

Paints and varnishes - Assessment of emissions of substances from coatings into indoor air - Sampling, conditioning and testing

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 16402:2019 sisaldab Euroopa standardi EN 16402:2019 ingliskeelset teksti.	This Estonian standard EVS-EN 16402:2019 consists of the English text of the European standard EN 16402:2019.
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English Version

Paints and varnishes - Assessment of emissions of
substances from coatings into indoor air - Sampling,
conditioning and testing

Peintures et vernis - Évaluation des émissions de
substances émanant des revêtements dans l'air
intérieur - Échantillonnage, conditionnement et essais

Beschichtungsstoffe - Bestimmung der Emissionen
regulierter gefährlicher Stoffe von Beschichtungen in
die Innenraumluft - Probenahme, Probenvorbereitung
und Prüfung

This European Standard was approved by CEN on 14 December 2018.

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European foreword

This document (EN 16402:2019) 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of an identical text or by endorsement, at the latest by August 2019, and conflicting national standards shall be withdrawn at the latest by August 2019.

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 16402:2013.

The main changes compared to the previous version are as follows:

- alignment with horizontal standard EN 16516:2017 (especially Clauses 10 to 14);
- terms and definitions updated;
- new product category “Reactive coatings for fire protection of metallic substrates” added;
- new Clause 7.1 “Intended conditions of use and emission scenario” added;
- new Clause 7.2 “Reference room and emission scenario” added;
- Clause 9.2 “Preparation of test specimen: Coatings” revised;
- new Table 4 “Preconditioning of Reactive coatings for fire protection of metallic substrates” added;
- new informative Annex A “Repeatability and reproducibility” added;
- annex on simplified, screening, secondary, derived or alternative methods revised;
- standard editorially revised.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document aligns with the horizontal method (see EN 16516:2017) for emission testing of construction products (developed in according to the Mandate M/366) and specifies the product specific details for architectural coatings (and their relevant product categories) and reactive coatings for fire protection of metallic substrates, as described in Clause 5. Clauses 10 to 12, 13.6, Clause 14, Annexes B, and D to H are adopted from EN 16516:2017 without modifications.

Architectural/decorative coatings are not included in the Construction Products Regulation (CPR).

The determination of emission into indoor air is to be made under the conditions of use during the service life. The determination of emissions specified in this document is associated with an emission scenario which specifies the climate and ventilation conditions of the air surrounding the product in a reference room. It is not applicable for the determination of emissions during the application.

A reference room is needed since it is not possible to evaluate emissions by testing in all possible use situations. The reference room dimensions and the resulting loading factors, the climate and ventilation conditions are the reference representing the general indoor air conditions. Based on the huge amount of available European experience, it was possible to identify one emission scenario and one reference room including a set of loading factors to be used.

This method is using a test chamber in which emissions are generated under conditions maintained constant during the test. These conditions are selected so that the results could be expressed either as emission rates or converted to concentrations in the reference room by calculations within the ranges where such calculations are valid.

This document also addresses separately (see Clause 14 and informative Annex B) the simplified test methods, indirect test methods, secondary/alternative test methods that provide within their specific field of application a result comparable or correlated to the result of the reference method. Such methods can be easier to apply and/or cheaper. They can be used especially for Factory Production Control testing (FPC).

The aim of this document is not to develop a new testing method but to combine by normative references the use of existing standards complemented, when necessary, with additional and/or modified requirements so that architectural coatings for fire protection or metallic substrates can be evaluated under comparable conditions with regard to emission into indoor air.

In particular, the horizontal test methods for emission testing of construction products (see EN 16516:2017) as developed regarding to Mandate M/366 have been considered and will be taken into account for further revisions of this document to ensure that comparable methods are applied for construction products as defined in Mandate M/366 and coatings covered by the horizontal standard EN 16516:2017.

1 Scope

This document specifies a reference method for the determination of emissions from coatings into indoor air. This method is applicable to volatile organic compounds, semi-volatile organic compounds and volatile aldehydes.

NOTE 1 This document is aimed at describing the overall procedure and makes use of existing standards mainly by normative reference complemented when necessary with additional or modified normative requirements.

This document is mainly aimed at determining emission data in indoor air for the purpose of meeting national legislation requirements, and for the voluntary labelling of products.

NOTE 2 Harmonized product standards for coatings falling under the CPR can refer to this standard for the intended conditions of use.

This document applies to coatings for indoor use as listed in Clause 5.

It is not applicable for:

- coatings that are applied off site or coatings that are applied on site, prior to the structure being permanently weatherproof except for the product type category 7 as listed in Clause 5;
- tinting pastes that are not ready for use as coating;
- non film-forming products like e.g. waxes and impregnations.

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 13300, *Paints and varnishes — Water-borne coating materials and coating systems for interior walls and ceilings — Classification*

EN 15824, *Specifications for external renders and internal plasters based on organic binders*

EN 16623, *Paints and varnishes — Reactive coatings for fire protection of metallic substrates — Definitions, requirements, characteristics and marking*

EN ISO 13137, *Workplace atmospheres — Pumps for personal sampling of chemical and biological agents — Requirements and test methods (ISO 13137)*

EN ISO 16000-9:2006, *Indoor air — Part 9: Determination of the emission of volatile organic compounds from building products and furnishing — Emission test chamber method (ISO 16000-9:2006)*

EN ISO 16000-11:2006, *Indoor air — Part 11: Determination of the emission of volatile organic compounds from building products and furnishing — Sampling, storage of samples and preparation of test specimens (ISO 16000-11:2006)*

EN ISO 16017-1, *Indoor, ambient and workplace air — Sampling and analysis of volatile organic compounds by sorbent tube/thermal desorption/capillary gas chromatography — Part 1: Pumped sampling (ISO 16017-1)*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*

ISO 16000-3, *Indoor air — Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air — Active sampling method*

ISO 16000-6, *Indoor air — Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MS-FID*

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 <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 Terms relating to sampling and product

3.1.1

sampling plan

predetermined procedure for the selection, withdrawal, preservation and transportation of product samples

[SOURCE: CEN/TR 16220:2011, 2.3]

3.1.2

sample

representative portion of product or material selected from a larger quantity of product or material

Note 1 to entry: The term “sample” is often accompanied by a prefix (e.g. laboratory sample, test sample, test specimen) specifying the type of sample and/or the specific step in the sampling process to which the obtained material relates.

[SOURCE: IUPAC:1990, 2.1.1, modified — Note 1 to entry was added]

3.1.3

laboratory sample

sample or sub-sample(s) sent to or received by the laboratory

Note 1 to entry: The laboratory sample is the final sample from the point of view of sample collection but it is the initial sample from the point of view of the laboratory.

Note 2 to entry: When the laboratory sample is further prepared by mixing, drying, grinding or by combinations of these operations, the result is the test sample. When no preparation of the laboratory sample is required, the laboratory sample is the test sample. A test portion is removed from the test sample for the performance of the test/analysis or for the preparation of a test specimen.

[SOURCE: IUPAC:1990, 2.5.5, modified — Notes 1 and 2 to entry were added]

3.1.4

curing

hardening of freshly prepared mixtures under well-defined conditions (time, temperature, humidity, etc.)