



SLOVENSKI STANDARD
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Notranji zrak - 24. del: Zmogljivostni preskus za vrednotenje zmanjšanja koncentracije hlapnih organskih spojin z vpojnimi stavbnimi gradbenimi materiali

Indoor air - Part 24: Performance test for evaluating the reduction of volatile organic compound concentrations by sorptive building materials

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Air intérieur - Partie 24: Essai de performance pour l'évaluation de la réduction des concentrations en composés organiques volatils par des matériaux de construction sorptifs <https://standards.iteh.ai/catalog/standards/sist/6615ec11-cf96-42b4-b673-3bca043784fa/sist-iso-16000-24-2019>

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Indoor air —

Part 24:

Performance test for evaluating the reduction of volatile organic compound concentrations by sorptive building materials

*Air intérieur —**Partie 24: Essai de performance pour l'évaluation de la réduction des concentrations en composés organiques volatils (sauf formaldéhyde) par des matériaux de construction sorptifs*

ICS: 13.040.20

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 146/SC 6 "Indoor air".

This second edition cancels and replaces the first edition (2009), clauses of which have been technically revised.

ISO 16000 consists of the following parts:

- Part 1: General aspects of sampling strategy
- Part 2: Sampling strategy for formaldehyde
- Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air — Active sampling method
- Part 4: Determination of formaldehyde — Diffusive sampling method
- Part 5: Sampling strategy for volatile organic compounds (VOCs)
- 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
- Part 7: Sampling strategy for determination of airborne asbestos fibre concentrations
- Part 8: Determination of local mean ages of air in buildings for characterizing ventilation conditions
- Part 9: Determination of the emission of volatile organic compounds from building products and furnishing — Emission test chamber method
- Part 10: Determination of the emission of volatile organic compounds from building products and furnishing — Emission test cell method
- Part 11: Determination of the emission of volatile organic compounds from building products and furnishing — Sampling, storage of samples and preparation of test specimens

- Part 12: Sampling strategy for polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and polycyclic aromatic hydrocarbons (PAHs)
- Part 13: Determination of total (gas and particle-phase) polychlorinated dioxin-like biphenyls (PCBs) and polychlorinated dibenzo-p-dioxins/dibenzofurans (PCDDs/PCDFs) — Collection on sorbent-backed filters
- Part 14: Determination of total (gas and particle-phase) polychlorinated dioxin-like biphenyls (PCBs) and polychlorinated dibenzo-p-dioxins/dibenzofurans (PCDDs/PCDFs) — Extraction, clean-up and analysis by high-resolution gas chromatography and mass spectrometry
- Part 15: Sampling strategy for nitrogen dioxide (NO₂)
- Part 16: Detection and enumeration of moulds — Sampling by filtration
- Part 17: Detection and enumeration of moulds — Culture based method
- Part 18: Detection and enumeration of moulds — Sampling by impaction
- Part 19: Sampling strategy for moulds
- Part 20: Detection and enumeration of moulds — Determination of total spore count
- Part 21: Detection and enumeration of moulds — Sampling from materials
- Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials
- Part 24: Performance test for evaluating the reduction of volatile organic compound (except formaldehyde) concentrations by sorptive building materials
- Part 25: Determination of the emission of semi-volatile organic compounds by building products — Micro-chamber method
- Part 26: Sampling strategy for carbon dioxide (CO₂)
- Part 27: Determination of settled fibrous dust on surfaces by SEM (scanning electron microscopy) (direct method)
- Part 28: Determination of odour emissions from building products using test chambers
- Part 29: Test methods for VOC detectors
- Part 30: Sensory testing of indoor air
- Part 31: Measurement of flame retardants and plasticizers based on organophosphorus compounds — Phosphoric acid ester
- Part 32: Investigation of buildings for the occurrence of pollutants and other injurious factors — Inspections The following parts are under preparation:
- Part 33: Determination of phthalates with gas chromatography/mass spectrometry (GC/MS)

The following parts are under preparation:

- Part 34: Strategies for the measurement of airborne particles (PM_{2,5} fraction)
- Part 35: Measurement of polybrominated diphenylether, hexabromocyclododecane and hexabromobenzene
- Part 36: Test method for the reduction rate of airborne bacteria by air purifiers using a test chamber
- Part 37: Strategies for the measurement of PM_{2,5}

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- Part 38: Determination of amines in indoor and test chamber air — Active sampling on samplers containing phosphoric acid impregnated filters
- Part 39: Determination of amines in indoor and test chamber air — Analysis of amines by means of high-performance liquid chromatography (HPLC) coupled with tandem mass spectrometry (MS MS)
- Part 40: Indoor air quality measurement system

