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Imaging materials — Methods for measuring indoor light stability of photographic prints —

Part 3: LED lamp exposure

Matériaux pour l'image — Méthodes de mesure de la stabilité de la lumière en intérieur des épreuves photographiques —

Partie 3: Exposition à une lampe LED

Reference number
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Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms, definitions and abbreviations ... **1**
3.1 Terms and definitions ... 2
3.2 Abbreviations ... 2
4 Requirements for exposure devices ... **2**
4.1 Safety cautions ... 2
4.2 Irradiance uniformity ... 2
4.3 Relative humidity ... 2
4.4 Temperature ... 3
4.5 Air quality in the test environment ... 3
4.6 Duration of exposures ... 3
5 Test specimens ... **3**
6 Exposure conditions ... **3**
6.1 General ... 3
6.2 Tests for LED illumination for home, office, commercial display and school applications ... 3
6.2.1 LED lamps ... 3
6.2.2 Illuminance, temperature, and relative humidity ... 4
6.3 Tests for LED illumination for gallery, museum, and archive applications ... 5
6.3.1 LED lamps ... 5
6.3.2 Illuminance, temperature, and relative humidity ... 6
6.4 Information regarding radiant exposure and changes in LED lamps over time ... 6
7 Test report ... **6**
7.1 Light stability reporting requirements ... 6
7.2 General reporting considerations ... 7
Annex A (informative) **Image permanence tests of photographic prints under LED lighting** ... **8**
Annex B (informative) **Colour rendering indices for LED lighting** ... **9**
Annex C (informative) **White LED lighting technology** ... **12**
Bibliography ... **14**

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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 document 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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 42, *Photography*.

A list of all parts in the ISO 18937 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The ISO 18937 series of test methods has been written for the determination of the indoor light stability of photographic prints. ISO 18937-3 is an addition to the series due to the increasing importance of LED lighting.

This test method is important to the end users of LED lamps for various use cases: home, office, and commercial applications; and museum, gallery, archive, and other cultural heritage applications. In addition, manufacturers of printers and printing materials will be able to use this method to test and to improve their print materials, equipment, and processes. As a reference for LED testing of photographic prints, Annex A provides a summary of two published test studies.

The type of light source specified for use in this document is an LED lamp with a relative spectral irradiance that conforms to one of the Tables 1 or 3 for the two groups of use cases. See Annexes B and C for descriptions and explanations of LED lighting technology, the ability of LED lights to render colours, and the metrics by which colour rendering are assessed.

Phosphor-converted blue LED lamps represent the majority of LED lamps used for the general lighting use case. These lamps are relatively low in price, have high electrical efficiency, and many of them can provide high colour rendering with R_a of 90+. These LED lamps are available in a variety of correlated colour temperatures (CCT), and some of the lamps are tunable and may be set by the user to several CCT values. These choices of CCT may be influenced by the time of day, individual preferences, as well as cultural and geographic customs. For this use case group a CCT of 5 000 K, which corresponds to natural outdoor daylight in the early morning or late afternoon, is specified.

Museums, galleries, and archives often use LEDs of approximately 3 000 K CCT because their light is similar in appearance to that of the tungsten-halogen lamps that have been adopted for most display applications in recent years. Some of the lamps used in these applications have extremely high colour rendering, with R_a of 98+. For this use case group, phosphor-converted blue LED lamps with a CCT of 3 000 K are specified. The LED lamps as specified in Tables 1 and 3 have very little UV content.

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Imaging materials — Methods for measuring indoor light stability of photographic prints —

Part 3:
LED lamp exposure

1 Scope

This document describes test methods for measuring the light stability of photographic prints when subjected to LED illumination sources under conditions that simulate indoor display.

This document is applicable to all types of colour and monochrome photographic reflection prints.

This document does not include test procedures for determining the effects of light exposure on the physical stability of images, supports or binder materials.

NOTE 1 It is recognized that in some instances, physical degradation such as support embrittlement, image layer cracking, or delamination of an image layer from its support, rather than the stability of the image itself, will determine the useful life of a print material.

NOTE 2 General guidance and requirements are given in ISO 18937-1.

NOTE 3 Tables 1 and 3 of LED lamp relative spectral irradiance were created using spectra from phosphor-converted blue LED lamps. Other types of LED lamps that meet the criteria of Tables 1 and 3 are also in the scope of this document.

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 18913, *Imaging materials — Permanence — Vocabulary*

ISO 18937-1, *Imaging materials — Methods for measuring indoor light stability of photographic prints — Part 1: General guidance and requirements*

3 Terms, definitions and abbreviations

For the purposes of this document, the terms and definitions given in ISO 18913, ISO 18937-1, and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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