



NSAI
Standards

Irish Standard
I.S. EN 16402:2013

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

I.S. EN 16402:2013

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWIFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces:

This document is based on:
EN 16402:2013

Published:
30 October, 2013

This document was published under the authority of the NSAI and comes into effect on:
30 October, 2013

ICS number:

13.040.20
87.040

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

ICS 13.040.20; 87.040

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 24 August 2013.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
3.1 Terms relating to sampling and product.....	7
3.2 Terms relating to emissions into indoor air and associated laboratory testing.....	7
3.3 Terms relating to determination of emitted substances.....	10
4 Principle.....	12
5 Product categories	12
6 Relevant substances emitted from coatings	13
7 Emission scenarios and reference room	14
7.1 Dimensions and loading factors of the reference room	14
7.2 Ventilation in the reference room.....	15
7.3 Climate conditions of the reference room	15
7.4 Time schedule of emission determination	15
8 Product sampling and transport	16
8.1 Population of the product to be considered for testing	16
8.2 Sampling.....	16
8.3 Transport	17
8.4 Chain of custody.....	17
8.5 Dispatch of samples, time schedule.....	17
9 Handling of product samples in the laboratory.....	18
9.1 Storage.....	18
9.2 Preparation of test specimen: Coatings.....	18
9.3 Preparation of test specimen: Coating systems	22
9.4 Preconditioning.....	22
10 Test chamber conditions	22
11 Determination of vapour-phase organic compounds in test chamber air.....	24
11.1 Common requirements	24
11.2 Determination of VOCs and SVOCs in test chamber air	24
11.3 Determination of formaldehyde and some other volatile carbonyl compounds in test chamber air.....	27
11.4 Quality control – External references	28
12 Calculation of specific emission rates and expression of results at the reference room	28
13 Test report	31
13.1 General.....	31
13.2 Sampling.....	31
13.3 Handling of samples in the laboratory, preparation of test specimen	31
13.4 Test chamber conditions	31
13.5 Determination of vapour-phase organic compounds in test chamber air.....	31
13.6 Calculation of specific emission rates and expression of results in terms of air concentration in the reference room	32

14	'Indirect' methods	32
14.1	General	32
14.2	Requirements	32
14.3	Examples of indirect methods	33
Annex A	(informative) Examples of simplified/secondary methods	34
A.1	General	34
A.2	Indirect methods relative to testing devices	34
A.2.1	Emission cell	34
A.2.2	Microchamber	34
A.3	indirect methods relative to analysis	34
A.3.1	Thermal extraction	34
A.3.2	Headspace / gas chromatography and in-can VOC determination	34
A.3.3	Formaldehyde specific methods	34
A.4	indirect methods relative to the evaluation of the test result	35
A.4.1	Content determination	35
A.4.2	Method integrated in production monitoring	35
A.4.3	Prediction of results at 28 days	35
Annex B	(informative) Information on very volatile organic compound (VVOC) testing	36
Annex C	(informative) Example form for a chain of custody report	37
Annex D	(informative) Benzene artefact generation on Tenax TA	38
Annex E	(informative) Example of a form for the sampling report	39
Annex F	(informative) Overview of test procedure	40
	Bibliography	41

Foreword

This document (EN 16402:2013) 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 April 2014, and conflicting national standards shall be withdrawn at the latest by April 2014.

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

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard refers to the horizontal method (see CEN/TS 16516) for emission testing of construction products (developed in accordance with the Mandate M/366) and specifies the product specific details for architectural coatings and the product categories described in Clause 5.

The Construction Products Regulation (CPR) covers only coatings that are of influence to the construction and does not include architectural coatings.

Both CPR covered coatings and architectural coatings not covered by CPR may be tested according to this European Standard.

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 European Standard 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 European Standard also addresses separately (see Clause 14 and informative Annex A) 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 European Standard 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 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 CEN/TS 16516) as developed regarding to Mandate M/366 have been considered and will be taken into account for further revisions of this European Standard to ensure that comparable methods are applied for construction products as defined in Mandate M/366 and coatings covered by this European Standard.

1 Scope

This European Standard 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 This European Standard 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 European Standard applies to coatings for indoor use as listed in Clause 5. It is not applicable to coatings that are applied off site or coatings that are applied on site, prior to the structure being permanently weatherproof. It is not applicable for tinting pastes that are not ready for use as coating.

It is mainly aimed at determining emission data in indoor air for the purpose of voluntary labelling of products but may also be used for CE marking and associated Attestation of Conformity in the case of products that are covered by the Construction Products Regulation.

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 1232, *Workplace atmospheres - Pumps for personal sampling of chemical agents - Requirements and test methods*

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 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 16000-3:2011, *Indoor air — Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air — Active sampling method*

ISO 16000-6:2011, *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*

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-