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Docket Number:	17-BSTD-02
Project Title:	2019 Title 24, Part 6, Building Energy Efficiency Standards Rulemaking
TN #:	222845
Document Title:	Appropriate Photometric Flicker metrics for Title 24
Description:	N/A
Filer:	System
Organization:	AccurIC /Dave Bannister
Submitter Role:	Public
Submission Date:	3/5/2018 10:57:48 AM
Docketed Date:	3/5/2018

Comment Received From: Dave Bannister

Submitted On: 3/5/2018

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Appropriate Photometric Flicker metrics for Title 24

Additional submitted attachment is included below.



Appropriate photometric flicker metrics for solid-state lighting products under Title 24 - a proposed way ahead

Docket No. 17-BSTD-02

Dave Bannister, MSc, MIEEE, CEO/CTO AccurIC Ltd. 5th March, 2018. daveb@accuric.com

Dear California Energy Commission,

Following recent submissions to the California Title 24 code and regulations process in respect of solid-state lighting quality, it is clear that reasonably and firmly-held differences of opinion exist in terms of which metric(s) should be published by manufacturers. Currently, the draft Title 24 regulations require products to meet a 30% modulation-depth maximum at frequencies up to 200Hz. However, alongside this low-frequency criterion, Joint Appendix JA10 calls for the disclosure of modulation-depth data at frequencies up to 1,000Hz. It does not state that products must meet any given standard relating to these wideband and subsequently filtered measurements. Nowhere in JA10 (or JA8) does it say 'Products sold into the State of California shall, in order to comply with Title 24, meet the requirements of IEEE Std 1789'. The requirement of this test procedure is to provide the Commission, Standards Bodies and the Public, with data relating to the wideband flicker performance of solid state lighting products. This data would thus provide a comprehensive database of current state of the art flicker performance, on the basis of which, the reasonableness or otherwise of competing standards can then be assessed. The measured and published data would therefore contribute significantly to the resolution of the very debate that is currently taking place between, for instance, proponents of IEEE Std 1789 (of which AccurIC is one) and proponents of NEMA 77, and in particular, its use of Stroboscopic Visibility Measure (SVM) as an alternative (or 'option') to Modulation Depth at various frequencies.

NEMA 77 (and in particular, its use of SVM) cannot, in our view, be presented as an alternative to carrying out and publishing the results of, the measurements specified in JA10. JA10 measurements provide the measured data, whereas SVM provides one proposed aggregation and interpretation of the data. The publication of data specified in JA10 would not preclude (particularly following a compromise proposal which follows) the subsequent calculation of SVM, as defined within NEMA 77. Whereas, the publication of SVM, as a single metric in place of the measurements specified in JA10 would mean loss of data (through irreversible aggregation). We therefore propose, in the interests of both compromise and full disclosure, that the time-domain data produced by the measurement procedure outlined in JA 10.5, be published, thereby enabling both the SVM metric and the filtered Modulation Depth data, to be calculated for each product. This would simultaneously provide the Commission with the data sought by JA10, as well as enabling standards bodies to make a proper assessment of the relative ease of measurement and utility of currently competing standards in respect of flicker at frequencies above 90Hz.

In summary, we would strongly encourage the publication of the baseline, unaggregated, unfiltered time-domain data, to allow all products to be assessed against the competing standards, whilst maintaining a 'level playing field' for all. If, however, the Commission takes the view that such a compromise would involve the storage and retention of too much data, then in light of the above, JA10 data should in our view, be required from all manufacturers.