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Indoor air —

Part 23: Performance test for evaluating the reduction of formaldehyde and other carbonyl compounds concentrations by sorptive building materials

Air intérieur —

Partie 23: Essai de performance pour l'évaluation de la réduction des concentrations en formaldéhyde et autres composés carbonylés par des matériaux de construction sorptifs

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, 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.

This document was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 6, *Indoor air*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This second edition cancels and replaces the first edition (ISO 16000-23:2009), which has been technically revised. The main changes compared to the previous edition are as follows.

— The target chemical compounds subject to this document have been changed from formaldehyde only to formaldehyde and other carbonyl compounds.

A list of all parts in the ISO 16000 series can be found on the ISO website.

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 quantitative performance assessment of sorptive building materials that are used for reducing levels of indoor air contaminants.

This document specifies procedures for evaluating the performance of sorptive building materials in reducing indoor air formaldehyde and other carbonyl compounds concentrations over time.

The performance of sorptive building materials is evaluated by measuring the area-specific reduction rate and the saturation mass per area. The former directly indicates material performance with respect to formaldehyde and other carbonyl compounds concentration reduction at a point in time; the latter relates to the ability of a product to maintain such a performance. This is affected by a number of factors and the performance test in conjunction with the standardized sampling, storage of samples and preparation of test specimens has objectives to provide manufacturers, builders, and end users with comparative performance data of sorptive building materials useful for the evaluation of the impact on the indoor air quality, and to promote the development of improved products. Specific test conditions are therefore defined in this document.

This document can be applied to most sorptive building materials used indoors and to formaldehyde and other carbonyl compounds used as an indoor air contaminant. This method does not apply to materials capable of decomposing target compound(s) by catalytic reaction in the presence of ultraviolet and visible rays.

This document is based on the test chamber method as specified in ISO 16000-9.

Indoor air —

Part 23: Performance test for evaluating the reduction of formaldehyde and other carbonyl compounds concentrations by sorptive building materials

1 Scope

This document specifies a general laboratory test method for evaluating the reduction of formaldehyde and other carbonyl compounds (aldehydes and ketones) concentrations by sorptive building materials. This method applies to boards, wallpapers, carpets, paint products, and other building materials. The sorption of those target compounds, i.e. formaldehyde and other carbonyl compounds, can be brought about by adsorption, absorption and chemisorption.

The method specified in this document employs formaldehyde and other carbonyl compound spiked supply air to determine the performance of building materials in reducing formaldehyde and other carbonyl compounds concentrations.

This document 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 specified in ISO 16000-11. Air sampling and analytical methods for the determination of formaldehyde and other carbonyl compounds are specified in ISO 16000-3, which is part of the complete procedure.

This document applies to the determination of formaldehyde and other carbonyl compounds, such as formaldehyde, acetaldehyde, acetone, benzaldehyde, butyraldehyde, valeraldehyde, 2,5-dimethylbenzaldehyde, capronaldehyde, isovaleraldehyde, propionaldehyde, o-tolualdehyde, m-tolualdehyde, p-tolualdehyde.

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.

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, *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*

3 Terms and definitions

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