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Graphic technology — Requirements for colour soft proofing systems

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 130, *Graphic technology.*

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Introduction

The use of images displayed on a colour monitor is increasingly being used in the graphic arts industry for colour evaluation and colour acceptance (commonly referred to as “soft” proofing). This requires that the colour display and its associated viewing environment be able to simulate the appearance of the final printed image viewed under standard graphic arts viewing conditions. The major components required to accomplish this are assembled to create a soft proofing system which is usually comprised of a monitor, colour measurement device, driving software (for calibration, profiling the monitor, and displaying the data), and a viewing cabinet. The overall design and calibration has to control and take into account the influence of ambient lighting.

As the use of soft proofing increases, the need for an objective and vendor neutral assessment of soft proofing systems is steadily increasing. This International Standard specifies requirements for systems that are used to produce, from digital data, images on electronic displays that are intended to simulate a characterized printing condition defined by a set of characterization data and spot colours defined by a physical reference.

This International Standard builds on the monitor requirements defined in ISO 12646, the viewing cabinet defined in ISO 3664, and the requirements for contract hard copy proofing defined in ISO 12647-7.

Three common soft proof scenarios are typically encountered. In the first scenario, a soft proof is displayed on a monitor without an associated viewing cabinet. In the second scenario, a viewing cabinet is associated with the monitor. In the third, the monitor is a part of, and built-into, a viewing cabinet. To test how closely the displayed image simulates the encoded colorimetric data of the original, there is no need to differentiate between these three scenarios. However, to assess the similarity of the soft proof reproduction (as described in this standard) to a reference print, a viewing cabinet or controlled room lighting is required.

The objective assessment of a soft proofing display system is carried out in three steps. First, the monitor and the viewing cabinet are tested to ensure that these components are capable of achieving the results needed to produce a high quality soft proof. Second, the capability of the combination of the monitor and the display driving software is tested. Third, the simulation of an output condition, usually a characterized printing condition, is assessed.

With respect to the data handling and display driving software, a separation is made between the driving of the display and the simulation of a given colorimetric reference, termed simulation. The primary focus of the display driving software lies in the accurate characterization of the display. This is typically accomplished by a contact measurement device.

Once the display device itself is evaluated, the integration of the display and any associated viewing cabinet (or a room lighting setup to function as a viewing cabinet) and the effect of ambient lighting has to be evaluated. The simulation of an intended characterized printing condition represents the colorimetry of the display as seen from the viewer position. For that reason, telespectroradiometric readings are required at this stage of evaluation.

The use of a display and an associated viewing cabinet and/or the display integrated into a hard copy viewing cabinet often occurs in situations where a printed product, like a newspaper or offset print, is being evaluated with respect to the soft copy proof in the absence of a hard copy proof. In this case, there is active research as to how a concrete document can be shown reliably in order to facilitate it as a contract proof or reference in disputes of colour difference.

The use of a standalone display in uncontrolled ambient lighting is not subject of this International Standard because the final visual appearance of a soft proof on a display cannot be judged without taking into account the influence of the ambient light, even when the soft proof is viewed alone, without comparison to a physical object like a proof print, production print, or product sample.

Obtaining a good soft proof simulation of a reference 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 establish the criteria and tolerances needed to evaluate a complete soft proofing system.

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Graphic technology — Requirements for colour soft proofing systems

1 Scope

This International Standard specifies requirements for systems that are used to produce, from digital data, images on electronic displays that are intended to simulate a characterized printing condition defined by a set of characterization data and spot colours defined by a physical reference. Recommendations are provided with regard to equipment selection, setup, operating, and environmental conditions. Appropriate test methods associated with these requirements are specified.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 12639, *Graphic technology — Prepress digital data exchange — Tag image file format for image technology (TIFF/IT)*

ISO 12646, *Graphic technology — Displays for colour proofing — Characteristics and viewing conditions*

ISO 12647-7, *Graphic technology — Process control for the production of half-tone colour separations, proof and production prints — Part 7: Proofing processes working directly from digital data*

ISO 15930, *Graphic technology — Prepress digital data exchange using PDF*

3 Terms and definitions

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

3.1
display
electronic device capable of visibly communicating information

3.2
characterized printing condition
printing condition for which process control aims are defined and for which the relationship between input data (printing-tone values, usually CMYK) and the colorimetry of the printed image is documented

[SOURCE: ISO 15930-8:2010, 3.1]

3.3
power off
condition in which the *display* (3.1) is switched off

3.4
soft proof
visualization of colour image data using a *display* (3.1) with the intent of synthesizing the colour appearance under a defined illumination and viewing condition

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