SLOVENSKI STANDARD
SIST EN 15458:2014

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Nadomešča:
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Barve in laki - Laboratorijske metode za preskušanje učinkovitosti konzervansov filma v premazih proti algam

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

Beschichtungsstoffe - Laborverfahren für die Prüfung der Wirksamkeit von Filmkonservierungsmitteln in einem Beschichtungstoff gegen Algen

Peinture et vernis - Méthode d'essai en laboratoire permettant de vérifier l'efficacité des préservateurs du feuil d'un revêtement contre les algues

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

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

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

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Foreword

This document (EN 15458:2014) 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of an identical text or by endorsement, at the latest by February 2015 and conflicting national standards shall be withdrawn at the latest by February 2015.

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Introduction

This document identifies criteria to assess the efficacy of film preservatives in a coating against algae. The results of the method allow evaluation of an active substance with regard to its inclusion in Annex I of the Biocidal Products Directive 98/8/EC (Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market – BPD) or in the list of the Biocidal Product Regulation (BPR, Regulation (EU) 528/2012).

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

1 Scope

This European Standard specifies a laboratory test method for determining the biocidal/biostatic efficacy of single active substances or combinations thereof used in film preservatives in a coating against algal growth. The standard does not apply to coatings not susceptible to algal growth. The test method comprises only active substances for film preservation, not the protection of the substrate itself, e.g. wood, which is dealt with in another standard. The test method is applicable for active substances used for wood and masonry coatings. It is not applicable to marine coatings.

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

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

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.

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

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)*

3 Terms and definitions

For the purposes of this document, the following term and definition applies.

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]

4 Principle

For the determination of the algicidal 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 algal suspension and incubated over a certain period of time under conditions appropriate for algal growth. Conclusions can be drawn with regard to the algicidal efficacy of the film preservatives in a coating from the intensity of the algal growth on the coated surface of the specimen after incubation. The method described in this standard is a semiquantitative, comparative method between coatings with and without film preservatives.

5 Apparatus and materials

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

5.2 **Autoclave** for sterilization.

5.3 **Incubator,** capable of maintaining (23 ± 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 biocidal effect** (e.g. cellulose with a pore size of 0,45 µm and a thickness of 650 µm).

5.6 Automatic welding apparatus to seal the bags.

5.7 Sterilized glass bottles (100 ml, 0,5 l, 1 l).

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

5.9 Bold modified Basal medium as specified in the method (see 8.1).

5.10 Stock solution (see 8.2).

5.11 Culture flask with cap (0,5 l or 1 l).

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

5.13 Microscope

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

5.15 Device for applying the coating

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

5.17 Sterile tweezers

5.18 Sterile water

5.19 Class 1 microbiological safety cabinet according to EN 12469.

5.20 Luxmeter

5.21 Cold white or **daylight lamp**

6 Microorganisms

— Blue-green algae *Nostoc commune* SAG[1)] 1453-3;

— Blue-green algae *Gloeocapsa atrata* Kützing (syn. *Anacystis montana*) CCAP[2)] 1430/1;

— Green algae *Klebsormidium flaccidum* SAG 335-5*;*

— Green algae *Stichococcus bacillaris* SAG 379-1a = CCAP 379/1A.

From these four microorganisms one blue-green and one green algae are selected.

7 Sampling and preparation of test samples and of specimens

7.1 Sampling

Take a representative sample of the coating material or coating system for testing in accordance with EN ISO 1513.

7.2 Preparation of test samples (see Annex A)

1) SAG = (Sammlung von Algenkulturen (Culture Collection of Algae), Göttingen; available at: Georg-August Universität Göttingen, Germany.

2) CCAP = Culture Collection of Algae and Protozoa; SAMS Research Services Ltd, Scottish Marine institute Oban, Scotland, UK.

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

7.3 Conditioning of the test samples

Condition the test samples 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 specimens

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

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

8 Procedure

8.1 Preparation of Bold's Basal Medium [3)]

For the algal nutritive solution the following substances are required:

a) 10 ml each of stock solutions a) to f) in 8.2;

b) 1 ml each of trace element stock solutions g) to j) in 8.2;

c) 940 ml demineralized or distilled water;

d) 15 g agar (only for the solid nutritive medium).

The solution shall be sterilized in the autoclave. For the test both solid (with 1,5 % agar) and also liquid nutritive medium are required.

8.2 Preparation of the stock solutions

Stock solutions:

a)	$NaNO_3$	10,0 g	Distilled water	400 ml
b)	$CaCl_2 \cdot 2H_2O$	1,0 g	Distilled water	400 ml
c)	$MgSO_4 \cdot 7H_2O$	3,0 g	Distilled water	400 ml
d)	K_2HPO_4	3,0 g	Distilled water	400 ml
e)	KH_2PO_4	7,0 g	Distilled water	400 ml
f)	NaCl	1,0 g	Distilled water	400 ml

Trace element stock solutions:

g)	Ethylenediaminetetraacetic acid	50 g		
	KOH	31 g	Distilled water	1 000 ml
h)	$FeSO_4 \cdot 7H_2O$	4,98 g	Distilled water (acidified)	1 000 ml

3) Bischoff, H. W. & Bold, H. C. (1963): Phycological Studies. IV. Some soil algae from Enchanted Rock and related algal species. – Univ. Texas Publ. 6318: p. 1-95