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Imaging materials — Reflection colour photographic prints — Method for testing humidity fastness

Matériaux pour l'image — Tirages photographiques en couleurs par réflexion — Méthode d'essai de la solidité à l'humidité

Reference number
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Foreword

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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*.

This second edition cancels and replaces the first edition (ISO 18946:2011), which has been technically revised.

The main changes are as follows:

— Low humidity test has been removed, since the low humidity test was separated from ISO 18946 and published as ISO 18949.

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

This document addresses the methods and procedures for testing the humidity fastness of reflection colour photographic prints exposed to high humidity. This is of particular relevance to dye-based ink-jet prints or dye diffusion process prints[11][12][13][14][15][16][17].

Some types of colour photographic prints suffer from changes in image appearance when exposed to a high relative humidity environment. The observed changes relate to colour, tone and loss of sharpness caused by horizontal and vertical diffusion of colorants as a result of exposure to elevated humidity.

The elevated humidity can arise from:

a) exposure to high relative humidity of the environment of the display area or storage space;

b) trapped moisture as a result of stacking prints, or inserting them into albums, in a high relative humidity environment;

c) trapped moisture as a result of stacking prints, or inserting them into albums, before sufficient dry time has elapsed.

Note For the investigation of cases b) and c), the “sealed bag” method within the thermal test ISO 18936 can be adopted.

Therefore, humidity based on meteorological data and users’ behaviour was considered in determining the appropriate test conditions for the humidity fastness test. The test method stipulated in this document is validated for case a).

Image deterioration of dye-based prints caused by high humidity is often detectable by the following characteristics.

— Blur (sharpness loss), change of colour and/or tone is observed.

— The deterioration is observed in higher humidity, commonly over 80 % RH or over 90 % RH.

— The deterioration can occur in a relatively short time, even within one or two weeks.

— Higher density images, or images that contain more secondary or mixed colours, are generally more affected. The largest change is usually observed at the boundary of different colours, or with images that have contrasting background colours. The size of the higher density area also affects the deterioration because the solvent and water of the ink diffuses to the adjacent lower density area when the higher density area is small.

It is important to take into account these characteristics when determining the appropriate test chart and test conditions.

This document makes use of a checkerboard pattern that allows assessment of humidity-induced blur by means of a relatively simple colorimetric measurement[12].

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Imaging materials — Reflection colour photographic prints — Method for testing humidity fastness

1 Scope

This document describes test methods for evaluating reflection colour photographic prints with regard to changes in image appearance resulting from exposure to high relative humidity.

NOTE Testing under low humidity conditions is described in ISO 18949.

The observed changes relate to colour, tone and loss of sharpness caused by horizontal and vertical diffusion of colorants from exposure to elevated humidity levels. Other humidity-related factors, such as mould and mildew growth, and physical damage, such as curl, cockle, cracking or delamination due to humidity cycling, are outside the scope of this test method.

Although the method and procedures described in this document can be used to test any colour hardcopy technology, it is particularly appropriate to systems where the colorants are applied by a mechanism involving the diffusion of colorant into image-receiving layers (for example inkjet or dye diffusion processes) or applied onto uncoated fibrous materials such as paper.

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/TR 18931, *Imaging materials — Recommendations for humidity measurement and control*

ISO 18941, *Imaging materials — Colour reflection prints — Test method for ozone gas fading stability*

ISO 13655, *Graphic technology — Spectral measurement and colorimetric computation for graphic arts images*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18913 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/

3.1
colour fringing
area of anomalous colour, most visible around a printed edge

Note 1 to entry: The cause is colorants that diffuse laterally at different rates. It is visually analogous to chromatic aberration effects seen in images from simple lens systems.

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