107

ref 2 J.Phys.D:Appl.Phys. 43 (2010)234007(7pp)Modification of light sources for appropriate biological action
Kozakov R, Schopp H, Franke St, Kunz D doi:10.1088/0022-3727/43/23/234007

ref 3a Brainard, G.C., J.P. Hanifin, J.M. Greeson, B. Byrne, G. Glickman, E. Gerner, and M.D. Rollag. (2001) Action spectrum for melatonin regulation in humans: Evidence for a novel circadian photoreceptor. J. Neurosci. 21(16):6405-6412.
ref 3b Thapan, K., J. Arendt, and D.J. Skene. (2001) An action spectrum

for melatonin suppression: evidence for a novel non-rod, non-cone photoreceptor system in humans. J.Physiol. 535:261-267.

ref 4 Viola AU, James LM, Schlangen LJ, Dijk DJ (Aug 2008) Blue-enriched white light in the workplace improves self-reported alertness, performance and sleep quality., Scandinavian journal of work, environment & health, 34 (4), 297-306

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