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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Multimedia systems and equipment – Colour measurement and management – Part 12-1: Metadata for identification of colour gamut (Gamut ID)

Systèmes et appareils multimédias – Mesure et gestion de la couleur – Partie 12-1: Métadonnées d'identification des gammes de couleurs (Gamut ID)

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FOREWORD

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International Standard IEC 61966-12-1 has been prepared by technical area 2: Colour measurement and management, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This second edition cancels and replaces the first edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) ITU-R BT.2020 colour spaces added in Clause 6;
b) ITU-R BT.2100 colour spaces added in Clause 6.

The text of this International Standard is based on the following documents:

CDV	Report on voting
100/3126/CDV	100/3375/RVC

Full information on the voting for the approval of this International Standard 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 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 "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- withdrawn,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.

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INTRODUCTION

New technologies in capturing and displaying wide-gamut colour images enable a new market of wide-gamut video colour content and high dynamic range video content creation. Recent video standards for wide gamut colour space encoding such as ITU-R BT.2020 (UHDTV) and IEC 61966-2-4 (xvYCC) were established in order to be able to distribute content with a colour gamut that is extended with respect to classical colour gamuts such as defined by colorimetry standards ITU-R BT.601 (standard-definition television) and ITU-R BT.709 (high-definition television). Recent video standards for high dynamic range (HDR) colour space encoding, such as ITU-R BT.2100, were established in order to be able to distribute content with a colour gamut and a dynamic range that are both extended with respect to classical colour encoding, such as that defined by ITU-R BT.709. With the increasing popularity of wide gamut and high dynamic range content and displays, the variety of colour gamuts of displays is expected to increase. This issue can be an obstacle for adopting wide-gamut video colour content in professional content creation since the compatibility of the content to the employed displays as well as the compatibility among different displays is not ensured. The term display includes here any video colour reproduction equipment, such as direct view displays and projectors. Thanks to improvements of technology, the variety of colour gamut and colour reproduction capacities of displays increases, while the colour gamut and the colour encoding rules of existing colour space encoding standards are fixed.

To address this issue, this document specifies a colour gamut metadata scheme for video systems including information for colour reproduction. This metadata can amend a video content or a display. More specifically, improvements can be achieved if the wide-gamut colour content is created with the knowledge of the display colour gamut as well as if the colour reproduction in the display is done with the knowledge of the colour gamut of the pictorial content.

This document permits video systems to define their own colour gamut. This document defines necessary metadata that allows managing inhomogeneous video systems with different colour gamuts. This document generalizes existing colour space encoding standards having a fixed colour gamut.

MULTIMEDIA SYSTEMS AND EQUIPMENT – COLOUR MEASUREMENT AND MANAGEMENT –

Part 12-1: Metadata for identification of colour gamut (Gamut ID)

1 Scope

This part of IEC 61966 defines the colour gamut metadata scheme for video systems and similar applications.

The metadata can be associated with wide-gamut video colour content or to a piece of equipment to display the content.

When associated with content, the colour gamut metadata defines the gamut for which the content was created. It can be used by the display for controlled colour reproduction even if the display's colour gamut is different from that of the content.

When associated with a display, the colour gamut metadata defines the display colour gamut. It can be used during content creation to enable improved colour reproduction.

The colour gamut metadata can cover associated colour encoding information, which includes all information required for a controlled colour reproduction, when such information is not provided by the colour encoding specification.

The colour gamut metadata scheme provides scalable solutions. For example, more flexible solutions will be used for the professional use, while much simpler solutions will be used for consumer use with easier product implementation.

This part of IEC 61966 only defines the colour gamut metadata scheme. Vendor-specific solutions for creation and end-use of this metadata are allowed.

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.

IEC 60050-845, *International electrochnical vocabulary – Chapter 845: Lighting*

IEC 61966-2-4:2006, *Multimedia systems and equipment – Colour measurement and management – Part 2-4: Colour management – Extended-gamut YCC colour space for video applications – xvYCC*

ISO 15076-1:2010, *Image technology colour management – Architecture, profile format and data structure – Part 1: Based on ICC.1:2010*

ITU-R BT.709, *Parameter values for the HDTV standards for production and international programme exchange*

CIE 15:2004, *Colorimetry*

SMPTE 274M:2005, *SMPTE Standard for Television - 1920 x 1080 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates*

ITU-R BT.2020, *Parameter values for ultra-high definition television systems for production and international programme exchange*

ITU-R BT.2100, *Image parameter values for high dynamic range television for use in production and international programme exchange*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-845 and the following 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

3.1.1
content
video content in production, post-production or consumption

3.1.2
gamut
solid in a colour space

Note 1 to entry: A solid in a colour space, such as specified by ITU-R BT.2100, can contain colours with high luminance.

3.1.3
gamut boundary description
description of the boundary of a colour gamut

3.1.4
radiometrically-linear colour space coordinates
colour space coordinates that are linear with respect to image radiance

3.2 Abbreviated terms

GBD gamut boundary description
LSB least significant bit
MSB most significant bit
GI gamut instance
GH gamut hull
GC gamut component

4 Overview

This document specifies metadata called "Gamut ID metadata" providing information on an actual colour gamut.

The Gamut ID metadata contains four parts and its format is summarized in Table 1.