April 5, 2017

Ms. Verena Radulovic
United States Environmental Protection Agency
Office of Air and Radiation
Washington, D.C. 20460

Dear Ms. Radulovic,

In response to your memo dated March 10, 2017, 3M is providing comments on Draft 1 of the ENERGY STAR® Version 8.0 Televisions specification. 3M applauds the EPA's effort to maintain robust and meaningful ENERGY STAR standards and appreciates the opportunity to comment, accordingly.

As background, 3M has been a global supplier of energy efficiency solutions for liquid crystal displays (LCDs) since before the first LCD TVs of the early 2000s, and 3M has been participating in the ENERGY STAR Television specification process since the first on-mode requirements were implemented for TVs in 2008. 3M's Display Materials and Systems Division has expertise in quantifying display quality and power consumption, and 3M maintains rigorous and aggressive sustainability goals as a corporation. In fact, 3M is recognized for its commitment to sustainability including: a 69% absolute reduction in greenhouse gas emissions since 2002 from company operations and purchased energy (Scope 1 and Scope 2 emissions); a 30% reduction in energy use from 2005 baseline (indexed to sales); and the prevention of more than 4.2 billion pounds of pollutants since launching its pollution prevention program in 1975.

Home Theater Displays (Section 1-A-2)
3M supports the inclusion of Home Theater Displays into the Television specification as defined in Draft 1 and has energy efficiency technology that can support LCD HTDs.

Luminance Requirements (3.6)
Luminance requirements have historically provided a visual quality counterbalance to the power consumption requirements of the ENERGY STAR Television standard. While 3M still believes that testing at fixed luminance (as is performed in the ENERGY STAR Displays standard) is the best way to evaluate the relative efficiency between televisions, the luminance requirements do provide some promise of minimum performance.

3M supports the addition of luminance requirements 3.6.3 and 3.6.4 for televisions with Automatic Brightness Control (ABC) enabled by default. There are few published data regarding optimal peak television luminance in dark room viewing conditions. The TCO Display standard

(http://tcodevelopment.com/files/2015/11/TCO-Certified-Displays-7.0.pdf) is not a television standard, but it is a global display ergonomics standard that requires compliant displays to have the capability to achieve 100 cd/m^2 in a dark room. It stands to reason that TCO does not have eye-strain concerns for such luminance levels in a dark room if they require the capability in their standard. Also, current High Dynamic Range (HDR) standards like HDR10 and Dolby Vision require minimum peak luminance levels of 1000 cd/m^2 and 4000 cd/m^2 (with higher future requirements), respectively (https://www.usatoday.com/story/tech/2016/08/17/hdr10-vs-dolby-vision-new-tv-format-war/88914196/). HDR is a technology that is intended to be used in a variety of environments including darkened home theater settings, and these peak luminance levels are not of concern to the organizations establishing these standards. On a side note, these peak luminance requirements for HDR are possibly at least part of the reason why the EPA has heard comments that HDR is incompatible with ABC technology.

On-Mode Power Thresholds (3.3.1)

In light of the intended March 2018 implementation date of ENERGY STAR Televisions Version 8.0 and the newly proposed luminance requirements, 3M is supportive of maintaining Version 7.0 on-mode power requirements. Luminance data are not reported for qualified televisions with ABC enabled by default at 3 lx illuminance, so maintaining power requirements is reasonable as the industry resets and data are collected for new models. If through the draft process, however, those luminance requirements become less restrictive, the topic of on-mode power thresholds should be revisited.

Energy Saving Features (3.2.3)

3M agrees with the notion that energy savings features should provide an energy savings benefit in actual use as opposed to under the IEC test clip only. While the IEC test clip is intended to be the standard for "real world" viewing, the EPA has demonstrated that this is not the case when it comes to Motion Detection Dimming as implemented in the tested TVs. The frequent changing of scenes in the IEC test clip likely contributes to the discrepancy observed. Unfortunately, there is not likely to be a new, agreed-upon standard test clip in time for implementation. Directionally, 3M thinks that more should be done in future revisions to incentivize energy savings technologies that cannot be turned off, that provide a good viewing experience, and that provide benefit under all viewing conditions. Improved LED efficacy, improved LCD panel transmission, improved OLED efficacy, and the use of reflective polarizers in LCDs are all examples of such technology.

Thank you for your consideration of these comments. 3M is eager to assist and cooperate with the EPA during the revision process. Accordingly, if any questions arise with regard to our comments or if we can assist in any other manner, please don't hesitate to contact us directly.

Sincerely,

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