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Household electric appliances - Specification of the properties of a digital system for measuring the performance

Appareils électrodomestiques - Spécification des propriétés d'un système numérique pour les mesures d'aptitude à la fonction

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Household electric appliances - Specification of the properties of a digital system for measuring the performance

FOREWORD

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IEC 63350 has been prepared by subcommittee SC 59K: Performance of household and similar electrical cooking appliances, of IEC technical committee TC 59: Performance of household and similar electrical appliances.

This first edition cancels and replaces IEC TS 63350, published in 2022.

This edition includes the following significant technical changes with respect to IEC TS 63350:

a) Revision of 4.2: Movable items (e.g., containers, jigs, reference objects) can now be present in the assessment area provided that mitigation measures are applied and periodic verification against known reference artefacts is documented; the requirement to keep the assessment area as constant as possible is retained.
b) Addition of new supporting document: Note in 5.1 introduces the Fogra 52 profile (included in the reference colour supporting documents from the IEC SC 59K supporting documents web site) which is referencing the conditions of ISO 12647-7 [1] and ISO 12647-2 [2].
c) Four additional reference shades with hue angles > 130° are introduced in **5.3** for calibration (to enable accurate pixel-wise hue-angle measurement). These do not create new shade classes.
d) Revision of 6.2: Calculation of sampling positions remains unchanged, but the procedure changes to reflect better the actual test scenario.
e) Added reporting of input image colour channel data (7.7).

The text of this document is based on the following documents:

Draft	Report on voting
59K/429/FDIS	59K/431/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this document is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at https://www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at https://www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

This corrected version of IEC 63350:2026 incorporates the following correction:

– Addition of bibliographic reference numbers in the content

INTRODUCTION

IEC subcommittee 59K has agreed to make a collection of existing and future requirements on a digital system used in testing the performance of appliances under the scope of SC 59K, cooking appliances.

This document bundles the generic requirements given in IEC 60350-1 [3] and IEC 60350-2 [4] that are updated, aligned, and supplemented by further requirements. The reference colour system is changed from a proprietary colour system to the standardized and widely used CIELAB-based reference colour system.

The intention with this publication is to ensure that using a digital system, which complies with the stated requirements and described methods, leads to reproducible results.

Currently, this document focuses on test methods described in IEC 60350-1 [3] and IEC 60350-2 [4] but further applications based on visually detectable performance criteria can be supplemented.

1 Scope

This document specifies generic requirements for creating a digital system that is used for measuring the characteristics of visually detectable performance, such as browning intensity and lightness.

It defines the metrological requirements of this digital system and demonstrates the procedures for compliance. The digital system contains the measuring instrument, the software, and the reference materials necessary to realize the measurement process.

References to this document can be made by a customer when specifying the digital system and by the suppliers when specifying products offered.

Interested parties can agree to use this document as an input for satisfying measurement management system requirements in any activities.

NOTE 1 The principles of ISO 10012 [5] are followed to ensure the capability of the systems.

NOTE 2 Possible suppliers for the recommended digital system can be found in the supplementary file located at: https://www.iec.ch/sc59k/supportingdocuments.

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 12647-2, *Graphic technology — Process control for the production of half-tone colour separations, proof and production prints — Part 2: Offset lithographic processes*

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

CIE 15, *Colorimetry*

3 Terms and definitions

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

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

– IEC Electropedia: available at https://www.electropedia.org/
– ISO Online browsing platform: available at https://www.iso.org/obp

3.1 Terms and definitions

3.1.1
digital system
system that is used for measuring the characteristics of visually detectable performance

3.1.2
assessment area
area of the digital system within which the requirements stated in this document are met and the items under test are positioned

3.1.3
shade chart
sample representing the reference values for the colour and lightness recognition and used for calibration of the digital system

3.1.4
items under test
IUT
objects positioned in the assessment area for evaluation

EXAMPLE 1 Shortbread, small cakes, broccoli, white bread, in accordance with IEC 60350-1 [3].

EXAMPLE 2 Floured disc, in accordance with IEC 60350-2 [4].

3.2 Terms and definitions of international lighting vocabulary

L^*	CIELAB lightness
a^*, b^*	CIELAB a^*, b^* coordinates
C^*_{ab}	CIELAB chroma
h_{ab}	CIELAB hue angle
ΔL^*	CIELAB lightness difference
ΔE^*_{ab}	CIELAB colour difference
ΔE_{00}	CIEDE2000 colour difference

4 Test setup

4.1 Illumination

The measurement is taken under an illumination similar to the CIE Standard Illuminate used for the definition of the shade charts (see Clause 5).

The maximum calculated deviation of rendering the shade charts under the used light shall be $\Delta L^* \leq 1$ for a measurement system for lightness recognition, and $\Delta E_{00} \leq 5$ for a measurement system for colour recognition.

To calculate the deviation of the colour rendering, the 10° tristimulus values of the reference colours shall be calculated with the spectral distribution of the reference colours defined in the corresponding performance test for the relative spectral power distribution of CIE D65 and the relative spectral power distribution of the test setup illumination. The calculation shall be performed from 400 nm to 700 nm with a step of increment no more than 10 nm.

The spectral power distribution of the test setup illumination shall be measured along the central axis of the beam, with the sensing surface oriented normal to this axis. The spectroradiometer sensing surface is placed at a distance which ensures sufficient light for a measurement to be taken while eliminating any stray light. The light shall stabilize before measurements are carried out (e.g. stable temperature).

Spectral distribution of the reference colours for the calculation shall be acquired with a diffuse eight-degree geometry, specular component included measurement mode (di:8°) spectrometer in accordance with CIE 15.