

## Comments from TCO Development on Energy Star draft 5.0 for displays

### §3 Energy-efficiency specifications for qualifying products

I'm skeptic to the way of calculating the power in on-mode for LCD displays. The principle of an LCD display is a number CCFL's shining into a light guide (transparent plastic plate). The light comes out of the light guide and passes an LCD crystal and some passive filters. The bigger the screen size is the more CCFL's is necessary to create a uniform and bright light behind the LCD crystal. The LCD crystal itself consumes very little energy to turn each pixel on or off.

Thus, the power consumption should mainly be related to the amount of CCFL's which means the screen size.

The reason you find a correlation between the pixel density and the power consumption is that manufacturers normally use a standardized pixel density for each screen size:

4:3 format

<17" = 800x600

<19" = 1024x768

<20" = 1280x1024

>20" = 1600x1200

For LCD this may give a false vision that the pixels are consuming the power but if you look in detail how and LCD is constructed you realize that it is not true. For other display technologies like plasma I agree that each pixel is consuming energy because the light is produced in the pixel itself.

### **Conclusion**

Your way of calculating with make it difficult for Large LCD displays with low resolution to pass the criteria and it will make it too simple for small LCD screens with high resolution to pass.

When you talk about the area "A" it is not clear that it is defined in square inches until you read the example at the bottom of page 6.

I think you should use the SI-units mm, cm, m instead of inch as the standard is used on a world wide basis.

#### **§4G Luminance test pattern and procedures**

In the process of verifying and certifying products it is very important to have repeatability between test labs and technicians. It is very difficult to have repeatability if the technician shall check visually that the white and near gray level can be distinguished. The ability to distinguish different gray levels depends on many things such as visual quality, age, attitude towards the task etc...

#### **Conclusion**

I suggest the different gray levels are measured by a luminance meter and the acceptable difference in candelas per square meter is defined.

#### **§4J test method**

If the test method shall be complete it should include an instruction on how to measure the “default as-shipped” luminance. This instruction should be introduced between number 4 and 5 in the method.

*Kind regards,*

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