



SLOVENSKI STANDARD
SIST EN ISO 16000-2:2006
01-julij-2006

BčlfUb1'nfU_ 'È &"XY. 'GhfUH[]Uj ncf Yb'UZ:fa UXY\]XUfIGC '% \$\$\$!& &\$\$ (L

Indoor air - Part 2: Sampling strategy for formaldehyde (ISO 16000-2:2004)

Innenraumluftverunreinigungen - Teil 2: Probenahmestrategie für Formaldehyd (ISO 16000-2:2004)

Air intérieur - Partie 2: Stratégie d'échantillonnage du formaldéhyde (ISO 16000-2:2004)

ITC STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: EN ISO 16000-2:2006

[SIST EN ISO 16000-2:2006](https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006)

<https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006>

ICS:

13.040.20

SIST EN ISO 16000-2:2006

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 16000-2:2006

<https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006>

ICS 13.040.20

English Version

Indoor air - Part 2: Sampling strategy for formaldehyde (ISO
16000-2:2004)

Air intérieur - Partie 2: Stratégie d'échantillonnage du
formaldéhyde (ISO 16000-2:2004)

Innenraumluftverunreinigungen - Teil 2:
Probenahmestrategie für Formaldehyd (ISO 16000-2:2004)

This European Standard was approved by CEN on 9 March 2006.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN ISO 16000-2:2006](https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006)

<https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

The text of ISO 16000-2:2004 has been prepared by Technical Committee ISO/TC 146 "Air quality" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 16000-2:2006 by Technical Committee CEN/TC 264 "Air quality" 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 October 2006, and conflicting national standards shall be withdrawn at the latest by October 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 16000-2:2004 has been approved by CEN as a EN ISO 16000-2:2006 without any modification.

iTeh STANDARD PREVIEW

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

- *Part 1: General aspects of sampling strategy*
- *Part 2: Measurement strategy for formaldehyde*
- *Part 3: Determination of formaldehyde and other carbonyl compounds – Active sampling method*
- *Part 4: Determination of formaldehyde – Diffusive sampling method*
- *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/FID*

The following parts of ISO 16000 are under preparation:

- *Part 5: Sampling strategy for volatile organic compounds (VOCs)*
- *Part 7: Sampling strategy for determination of airborne asbestos fibre concentrations*
- *Part 8: Ventilation rate measurement*
- *Part 9: Determination of the emission of volatile organic compounds – Emission test chamber method*
- *Part 10: Determination of the emission of volatile organic compounds – Emission test cell method*
- *Part 11: Determination of the emission of volatile organic compounds – Sampling, storage of samples and preparation of test specimens*

Indoor air —

Part 2:

Sampling strategy for formaldehyde

Air intérieur —

Partie 2: Stratégie d'échantillonnage du formaldéhyde

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 16000-2:2006

<https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006>



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 16000-2:2006](https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006)

<https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006>

© ISO 2004

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Sources and occurrence of formaldehyde	1
4 Measurement techniques	3
4.1 General	3
4.2 Short-term monitoring	4
4.3 Long-term monitoring	4
4.4 Methods for screening tests	4
5 Sampling strategy	4
5.1 General	4
5.2 Objectives of the measurement and conditions	4
5.3 Time of sampling	6
5.4 Duration of sampling and frequency of measurement	6
5.5 Sampling location	6
5.6 Reporting on results and uncertainties	6
5.7 Quality assurance	7
Annex A (informative) Properties of formaldehyde	8
Annex B (informative) Overview of important sources and typical concentrations	9
Annex C (informative) Correlation of formaldehyde concentrations in naturally ventilated rooms depending on ventilation	10
Annex D (informative) Dependence of the confidence interval on the number of samples	11
Annex E (informative) Examples of screening tests	12
Bibliography	14

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 16000-2 was prepared by Technical Committee 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 — Active sampling method*
- *Part 4: Determination of formaldehyde — Diffusive sampling method*
- *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/FID*

The following parts of ISO 16000 are under preparation:

- *Part 5: Sampling strategy for volatile organic compounds (VOCs)*
- *Part 7: Sampling strategy for determination of airborne asbestos fibre concentrations*
- *Part 8: Ventilation rate measurement*
- *Part 9: Determination of the emission of volatile organic compounds — Emission test chamber method*
- *Part 10: Determination of the emission of volatile organic compounds — Emission test cell method*
- *Part 11: Determination of the emission of volatile organic compounds — Sampling, storage of samples and preparation of test specimens*

Introduction

This part of ISO 16000 describes basic aspects to be considered when working out a sampling strategy for the analysis of formaldehyde in indoor air.

NOTE The term “formaldehyde” is used in this International Standard instead of the term “methanal”, as specified by IUPAC regulations.

It is intended to be a link between Part 1 of ISO 16000, which describes a measurement strategy, and Parts 3 and 4 of ISO 16000, which describe the analytical procedures dealing with active or diffusive sampling of formaldehyde respectively. This part of ISO 16000 presupposes knowledge of Part 1 of ISO 16000.

The sampling strategy procedure is based on VDI 4300, Part 3^[1].

VOC measurements in different fields of air pollution are described in ISO 16017, *Indoor, ambient and workplace air — Sampling and analysis of volatile organic compounds by sorbent tube/thermal desorption/capillary gas chromatography*

— Part 1: Pumped sampling

— Part 2: Diffusive sampling

ITEH STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 16000-2:2006

<https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 16000-2:2006

<https://standards.iteh.ai/catalog/standards/sist/d6b965e3-71cf-4fc9-aab5-6bc7dd42d96c/sist-en-iso-16000-2-2006>

Indoor air —

Part 2: Sampling strategy for formaldehyde

1 Scope

This part of ISO 16000 is intended as an aid to planning formaldehyde indoor pollution measurements. In the case of indoor air measurements¹⁾, the careful planning of sampling and the entire measurement strategy are of particular significance, since the result of the measurement can have far-reaching consequences, for example, with regard to the need for remedial action or the success of such an action.

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 Guide to the expression of uncertainty in measurement (GUM), published jointly by BIPM/IEC/IFCC/ISO/IUPAC/IUPAP/OIML, first edition 1995

ISO 6879:1995, *Air quality — Performance characteristics and related concepts for air quality measuring methods*

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

ISO 16000-4, *Indoor air — Part 4: Determination of formaldehyde — Diffusive sampling method*

3 Sources and occurrence of formaldehyde

The occurrence of formaldehyde in indoor air is often due to the use of certain wood-based board material for construction and for work on the interior and furnishing of a room. Increased concentrations may also be caused by other products, including use of certain disinfectants and paints. Tobacco smoke is an additional important intermittent source of formaldehyde. Details are given in Table B.1.

Whereas an intermittent emission source (e.g. the use for a limited period of time of disinfectant spray containing formaldehyde) will cause an increased formaldehyde concentration in indoor air for only a short period of time during and after use, a continuous emission source (e.g. a particleboard used for indoor furnishings) will contribute to the formaldehyde concentration over a longer period. Figure 1 shows the influence of humidity and temperature on the emission rate of formaldehyde from particleboard; by increasing humidity and temperature, formaldehyde emission increases considerably.

1) This part of ISO 16000 uses the definition for indoor environment [2], [3] defined in ISO 16000-1.