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Plastics — Test method of exposure to white LED lamps

Plastiques — Méthode d'essai d'exposition aux lampes à LED blanches

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Foreword

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This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 6, *Ageing, chemical and environmental resistance*.

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.

Introduction

Fluorescent lamps and incandescent lamps have long been used in homes, offices, retail outlets, factory and commercial facilities. Recently, these facilities have begun changing to white LED (Light Emitting Diode) lamps. White LED lamps are now in wide use. White LED lamps emit no UV radiation, but can cause degradation of some materials. This effect is reported in “Study on conservation aspects using LED technology for museum lighting”[7] and “Study of the light stability of colour photographic reflection prints under LED lighting”[8]. Coloured and uncoloured plastics are used in many places, such as homes, offices and factories. Different plastics can experience different degradation when exposed to white LED lamps as compared to when exposed to fluorescent and incandescent lamps. Therefore, a test method to estimate a product life under white LED lamp is important. This document provides such a test method and also provides some information about the result between this test method and a test method using a xenon-arc lamp (see Annex A).

Plastics — Test method of exposure to white LED lamps

1 Scope

This document specifies a method for exposing test specimens to white light emitting diode (LED) lamps at specified temperatures and relative humidity.

This document is applicable to coloured and uncoloured plastics that are exposed to white LED lamps in indoor environments such as homes, offices, retail outlets, factory and commercial facilities that do not experience solar radiation through window glass. It can be applicable to plastics in other environments as well.

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 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance and requirements*

ISO 4892-2, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

CIE 13.3, *Method of measuring and specifying colour rendering properties of light sources*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4892-1 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/

4 Principle

Specimens to be tested are exposed to white LED lamps under controlled conditions. White LED lamps shall emit only visible radiation, excluding ultraviolet radiation. Test conditions of temperature and humidity shall be selected to simulate home or office environments.

5 Apparatus

5.1 Light source

5.1.1 General

The light source shall comprise one or more white LED lamps. Typically, a white LED lamp is used, which is a blue LED chip with phosphors. The following characteristics of the white LED lamps used shall be reported:

— correlated colour temperature, CCT;

— average colour rendering index, R_a, according to CIE 13.3;