SLOVENSKI STANDARD
SIST EN 15457:2022

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Nadomešča:
SIST EN 15457:2014

Barve in laki - Laboratorijske metode za preskušanje učinkovitosti konzervansov filma v premazih proti glivam

Paints and varnishes - Laboratory method for testing the efficacy of film preservatives in a coating against fungi

Beschichtungsstoffe - Laborverfahren für die Prüfung der Wirksamkeit von Filmkonservierungsmitteln in einer Beschichtung gegen Pilze

Peintures et vernis - Méthode d'essai en laboratoire permettant de déterminer l'efficacité des préservateurs du feuil d'un revêtement contre les champignons

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English Version

Paints and varnishes - Laboratory method for testing the efficacy of film preservatives in a coating against fungi

Peintures et vernis - Méthode d'essai en laboratoire permettant de déterminer l'efficacité des préservateurs du feuil d'un revêtement contre les champignons

Beschichtungsstoffe - Laborverfahren für die Prüfung der Wirksamkeit von Filmkonservierungsmitteln in einer Beschichtung gegen Pilze

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

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European foreword

This document (EN 15457:2022) has been prepared by 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of an identical text or by endorsement, at the latest by September 2022, and conflicting national standards shall be withdrawn at the latest by September 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15457:2014.

The main changes compared to EN 15457:2014 are as follows:

a) new terms and definitions have been added;

b) the use of terms and definitions throughout the document has been corrected;

c) the procedure in 8.4 has been corrected: the suspension is spread out onto the test specimen;

d) Figure A.1 has been corrected in accordance with corrected procedure in 8.4;

e) the document has been editorially revised and the normative references have been updated.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document identifies criteria to assess efficacy of film preservatives in a coating against fungi. The results of the method allow evaluation of an active substance with regard to its inclusion in Annex I of the Biocidal Product Regulation 528/2012 (Regulation EU No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the placing of biocidal products on the market – BPR).

The characteristics of the biocide treated coating material should conform to national regulations with regard to health, safety and the environment.

1 Scope

This document specifies a laboratory test method for determining the biocidal or biostatic efficacy of single active substances or combinations thereof used in film preservatives of coatings against fungal growth. This document does not apply to coatings unsusceptible to fungal growth. The test method covers only active substances for film preservation. It does not indicate the efficacy of the coating film to protect itself or an underlying material. The test method is applicable for active substances used for the protection of wood and masonry coatings. It is not applicable to marine coatings.

Safety, health and environmental aspects are not in the scope of this document.

Determination of the performance of film preservatives in coatings by applying ageing procedures is not within the scope of this document.

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.

EN 12469, *Biotechnology - Performance criteria for microbiological safety cabinets*

EN 16492:2014, *Paints and varnishes - Evaluation of the surface disfigurement caused by fungi and algae on coatings*

EN 23270, *Paints and varnishes and their raw materials - Temperatures and humidities for conditioning and testing (ISO 3270)*

EN ISO 1513, *Paints and varnishes - Examination and preparation of test samples (ISO 1513)*

EN ISO 15528, *Paints, varnishes and raw materials for paints and varnishes - Sampling (ISO 15528)*

3 Terms and definitions

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

ISO and IEC maintain terminological 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
active substance
substance or micro-organism that has an action on or against harmful organisms

[SOURCE: Biocidal Product Regulation (BPR, Regulation (EU) 528/2012), Article 3.1 (c), modified – the article “a” between “or” and “micro-organism” was deleted]

3.2
sample
portion of coating material to be tested

3.3
test sample
strip of filter paper without biocidal effect covered with the coating material to be tested

Note 1 to entry: See also Figure A.1.

3.4
test specimen
punched-out portion of a test sample

Note 1 to entry: See also Figure A.1.

4 Principle

To determine the fungicidal efficacy of film preservatives in a coating, the coating material is applied to a substrate conditioned according to EN 23270, placed onto an agar surface, inoculated with a standard fungal spore suspension and incubated. Conclusions can be drawn about the fungicidal efficacy of the film preservatives in a coating from the intensity of the fungal growth on the surface of the test specimen after incubation. The method described here is a semiquantitative, comparative method between coatings, with and without film preservatives.