Furthermore

- ISO 12219-1 Interior air of road vehicles — Part 1: Whole vehicle test chamber — Specification and method for the determination of volatile organic compounds in cabin interiors
- ISO 12219-2 Interior air of road vehicles — Part 2: Screening method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials — Bag method
- ISO 12219-3 Interior air of road vehicles — Part 3: Screening method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials — Micro-scale chamber method
- ISO 12219-4 Interior air of road vehicles — Part 4: Method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials — Small chamber method
- ISO 12219-5 Interior air of road vehicles — Part 5: Static chamber method
- ISO 12219-6 Interior air of road vehicles — Part 6: Method for the determination of the emissions of semi-volatile organic compounds from vehicle interior parts and materials at higher temperature – Small chamber method
- ISO 12219-7 Interior air of road vehicles — Part 7: Odour determination in interior air of road vehicles and test chamber air of trim components by olfactory measurements
- 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 16017-2, Indoor, ambient and workplace air — Sampling and analysis of volatile organic compounds by sorbent tube/thermal desorption/capillary gas chromatography — Part 2: Diffusive sampling focus on volatile organic compound (VOC) measurements.

Introduction

Sorptive building materials have been marketed in the form of sheet and board products for removing airborne pollutants via physical sorption or chemical reaction.

Harmonized test methods for evaluating sorptive effects are important for comparative assessment of the performance of sorptive building materials that are used for reducing levels of indoor air contaminants.

This part of ISO 16000 specifies a test method for evaluating the performance of sorptive building materials for reducing indoor air volatile organic compound (VOC) concentrations over time.

The performance of sorptive building materials is evaluated by area specific reduction rate and saturation mass per area and is affected by a number of factors. Specific test conditions are therefore defined in this part of ISO 16000.

This part of ISO 16000 can be applied to most sorptive building materials used indoors and for VOCs (excluding formaldehyde).

This part of ISO 16000 is based on and is complementary to the test chamber method specified in ISO 16000-9.

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Indoor air —

Part 24:

Performance test for evaluating the reduction of volatile organic compound concentrations by sorptive building materials

1 Scope

This part of ISO 16000 specifies a general laboratory test method for evaluating the reduction in concentration of volatile organic compounds (VOCs) by sorptive building materials. This method applies to boards, wallpapers, carpets, paint products, and other building materials. The sorption of those target compound(s), i.e. VOCs can be brought about by adsorption, absorption and chemisorption. The performance of the material, with respect to its ability to reduce the concentration of VOCs in indoor air, is evaluated by measuring area specific reduction rate and saturation mass per area. The former directly indicates material performance with respect to VOC reduction at a point in time; the latter relates to the ability to maintain that performance.

This part of ISO 16000 is based on the test chamber method specified in ISO 16000-9. Sampling, transport and storage of materials to be tested, and preparation of test specimens are described in ISO 16000-11. Air sampling and analytical methods for the determination of VOCs are described in ISO 16000-6 and ISO 16017-1.

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.

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

ISO 6353-3, *Reagents for chemical analysis — Part 3: Specifications — Second series*

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*

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 16000-11, *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 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*

3 Terms and definitions

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

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ISO and IEC maintain terminological databases for use in standardization at the following addresses:

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

3.1**area specific reduction rate** ρ_{ads}

mass of target compound(s) sorbed per time per area at the specified elapsed time from the test start

3.2**breakthrough time** t_b

(indoor air) time at which the target compound(s) concentration in the air eluting from the sample tube reaches 0,5 % of the concentration in the supply air

3.3**degradation coefficient**

(indoor air) ratio of the mass of target compound(s) removed by the initial performance divided by the mass of the same compounds lost by deterioration

3.4**elapsed time** t_e

(indoor air) time from start of test to the start of air sampling

Note 1 to entry: Elapsed time is expressed in hours or days.

3.5

equivalent ventilation rate per area

 $F_{V,eq}$

(indoor air) increased clean air ventilation rate giving the same reduction in target compound(s) concentration as the building material

3.6

guideline concentration

(indoor air) guideline indoor air concentration for a target compound(s) as specified by the WHO or an appropriate national standards body

3.7**half-lifetime**

(indoor air) time elapsed from the start of the test until the target compound(s) concentration reduction performance decreases to one-half of the initial concentration reduction performance

3.8**lifetime** t_t

(indoor air) time period over which the product continues to reduce target compound(s) concentrations

Note 1 to entry: The lifetime is given in days or years.

Note 2 to entry: The lifetime is estimated from the area specific reduction rate and sorption capacity measured by the sample tube test.

3.9**mass transfer coefficient** k_a

(indoor air) coefficient arising from the concentrations difference between the test specimen and ambient air over its surface

Note 1 to entry: Mass transfer coefficient is expressed in meters per hour.