SLOVENSKI STANDARD
oSIST prEN 16105:2010

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Barve in laki - Spiranje snovi iz premazov - Laboratorijska metoda potapljanja

Paints and varnishes - Leaching of substances from coatings - Laboratory immersion method

Lacke und Anstrichstoffe - Auswaschung von Substanzen aus Beschichtungen - Labortauchverfahren

Peintures et vernis - Lixiviation de substances à partir de revêtements - Méthode d'immersion en laboratoire

Ta slovenski standard je istoveten z: **prEN 16105**

ICS:

87.040	Barve in laki	Paints and varnishes

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English Version

Paints and varnishes - Leaching of substances from coatings - Laboratory immersion method

Peintures et vernis - Lixiviation de substances à partir de revêtements - Méthode d'immersion en laboratoire

Lacke und Anstrichstoffe - Auswaschung von Substanzen aus Beschichtungen - Labortauchverfahren

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN 16105:2010) has been prepared by Technical Committee CEN/TC 139 “Paints and varnishes”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

Introduction

Leaching of substances from coatings into water needs to be quantified to enable an environmental risk assessment for the use of substances in coatings. Substances may be leached from coatings particularly by driving rain and transported to the environment.

1 Scope

This document specifies a laboratory method to determine the leaching behaviour of substances from coatings to water over defined time intervals.

The release of substances from coatings under natural conditions cannot be determined with this method.

2 Normative references

The following referenced documents are indispensable for the application 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 1062-1:2004, *Paints and varnishes — Coating materials and coating systems for exterior masonry and concrete — Part 1: Classification*

EN 23270, *Paints and varnishes and their raw materials — Temperatures and humidities for conditioning and testing (ISO 3270:1984)*

EN ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling (ISO 15528:2000)*

EN ISO 10993-9:2009, *Biological evaluation of medical devices — Part 9: Framework for identification and quantification of potential degradation products*

CEN/TC 351/WG 1 TS-2, *Generic horizontal dynamic surface leaching test (DSLT) for determination of surface dependent release of substances from construction products*

CEN/TC 351/WG 1 TG-4:2009, *Construction products — Assessment of release of dangerous substances — Complement to sampling*

3 Terms and definitions

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

3.1
substance
single chemical element or compound, or a complex structure of compounds, that is contained in the coating and can potentially be extracted from the coating via water contact

[EN ISO 10993-9:2009]

3.2
target substance
for each leaching test one or more specific target substances have to be defined, which shall be quantified in the eluates and for which results shall be given according to Clause 6

EXAMPLE Biocides can be the target substances (see Annex B).

3.3
biocide
active substance evaluated with regard to its inclusion in Annex A 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)

3.4
coating
product, in liquid or in paste or powder form, consisting of a mix of one or more binders, aggregates, additives/additions, when applied to a substrate, forms a film possessing protective, decorative and/or other specific properties

[EN 1062-1:2004]

3.5
emission
release of substances from a material (e.g. coating), which pass through the external surface of the material under specific conditions into the environment

NOTE The emission is expressed in units of released mass per surface area, i.e. milligrams per square metre.

3.6
leaching
release of substances from a material (e.g. coating), which pass through the external surface of the material under specific conditions into water

NOTE The leaching is expressed in units of released mass per surface area, i.e. milligrams per square metre.

3.7
immersion
exposure of test specimen to the leachant

3.8
immersion day
immersion cycle consisting of 1 h immersion, 4 h drying and 1 h immersion, abbreviated with d_i

3.9
eluate
solution obtained by a laboratory leaching test

3.10
specific emission rate
SER
released mass of a target substance from a coating through the surface in a specific time interval

NOTE 1 The unit is the mass per surface area per time unit, i.e. milligramme per squaremeter and day.

NOTE 2 The time unit here corresponds to immersion days with no direct relation to SI-time units.

3.11
leachant
liquid that is brought into contact with the test portion in the leaching procedure

NOTE Standard leachant as specified in 4.1.

4 Reagents

4.1 Standard leachant.

Deionised water with a pH-value of (6 ± 1) and a water temperature of (23 ± 2) °C shall be used.

5 Apparatus

5.1 General

Check the materials and equipment specified in 5.2.1 to 5.2.6 before use for proper operation and absence of interfering elements that may affect the results of the test.

The equipment specified in 5.2.2 to 5.2.5 shall also be calibrated.

