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Australian Standard®

Graphic technology—Displays for colour proofing—Characteristics and viewing conditions

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The following are represented on Committee EX-004:

- Australian Paper Industry
- Lithographic Institute of Australia, NSW
- Printing Industries Association of Australia
- TAFE NSW

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PREFACE

This Standard was prepared by the Standards Australia Committee EX-004, Graphic Technology.

The objective of this Standard is to specify the minimum requirements for the characteristics of displays to be used for soft proofing of colour images.

This Standard is identical with, and has been reproduced from ISO 12646:2008, *Graphic technology—Displays for colour proofing—Characteristics and viewing conditions* and its Amendment 1 (2010), which is added at the end of the source text.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover, title page and each page, while the International Standard number appears only on the cover.

(b) In the source text 'this International Standard' should read 'this Australian Standard'.

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References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian Standard*	
ISO		AS ISO	
3664	Graphic technology and photography—Viewing conditions	3664	Graphic technology and photography—Viewing conditions

The term 'informative' has been used in this Standard to define the application of the annex to which it applies. An 'informative' annex is only for information and guidance.

CONTENTS

INTRODUCTION

The ability to match colour images displayed on colour monitors to the images produced when the same digital file is rendered by proofing and printing systems (commonly referred to as “soft” proofing) is increasingly expected in graphic arts. Obtaining such a match is not simple and to be fully accurate requires careful control of many aspects of the process. The primary purpose of this International Standard is to make recommendations with respect to the soft proof viewing conditions. If these are controlled, it is then possible for users to exchange meaningful calibration (3.1.1) and characterization (3.1.2) data such that a consistent and, possibly, accurate colour match to the hard copy proof is achieved. In the case of visual display devices the RGB device values are related to CIE tristimulus values.

The appearance of a colour image on a colour display is influenced by many physical factors other than controlled ambient viewing conditions. Among the most important of these are uniformity, convergence, size and resolution (in order to permit rendition of the proof at close to its normal size and with the finest detail visible on the hard copy at normal viewing distances), variation of electro-optical properties with viewing direction, freedom from flicker and glare (specular reflections with distinct images), the opto-electronic calibration of the display and the settings of its display driver software. So, to be acceptable as a proofing system which provides a reasonable level of image quality, the display must also exhibit these properties at an acceptable quality. This International Standard is based on the use of the flat panel display (FPD) and cathode ray tube display (CRT) technologies. It specifies the requirements for factors such as uniformity, convergence, refresh rate, size and spatial resolution. However, since these parameters are subject to improvement as display technology changes, this International Standard only defines minimum requirements for these parameters. It is assumed that displays used for this purpose will always conform to accepted industry “standards” for computer-aided design (CAD), and generally provide quality levels considered acceptable for this purpose, where they offer an improvement over the specifications herein.

Note that, even for displays of the highest quality, the appearance of the displayed image will be limited by the accuracy of the colour transformation used for converting the digital file from its encoded colour space to that required for display purposes. This International Standard provides no formal specifications for these transformations, although the issues are discussed in an informative annex (Annex A), together with recommendations for achieving an acceptable colour transformation.

This International Standard only considers the setting up of colour displays as “soft” proofing devices. It primarily focuses on applications where the displayed image will be directly compared to a hard copy. However, in some practical situations, the image on the screen is evaluated in the absence of a hard copy. In this International Standard examples of two practical use cases are described. The first concerns the comparison of a soft proof with a hard copy proof; the second concerns the viewing of displayed images independently of any hard copy image. For the viewing of displayed images independently of any hard copy image, less restrictive requirements are sufficient, and they are stated separately in this International Standard. This viewing is therefore concerned with modifying the “hard” and “soft” controls of the display to enable it to simulate a proof. In this sense it can be looked on as a “slave” device. However, it is in the interests of a CAD user, where the colour display in a real sense “originates” from the image, to set up the display in a similar way. This will enable simpler optimization of the colour transformation to the selected hard copy system used for rendering the image, in order to produce an accurate reproduction, if this is an important requirement. However, it is possible to undertake image processing to modify the image when rendered to make it look like the displayed image (colour gamuts permitting) whatever the opto-electronic calibration of the display. This is briefly discussed in Annex A.

Users of this International Standard will also benefit from CIE Publication 122[14]. Those unfamiliar with the judgment of displays may also find it helpful to read IEC 61223-2-5[9] which contains much useful detailed information about evaluation and testing of image display devices.

AUSTRALIAN STANDARD

Graphic technology—Displays for colour proofing—Characteristics and viewing conditions

1 Scope

This International Standard specifies the minimum requirements for the characteristics of displays to be used for soft proofing of colour images. Included are requirements for uniformity, convergence, refresh rate, display diagonal size, spatial resolution and glare of the screen surface. The dependence of colorimetric properties on the electrical drive signals and viewing direction, especially for flat panel displays, is also specified.

2 Normative references

The following referenced documents are indispensable for the application 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 3664, *Graphic technology and photography — Viewing conditions*

ISO 13655:—[1)], *Graphic technology — Spectral measurement and colorimetric computation for graphic arts images*

ISO 15790, *Graphic technology and photography — Certified reference materials for reflection and transmission metrology — Documentation and procedures for use, including determination of combined standard uncertainty*

CIE Publication 15, *Colorimetry*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

3.1.1
calibration
operation of establishing that the measured values agree with the values specified by a standard or a characterization process

3.1.2
characterization
process of relating device-dependent colour values to device-independent colour values

1) To be published. (Revision of ISO 13655:1996)