

SEMI D22-1103

TEST METHOD FOR THE DETERMINATION OF COLOR, TRANSMITTANCE OF FPD COLOR FILTER ASSEMBLIES

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NOTICE: This Document was completely rewritten in 2003.

1 Purpose

1.1 This standard establishes practices for measuring selected characteristics of FPD color filters. These methods are applicable to manufacturing, quality control, and development operations.

2 Scope

2.1 This method is to be used by FPD color filter suppliers and users to evaluate quality of products as well as items under development.

2.2 This method shall be used in general to measure the color characteristics and transmittance of FPD color filter.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Referenced Standards and Documents

3.1 SEMI Standards

SEMI D13 — Terminology for FPD Color Filter Assemblies

3.2 CIE Standards¹

CIE 1931 — Standard Colorimetric System (Colorimetry – Official Recommendations of the CIE)

CIE 1976 (L*,a*,b*) — Color Space (Recommendations on Uniform Color Spaces)

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

4 Summary of Method

4.1 Turn on the apparatus, and input measurement parameters.

4.2 Warm up and stabilize the equipment.

4.3 Measure the reference quantity of light.

4.4 Set the sample on the measuring stage, and adjust the point of measurement into the measuring spot.

4.5 Measure the sample quantity of light.

4.6 Print the results (color characteristics and transmittance).

5 Apparatus

5.1 The measurement system shall have the following specifications.

5.2 Wavelength range: variable between 380 and 780 nm, in increments of <5nm.

5.3 Measuring area: Measuring spot size or the spot size of incident beam on the sample surface is smaller than the sub-pixel to be measured (for example, 2 to 50 micrometer in diameter).

¹ CIE International Commission on Illumination, Kegelgasse 27, A-1030 Vienna, Austria

5.4 Sample stage:

5.4.1 Sample surface can be set normal to the incident beam. (See Figure 1.)

5.4.2 The sample stage shall have a sufficient mechanical travel to permit measurements within the color filter area and in the transparent area of the substrate outside the color filter material.

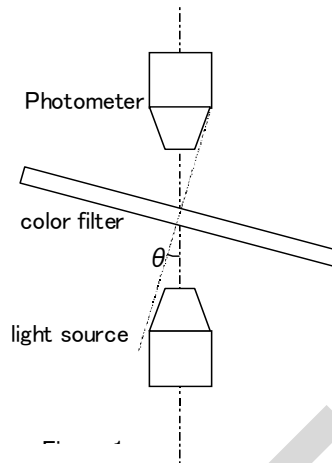


Figure 1

6 Reference

6.1 Reference quantity of light shall be measured with a substrate without object layer.

6.1.1 For example, substrates described below can be adopted for reference.

- Ex. A glass substrate for color filter
 A glass substrate out of the color filter area

6.1.2 As for the definition of glass substrate, refer to D13.

7 Calibration

7.1 Calibrate the apparatus in accordance with manufacturer's instructions.

7.2 Record characteristics of the instrument observed during this calibration, for example, linearity, wavelength shift, etc.

8 Procedure

8.1 Turn on the apparatus and input the measurement condition parameters.

- | | |
|-----------|-----------------------------|
| Condition | Wavelength range |
| | Spot size |
| | Gain, Integration time etc. |

8.2 Before operation, warm up and stabilize the equipment for a specified period of time (according to the instruction manual of the apparatus).

8.3 Measure the reference data (dark quantity of light, reference quantity of light).

8.4 Set the sample onto the stage and adjust the sample to the measuring position.

8.5 Measure quantity of light of the sample.

8.6 Record the data.