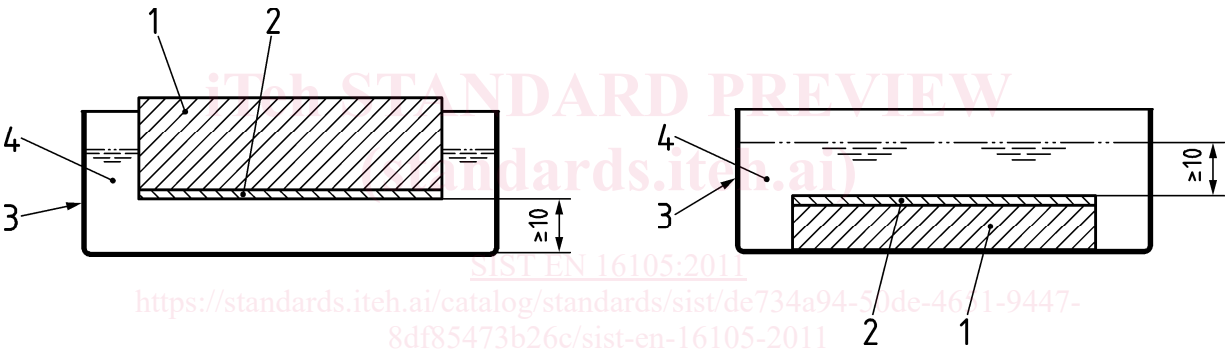
5.2 Equipment

5.2.1 Immersion container

The container for immersion shall be made of a material inert to the target substances of interest in the eluates (e.g. glass, PTFE coated). The immersion container shall be large enough to allow the test specimens to have the coated face completely exposed to water and contain 25 l water per squaremeter exposed face. The water column above or below the test surface shall be ± 10 mm.

NOTE For example, a test specimen of 100 cm² requires 250 ml water.

Dimensions in millimetres



a) **b)**

Key
1 substrate
2 coating
3 immersion container
4 leachant

Figure 1 — Possible orientations of the test specimen in the immersion container during the immersion process

5.2.2 Analytical balance

Analytical balance, with an accuracy of ± 0,1 g.

5.2.3 Device for measuring

Device for measuring sample dimensions, with an accuracy of ± 1 mm.

5.2.4 Measuring cylinders for volume determination

Measuring cylinders for volume determination, with 1 % accuracy.

5.2.5 pH meter

pH meter, with an accuracy of ± 0,05.

5.2.6 Glass or plastic bottles

Glass or plastic bottles, e.g. glass, HDPE, PMMA, PTFE, PE, PET, PP, PVC.

Use bottles with an appropriate volume, and with screw cap, for eluate collection and preservation of eluate samples.

6 Test procedure

6.1 General considerations

Coatings are exposed under natural weather conditions to intermittent cycles of wetting (rainfall, thaw, condensate) and drying. To assess the leaching of substances from coatings, a wetting and drying method is described in this document. For this purpose, samples with coatings are immersed into water and dried in time intervals.

The water from each immersion day is analysed to determine the concentration of leached target substances.

NOTE The intensity, the duration, the temperature and pH-value of rainfall are important for the quantity and quality of emissions from coatings under natural weather conditions.

6.2 Sample preparation

6.2.1 Substrate

The substrate used to carry the coating shall have a homogeneous planar surface, shall be inert and coatings shall adhere well on them during the immersion in water. As the substrate can influence the results it has to be stated in the test report.

NOTE Inert substrates can be e.g. XPS, EPS. Other substrates may influence the leaching (e.g. concrete, mineral renders and fibre cement board and wood substrates).

6.2.2 Sampling

Take a representative sample of the coating, as described in EN ISO 15528 and in accordance with CEN/TC 351/WG1 TS-2 and CEN/TC 351/WG 1 TG-4:2009.

The sampling and conditioning procedure should be recorded via a sampling report according to CEN/TC 351/WG1 TG-4, F.2.

6.2.3 Number and size of test specimens

A test specimen consists of a substrate with a coating. The tests shall be performed with at least two replicate test specimens containing target substances and with one control test specimen with the same coating, but without target substances. If the coating without target substances is not available only the substrate can be used as control test specimen.

The control test can be stopped if no background signal has been determined after the second immersion day.

Test specimens shall have a minimum surface area of 100 cm². Each test specimen shall be marked to identify it throughout the test.