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Paints and varnishes — Artificial weathering including acidic deposition

Peintures et vernis — Vieillissement artificiel comportant un dépôt acide

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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 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

This second edition cancels and replaces the first edition (ISO 15110:2013), which has been technically revised. The main changes compared to the previous edition are as follows:

— the scope has been restricted to paints and varnishes;

— the black panel thermometer has been added for fluorescent UV lamps, since it gives equivalent results to BST UV-F devices;

— exposure with uncontrolled humidity has been included as a new type U ADF test, since it has been shown that control of humidity does not affect type of pinpoint damage resulting from this test.

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Introduction

This document specifies a method of simulating the damaging effect of outdoor weathering with relevance to acidic atmospheric precipitation on painted products. The mechanisms differ from those of harmful gases, which essentially constitute the initial products of acidic precipitation.

Arising from changing industrial air pollution and additionally diffused by the stochastic wind and cloud distribution, acidic precipitation occurs sporadically. Thus, especially regarding acidic precipitation, outdoor weathering effects vary enormously within different years. Therefore, it is practically impossible to obtain reliable outdoor exposure results from just one season. These fluctuations can be avoided through the use of a laboratory test where all weathering parameters, including the acidic deposition, can be controlled.

The method is based on VDI Guideline VDI 3958-12[9].

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Paints and varnishes — Artificial weathering including acidic deposition

1 Scope

This document specifies a so-called acid dew and fog test (ADF test) as an accelerated laboratory test method for simulating, by the use of artificial acidic precipitation, the damaging effects of acidic atmospheric precipitation in association with UV radiation, neutral condensed precipitation, and changing temperature and humidity. This test method is intended to be used in evaluating, on the basis of relative performance rankings, the suitability of painted materials for use in outdoor environments with acidic precipitation. It is not intended to generate the same extent of damage or the same damage pattern as in outdoor weathering, but rather to give a ranking which is similar to that which would be obtained in outdoor weathering. The method produces damage which is more homogeneous, allows fewer specimens to be exposed (and hence more rapid testing) and enables evaluation of the exposed specimens to be carried out using methods which are more objective than visual assessment.

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 16474-1, *Paints and varnishes — Methods of exposure to laboratory light sources — Part 1: General guidance*

ISO 16474-2:2013, *Paints and varnishes — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 16474-3:2013, *Paints and varnishes — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

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

4 Principle

The combined action of solar UV radiation, heat, humidity, wetting and acidic deposition is simulated in weathering devices similar to those described in ISO 4892-2 and ISO 16474-2 for xenon-arc lamps and in ISO 4892-3 and ISO 16474-3 for fluorescent UV lamps.

Included in the artificial exposure is an acidic exposure, which is accomplished by a once-per-day spraying of acid. The aim of this test is not to reproduce the visual damage patterns which result from outdoor exposures, which show a very widespread distribution that is hard to evaluate. Rather, the aim is to reproduce the same ranking which would be obtained with an outdoor exposure, by causing damage by the same mechanisms but creating a homogeneous distribution on a smaller scale that can be evaluated in an objective way.

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