

**Paints and varnishes - Artificial weathering including  
acidic deposition (ISO 15110:2013)**

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## EESTI STANDARDI EESSÕNA

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ICS 87.040

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ICS 87.040

English Version

**Paints and varnishes - Artificial weathering including acidic  
deposition (ISO 15110:2013)**

Peintures et vernis - Vieillessement artificiel comportant un  
dépôt acide (ISO 15110:2013)

Beschichtungsstoffe - Künstliches Bewittern mit saurer  
Beanspruchung (ISO 15110:2013)

This European Standard was approved by CEN on 2 February 2013.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Foreword

This document (EN ISO 15110:2013) has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by September 2013.

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### Endorsement notice

The text of ISO 15110:2013 has been approved by CEN as EN ISO 15110:2013 without any modification.

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## Introduction

This International Standard specifies a method of simulating the damaging effect of outdoor weathering with relevance to acidic atmospheric precipitation on polymeric products. In addition to the classical environmental variables of temperature and humidity, acidic atmospheric precipitation can also have a significant effect on the photochemical ageing of polymers, e.g. by attacking the stabilizers. 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.[\[9\]](#)

# Paints and varnishes — Artificial weathering including acidic deposition

## 1 Scope

This International Standard 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 polymeric 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, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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*

ISO 4892-2:2006, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 4892-3:2006, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps*

## 3 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.

Accelerated weathering is achieved by the serial arrangement of the worst conceivable combinations of environmental conditions for the object under test (referred to hereafter as the “worst-case scenario”). This is accomplished by reproducing these environmental conditions in a more compressed sequence than would be the case outdoors and by including artificial acidic precipitation. However, the values of the environmental conditions used do not significantly exceed those encountered in practice outdoors.