INTERNATIONAL STANDARD

ISO 16000-30

First edition
2014-09-01

Indoor air —

Part 30: Sensory testing of indoor air

Air intérieur —

Partie 30: Essai sensoriel de l'air intérieur

Reference number
ISO 16000-30:2014(E)

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Published in Switzerland

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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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 146, *Air quality*, Subcommittee SC 6, *Indoor air*.

ISO 16000 consists of the following parts, under the general title *Indoor air*:

— *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)*

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— *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 (NO_2)*

— *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 (CO_2)*

— *Part 28: Determination of odour emissions from building products using test chambers*

— *Part 27: Determination of settled fibrous dust on surfaces by SEM (scanning electron microscopy) (direct method)*

— *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 pollutants and other injurious factors — Inspections*

The following parts are under preparation:

— *Part 33: Determination of phthalates with gas chromatography/mass spectrometry (GC/MS)*

— *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*

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Introduction

Buildings are constructed airtight for reasons of energy saving and efficiency. The natural ventilation by infiltration and windows in airtight buildings does not ensure a sufficient air exchange for the well-being of the occupants and to remove moisture. Indoor odours are more frequently becoming a cause for user complaints. The sources of odours are mainly found inside, but odours also can be brought in from outside the building. These include construction products, materials for interior design, and furnishing including their emission and decomposition products, technical equipment, structural damage, animals, and the occupants themselves. In closed rooms, persistent odours, the existence of which occupants cannot control, are mostly considered objectionable. Exposure to such odours can lead to a decline in both the well-being and productivity of the occupants.

This part of ISO 16000 describes the procedure for the determination of indoor odours with trained or untrained panels. It describes assessment methods and planning, preparation, and execution of the olfactory tests. It also includes criteria and requirements for selection of panel members.

The methods can be applied to sensory evaluation with regard to acceptability, intensity, and hedonics. Olfactory tests of indoor air can either be conducted on site or in a laboratory. In the latter case, air is collected from the site and transported to the laboratory in sampling containers. It is necessary to record the physical conditions in the room during the testing or the sampling of the air, as they can influence the perception of the odours.

Odour testing can be required for hygiene evaluations of indoor air. The evaluation of the reasonability of an odour is an essential part of such an examination.

For the overall assessment of the indoor air, it is recommended that chemical tests be carried out in addition to the sensory tests. This is due to the fact that sensory tests do not provide information about possible health hazards. Chemical analyses are not discussed in this part of ISO 16000.

This part of ISO 16000 is based on VDI 4302-1[12] and VDI 4302-2.[13]

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Indoor air —

Part 30: Sensory testing of indoor air

1 Scope

This part of ISO 16000 specifies sensory testing and the evaluation of indoor odours using human panels. Sensory testing can be performed on site or in laboratories; in the latter case, by means of air in sampling containers which were collected from the site.

The olfactory testing is appropriate for office and administration buildings, assembly halls, residential buildings, and other habitable rooms in which the comfort and health of the occupants is of interest. The test criteria in this part of ISO 16000 are not applicable to factory buildings and workshops or other rooms in which odours unavoidably stem from the production processes (kitchens, bakeries etc.). If an odour evaluation of such rooms is undertaken without the odour-producing processes, it is necessary to take into account that there is a possibility that the processes have influenced and changed the odour of the room through the adsorption of odorous compounds.

Sensory odour tests of indoor air can meet a variety of objectives. These include finding the cause(s) of unpleasant or objectionable odours, determining the reasonability of odours and the usability of affected rooms, and inspecting the results of renovation work. When seeking the cause of odours, it is wise to conduct additional laboratory tests on samples of the component materials according to ISO 16000-28. In the process of locating odour sources by means of olfactory tests, it is necessary to take into account the fact that the odour compounds can accumulate on other surfaces, which exacerbates the problem.

NOTE A risk assessment is intended to be carried out to clarify that no harmful compounds are present in the room. In some countries, an ethics committee can require this.

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.

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

ISO 5496, *Sensory analysis — Methodology — Initiation and training of assessors in the detection and recognition of odours*

ISO 16000-8, *Indoor air — Part 8: Determination of local mean ages of air in buildings for characterizing ventilation conditions*

ISO 16000-28, *Indoor air — Part 28: Determination of odour emissions from building products using test chambers*

EN 13725, *Air quality — Determination of odour concentration by dynamic olfactometry*

3 Terms, definitions, symbols, units, and abbreviations

3.1 Terms and definitions

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

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