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17-BSTD-01: Draft 2019 Building Energy Efficiency Standards (A RESPONSE)

Additional submitted attachment is included below.

From: Luke Price
To: [Energy - Docket Optical System](#); [Bozorgchami, Payam@Energy](mailto:Bozorgchami.Payam@Energy)
Cc: [John O'Hagan](#); "Wilkins, Arnold J."; "Jon McHugh"
Subject: 17-BSTD-01: Draft 2019 Building Energy Efficiency Standards (A RESPONSE)
Date: Monday, December 04, 2017 6:57:56 AM

Dear Sir/Madam,

17-BSTD-01: Draft 2019 Building Energy Efficiency Standards (A RESPONSE)

Public Health England (PHE) is interested in the health effects of light and lighting, and has been involved in research on flicker and modulation in lighting since 2008, and is often involved in policy and standards work at national, European and international level.

We support the views already given to the consultation by Professor Arnold Wilkins, and recognise the important work done by IEEE to translate scientific evidence into recommendations. This report compiled extensive data on numerous health-related and visual performance effects known to be due to flicker and modulation in lighting. Prof. Wilkins notes that these recommendations may actually be insufficiently stringent.

In the attached documents and in our work within the CIE (International Commission on Illumination), we have assessed the current LED market and suggested a practical metric, Physiological Percent Flicker or PPF, by which the recommendations of the IEEE could be implemented. This approach would also fit in very neatly with the requirement to report modulation amplitude at several cut-off frequencies.

We recommend that lighting products should not flicker at frequencies below approximately 100 Hz, which is more stringent than the IEEE recommendation, as these frequencies can have the most drastic health impacts on sufferers from epilepsy. At or above 100 Hz, a 3% PPF threshold closely corresponds to the IEEE "low risk" threshold and a 1% threshold corresponds to the "no observable effect level" threshold.

An overall simple approach would be to use a 0.2% PPF threshold at all frequencies, which still allows for considerable modulation depth at frequencies in the kHz range (i.e. if required for lumen control, dimming and Li-Fi applications), and no restriction on modulation depth above 10 kHz.

Kind regards,

Luke

Luke Price MSci MSLL
Senior Radiation Protection Scientist
Public Health England
UK

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