



August 27, 2008

Mr. Christopher Kent  
United States Environmental Protection Agency  
Office of Air and Radiation  
Washington, D.C. 20460

Dear Mr. Kent:

In response to your memo dated July 24, 2008, 3M is providing input on Draft 1 of ENERGY STAR Program Requirements for Displays Version 5.0. We appreciate the opportunity to provide comments, and we continue to support the EPA's efforts to improve energy efficiency in display devices.

Our primary recommendations are:

1) The default luminance level at which the on mode power consumption is measured must be defined. We recommend keeping the 175 cd/m<sup>2</sup> minimum luminance setting from the 4.1 standard as the default luminance level for on mode power measurement. The ENERGY STAR requirement should provide a luminance value as an industry standard default luminance to define the specification fully and to maintain the rigor of the test method. If left unspecified, the default luminance value may result in confusion about the regulation in the market.

2) The luminance setting for on mode power measurement should typical monitor usage. To achieve this, we recommend a default luminance of 175 cd/m<sup>2</sup> for monitors with diagonal dimensions less than 24 inches. This brightness value is typical of standard consumer and corporate monitor usage. Above 24 inches, display usage varies more by application and should satisfy the needs of expert users, graphics display, longer viewing distances, and information signage. A higher typical luminance requirement may be needed at 24 inches and above. Therefore we recommend including 24 inch diagonal displays in the large display category.

Setting the minimum luminance for on mode power consumption at 175 cd/m<sup>2</sup> will set a reasonable, attainable, and meaningful target for the high volume segment of the market. More details, as well as other comments, are offered in the section comments below.

### **Section 3.A.1 – On Mode Requirements**

We support the inclusion of area and resolution as variables in the power calculation. This should give the Version 5.0 requirements flexibility to account for the variety of displays coming into the marketplace. This is an important feature given the range of sizes the standard attempts to address.

### **Section 3 Table 1**

We recommend setting the category boundaries at 24 inches rather than 30 inches. For example, a category boundary of greater than or equal to 24 inch diagonal is recommended for the third category. This would define the boundary based on LCD backlight construction. 24 inch and larger displays are direct lit, while less than 24 inch displays are edge lit. This would improve the data fit for the mainstream monitor sizes and drive efficiency improvements for the highest power computer monitors. With this consideration, there is a natural commonality between TV technology and the monitor sizes greater than or equal to 24 inches.

### **Section 3 Table 1**

The Table 1 equations are not meaningful if they were calculated with the default luminance values from the data set. This is because the default luminance is not defined. These equations for “Maximum On-Mode Power Consumption” should be recalculated based on the ENERGY STAR 4.1 powers (measured at 175 cd/m<sup>2</sup> minimum axial luminance) reported in the data set. The ENERGY STAR 4.1 power consumption numbers better reflect the efficiency of monitors after they are adjusted to a typical use level.

### **Section 4.F – Power Measurement Protocols**

In order to facilitate the convergence of larger displays and televisions, it is requested that the guideline for the approved power meter be adopted from Version 3.0 ENERGY STAR TV specification.

### **Section 4.F – Power Measurement Protocols**

A minimum warm-up time is specified, but there is not a burn-in period specified for the device. This leads to uncertainty and difficulty when confirming ENERGY STAR compliance. Displays lose significant luminance in the first 50 - 100 hours of operation. In essence, the factory default luminance changes over the life of the display. This uncertainty is a consequence of not specifying a minimum display luminance test parameter. Therefore, a 175 cd/m<sup>2</sup> minimum luminance setting is recommended for on mode power consumption measurements.

## **Section 4.G – Luminance Test Patterns and Procedures**

Since no luminance value is fixed for the on mode power measurement, the ENERGY STAR Requirements do not provide goals for display efficiency. Use of “default settings” removes efficiency criteria from the standard and encourages compliance simply by changing default settings. This does not reward the best-in-class devices. There is concern that the language in the boxed note will not be strictly interpreted leading to displays set to lower luminance values. If the default luminance is too low the display is not usable. This would lead the users to setting higher brightness levels thereby negating the intent of the requirements. We recommend that a minimum factory default luminance should be specified, or that the 175 cd/m<sup>2</sup> measurement condition from ENERGY STAR 4.1 should be kept in Section G. This would assure fitness for use similar to TCO Development requirements.

### **Data Set**

In reviewing the charts provided with the draft specification, it is noted that there are a few extraneous data points. Closer review reveals area calculation errors for devices 66, 67, 70, 71, 72, 73, 111, and 112. It is also necessary to reconcile conflicts between some aspect ratios and resolutions in the data set.

Thank you for your consideration of these comments. We look forward to cooperating with the EPA during this process. As questions arise around these comments, please contact us for further discussion.

Sincerely,

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