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Multimedia systems and equipment – Colour measurement and management – Part 13: Measurement method of display colour properties depending on observers

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MULTIMEDIA SYSTEMS AND EQUIPMENT – COLOUR MEASUREMENT AND MANAGEMENT –

Part 13: Measurement method of display colour properties depending on observers

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IEC TS 61966-13 has been prepared by technical area 2: Colour measurement and management, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
100/3928/DTS	100/4023/RVDTS

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

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61966 series, published under the general title *Multimedia systems and equipment – Colour measurement and management*, 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document 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.

The content of the corrigendum 1 (2025-03) has been included in this copy.

INTRODUCTION

In colorimetry, metamerism or metameric failure is defined as a perceived matching of two colours with different spectral power distributions (SPDs). Illuminant metamerism occurs when two objects match in colour under a specific illuminant, but mismatch under another illuminant with a different SPD. Likewise, observer metamerism (OM) is defined by two stimuli with different SPDs that match in colour for a specific observer. However, the stimuli might not match for another observer. OM is caused by the normal variations in the spectral responsivities of various observers. In other words, observers do not have identical colour-matching functions (CMFs). An observer model that takes into consideration the age and the field size of observers with respect to a standard observer standard observer has already been standardised in the CIE (CIE Pub. 170-1:2006).

Meanwhile, display manufacturers and users have required measurement methods of the OM which occurs in display uses. For example, with the development of display technology and grafting of display technology to various application fields and mass distribution, it has become a common situation for users to use multiple displays at the same time. When using multiple displays at the same time, a user can display the same colour through the calibration process. However, this is only valid for certain observers because of OM. Also, when users watch a single display, there could be observer dependency in colour perception even though the display is calibrated.

Based on the CIE standards and research results of OM, a new Technical Specification is suggested to measure the difference in display colour properties according to the observer in an objective way, excluding subjective effects of evaluators.

MULTIMEDIA SYSTEMS AND EQUIPMENT – COLOUR MEASUREMENT AND MANAGEMENT –

Part 13: Measurement method of display colour properties depending on observers

1 Scope

This document defines an objective colour difference metric and a measurement method for observer metamerism caused by displays with different spectral power distributions. This document also specifies the measuring equipment, conditions and methods that are necessary to obtain the metric. This document applies to light-emitting or backlit transmitting colour displays measured under dark-room conditions.

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

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

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

CIE 170-1:2006, *Fundamental chromaticity diagram with physiological axes – Part 1*

CIE 170-2:2015, *Fundamental chromaticity diagram with physiological axes – Part 2*