



SLOVENSKI STANDARD
kSIST FprEN 16472:2014
01-januar-2014

Polimerni materiali - Metoda za umetno staranje z živosrebrno žarnico

Plastics - Method for artificial accelerated photoageing using medium pressure mercury vapour lamps

Kunststoffe - Verfahren zur künstlich beschleunigten Alterung bei Verwendung von Quecksilberdampflampen

Plastiques - Méthode de photovieillissement artificiel accéléré utilisant des lampes à vapeur de mercure à moyenne pression

Ta slovenski standard je istoveten z: FprEN 16472

ICS:

83.080.01	Polimerni materiali na splošno	Plastics in general
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kSIST FprEN 16472:2014	en,fr,de
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

FINAL DRAFT
FprEN 16472

November 2013

ICS 83.080.01

English Version

Plastics - Method for artificial accelerated photoageing using medium pressure mercury vapour lamps

Plastiques - Méthode de photovieillissement artificiel
accélééré utilisant des lampes à vapeur de mercure à
moyenne pression

Kunststoffe - Verfahren zur künstlich beschleunigten
Alterung bei Verwendung von Quecksilberdampf lampen

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (FprEN 16472:2013) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by NBN.

This document is currently submitted to the Formal Vote.

Introduction

When a polymeric material is exposed to natural UV radiation and other moderate environmental stresses, the change in most physical properties is attributable to chemical ageing, and the extent of the chemical changes can be related to the duration of the exposure under natural outdoor weathering conditions.

This method attempts to maximize the acceleration of photoageing using elevated UV irradiance and temperature that still keep the fundamental photoageing mechanism equivalent to that found in natural ageing. Temperature increase above the natural level should be limited so that the photothermal transformation exceeds any pure thermal conversion. A medium pressure mercury lamp, with radiations of wavelength lower than 290 nm properly filtered out, gives a relevant source with high UV emission intensity and low IR emission.

One of the main interests in use of artificial accelerated photoageing tests is to be able to provide a relevant lifetime estimate of polymeric materials exposed in natural outdoor conditions.

The relevance of artificial ageing can be determined by comparing the chemical changes that occur in the accelerated test to those that occur in natural weathering (see ISO 10640). Kinetic analysis is recommended to determine the rate of degradation under different conditions of ageing in order to rank different formulations or to determine the range of acceleration possible for an artificial ageing test compared to a given natural outdoor weathering exposure (without distortion of the photodegradation mechanism of the polymer).

Chemical changes control the degradation of mechanical properties and contribute to changes in the visual appearance of polymer materials during photoageing. These chemical changes may be analysed primarily by IR spectroscopy, with additional analyses using UV/visible spectroscopy during the photoageing of polymers.