5 Apparatus and materials

5.1 Cutting device for preparing the test specimens (coated filter paper with a diameter of 55 mm).

5.2 Autoclave.

5.3 Incubator capable of maintaining (24 ± 2) °C.

5.4 Pipette, in the range between 100 µl to 1 000 µl, with sterile tips or combi-tips of 12,5 ml.

5.5 Filter paper without fungicidal effect (e.g. cellulose with a pore size of 0,45 µm and a thickness of 650 µm).

5.6 If applicable, automatic welding apparatus to seal the bags.

5.7 Sterilized glass bottles (100 ml).

5.8 Laboratory balance, capable of weighing to an accuracy of 0,1 g.

5.9 Microscope.

5.10 Device to determine cell count (commercially available counting chamber, e.g. Thoma chamber).

5.11 Wetting agent (e.g. N-methyltaurine, sodium lauryl sulfate).

5.12 Device for applying the coating.

5.13 Sterilized test tubes or **other sterilized glassware** for preparing slant agar cultures.

5.14 Sterile Drigalski spatula or disposable spreader.

5.15 Sterile platinum loop or disposable loops.

5.16 Sterile glass funnel with cotton wool or rockwool.

5.17 Sterile Petri dishes (with a diameter of 94 mm, and a height of 16 mm).

5.18 Sterile tweezers.

5.19 Sterile water.

5.20 Malt extract agar.

5.21 Class 2 microbiological safety cabinet according to EN 12469.

6 Fungi

6.1 Fungi more likely to grow in an exterior environment

a) Aureobasidium pullulans (DSM[1] 2404)

b) Alternaria alternata (DSM 62010)

c) Cladosporium cladosporioides (DSM 62121)

d) Phoma violaceae (IMI[2] 49948ii)

e) Ulocladium atrum (IMI 79906 or DSMZ 63068)

6.2 Fungi more likely to grow in an interior environment

a) Aspergillus versicolor (DSM 1943)

b) Aspergillus niger (DSM 12634)

c) Stachybotrys chartarum (DSMZ 2144)

d) Penicillium purpurogenum (DSM 62866)

e) Rhodotorula mucilaginosa (DSM 70825)

The spore suspension used for the test shall be a mixture containing two fungi selected from the first group (6.1) and two fungi selected from the second group (6.2).

7 Sampling and preparation of test samples and of test specimens

7.1 Sampling

Take a representative sample of the coating material or of the coating system for testing in accordance with EN ISO 15528 and examine and prepare it in accordance with EN ISO 1513.

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[1] DSM = DSMZ = Deutsche Sammlung für Mikroorganismen und Zellkulturen (German collection of micro-organisms and cell cultures), Braunschweig, Germany.

[2] IMI = CABI = Bioscience Genetic Resource Collection, Egham, UK.

7.2 Preparation of test samples (see Annex A)

Coat a strip of filter paper without biocidal effect with the coating material to be tested. The application rate recommended by the coating manufacturer for normal use should be applied.

7.3 Conditioning of the test samples

Condition the test sample in a horizontal position for at least 5 days at (23 ± 2) °C and (50 ± 5) % relative humidity, in accordance with EN 23270.

NOTE The conditioning time might vary according to the coating material and end use corresponding to information given by the manufacturer.

7.4 Preparation and number of test specimens

After conditioning, three test specimens each with a diameter of 55 mm shall be prepared from the test samples. The test specimens shall be sealed in a plastic or paper bag and sterilized using gamma radiation of ≥ 10 kGy. Other methods of sterilization may be agreed between the parties.

For each test series three test specimens covered with coating material containing the film preservative, three test specimens covered with the same coating material without film preservative and three test specimens of the uncoated substrate shall be tested.

8 Procedure

8.1 Preparation of the Petri dishes with the culture medium

A malt extract (3 %)-agar(1,5 %)-medium shall be sterilized in the autoclave. After cooling the medium to 55 °C to 60 °C, 20 ml shall be poured into each sterile Petri dish under aseptic conditions.

8.2 Preparation of stock cultures and sub-cultures

Sub-cultures shall be obtained by inoculating spore material from a stock culture to freshly prepared malt extract agar slope culture media and should be used for preparing the spore suspension. From these sub-cultures further sub-cultures can be derived in sufficient number. After the inoculation the sub-cultures shall be incubated at (24 ± 2) °C until good sporulation has been achieved. This might require 3 days to 14 days, depending on the fungal species used for testing. The sub-cultures can be stored satisfactorily at 3 °C to 7 °C for a period of 3 months.

NOTE The sub-culturing can also be performed by spreading out the culture on MEA media in petri dishes. The spores are harvested by adding physiological salt containing wetting agent and scraping the spores using an appropriate sterile tool.

8.3 Preparation of the spore suspension

For preparing the spore suspension a well-sporulating sub-culture is used. To this sub-culture 5 ml of sterile deionized water should be added (if required also add a surfactant – e.g. 0,1 % N-methyltaurine). The spores shall be washed down from the malt extract agar slope, using a platinum loop as an aid, filtered through a sterile glass funnel with cotton wool and collected in a sterile glass bottle.

After counting the spore concentration by using a commercially available counting chamber and diluting each with sterile water to 10^6 to 10^7 spores/ml all spore suspensions intended for testing shall be mixed in equal parts.