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BSI Standards Publication

Electronic display devices

Part 2-3: Measurements of optical properties — Multi-colour test patterns

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee EPL/47, Semiconductors.

A list of organizations represented on this committee can be obtained on request to its secretary.

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TECHNICAL REPORT

colour inside

Electronic display devices –
Part 2-3: Measurements of optical properties – Multi-colour test patterns

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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IEC TR 62977-2-3, which is a technical report, has been prepared by IEC technical committee 110: Electronic display devices.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
110/781A/DTR	110/800A/RVDTR

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62977 series, published under the general title *Electronic display devices*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Current display measurement standards mainly use simple test patterns to estimate the display performance. These test patterns would typically contain only one colour, or a colour with a black background. However, as recent research has shown, modern display electronics can be content-aware, and adjust the display rendering based on the input image content. Therefore, multi-colour test patterns that more closely simulate realistic image content are recommended in order to better represent the display performance.

This Technical Report discusses the impact of the display drive electronics and image processing on the display rendering behaviour, and reviews research results that demonstrate the need for multi-colour test patterns and average picture level loading considerations.

ELECTRONIC DISPLAY DEVICES –

Part 2-3: Measurements of optical properties – Multi-colour test patterns

1 Scope

This part of IEC 62977, which is a Technical Report, reviews the impact of test pattern colour content and image loading on the measured display's photometric and colorimetric performance. Experimental data for several display technologies is presented to demonstrate the need for using a broader range of colours in the test patterns, and measuring the display at an image loading level appropriate for the intended application.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1 Terms and definitions

3.1.1
signal pixel
smallest encoded picture element in the input image

3.1.2
pre-gamma average picture level
average input level of all signal pixels relative to an equivalent white pixel driven by a digital RGB input

Note 1 to entry: Unless otherwise stated, the pre-gamma average picture level (APL) will simply be referred to as average picture level in this document.

Note 2 to entry: the APL will normally be expressed as a percentage, where a full white screen at maximum drive level would be 100 % APL.

3.2 Abbreviated terms

APL average picture level
CIE Commission Internationale de L'Eclairage (International Commission on Illumination)
LUT look-up tables
OLED organic light emitting diode
RGB red, green, and blue
sRGB standard RGB colour space as defined in IEC 61966-2-1
WRGB white, red, green, and blue