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colour inside

Electronic displays –
Part 3-1: Evaluation of optical performances – Colour difference based viewing direction dependence

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS IEC 62977-3-1, which is a technical specification, has been prepared by IEC technical committee 110: Electronic displays.

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

Draft TS	Report on voting
110/1003/DTS	110/1065/RVDTS

Full information on the voting for the approval of this technical specification 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 the parts in the IEC 62977 series, under the general title *Electronic displays*, can be found on the IEC website.

Future documents in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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- withdrawn,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

This document aims to provide a measurement method that determines the display angular dependence after colour and white reference adaptation and provides an evaluation of differences in a uniform colour space.

This document facilitates the cross-industry measurement of the viewing direction dependence of colour displays. Several studies [6 to 9][1] have indicated that the contrast ratio (CR > 10:1) is, from a visual quality point of view, not useful to determine the viewing direction range for matrix displays. When colour differences are included in a viewing direction metric, the correlation between the metric value and a visual assessment value is significantly increased [10]. A more recent study [11] revealed that a metric, combining viewing-direction related luminance degradation and colour deviation can accurately predict the relative change in the visual assessment value. This information is the basis for the determination of the viewing direction range, which has relevance from a visual quality point of view.

NOTE "Viewing direction range" is sometimes referred to as "viewing angle". Although technically incorrect, for legacy reasons the terms is considered equivalent.

[1] Numbers in square brackets refer to the Bibliography.

ELECTRONIC DISPLAYS –

Part 3-1: Evaluation of optical performances – Colour difference based viewing direction dependence

1 Scope

This part of IEC 62977 specifies the evaluation method of the viewing direction characteristics of electronic display devices under dark-room conditions. More specifically, this document focuses on the evaluation of the viewing direction characteristics based on colour difference.

This document applies to colour matrix displays, which are based on transmissive or emissive technologies.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11664-1, *Colorimetry – Part 1: CIE standard colorimetric observers*

ISO 11664-4, *Colorimetry – Part 4: CIE 1976 L*a*b* Colour space*

ISO/CIE 11664-6:2014, *Colorimetry – Part 6: CIEDE2000 Colour-difference formula*

CIE 159, *A colour appearance model for colour management systems: CIECAM02*

CIE 168, *Criteria for the evaluation of extended-gamut colour encodings*