

To whom it may concern,

As a brief introduction, I am an electrical engineer who has been involved in the development of electronic drivers for LED luminaires at 3M.

In an attempt to add to the discussion around developing performance criteria for LED luminaires, I have been requested to provide some comments on power factor performance. It is acknowledged that this input may be somewhat past due but I hope it is still timely enough to be added in the discussion.

The luminaire power factor is one component of the efficiency of the electrical power to lumen conversion. The present draft requirement of a power factor of greater than 0.7 for solid state lamps is in my humble opinion rather low. One way of looking at this requirement is that a luminaire that requires a line power delivery of $1/0.7$ (about 1.43) times what the luminaire dissipates would be acceptable. The power remainder of 30% would be reflected by the luminaire and ought to be considered a waste. I believe this substantially undermines the promise of energy savings that can be obtained by solid state lighting.

With the experience that the industry has gained, we know that with proper design it is not hard to obtain power factors substantially better than 0.7.

In fact, power factors that are routinely 0.99 or even better are easily obtainable.

The one international standard on power factor or harmonic performance (IEC 61000-3-2) has guided our work at 3M and the harmonic content table that is part of this IEC standard (class C electrical lighting) means that compliance is generally obtained if the power factor exceeds about 0.95.

Considering the above, I am requesting that the present power factor requirement of 0.7 for solid state lighting receives further scrutiny and that we consider raising this standard to 0.95 to harmonize this requirement with the mentioned IEC standard. It would enable us to truly deliver on the promise of energy savings.

I am very willing to further participate in the discussion and am eagerly looking forward to any questions that you may have.

Kind regards,

Martin Vos.

Just a couple of quick clarifications:

Flicker definition

"Luminous flux modulation made perceptible by the motion of objects or by the motion of the observer's eye when the observer's eye is still."

What is the motion of a still eye?

12.1 Maximum Light Output

"Lamp light output on a dimmer/control shall not exceed the lamp's rated light output by more than 10% or fall below the maximum light output by more than 20%."

It's hard to understand the intent here, without the test method. Should the test result on a dimmer be compared to the lamp's rating or a test performed with no dimmer? That is, couldn't a lamp's light output with no dimmer exceed the lamp's rating by 10% due to component and/or mfg variations? Also, for the second half of this requirement, what is the "maximum light output" that serves as the baseline for comparison? This seems to read that the maximum light output shall not fall below the maximum light output. Again, hopefully the test method is written such that you test with no dimmer and then compare the result with the dimmer to the no dimmer result, with the requirement that the dimmed result fall within +10% and -20% of the no dimmer result.

Thanks,
Karl



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