Indoor air - Part 26: Sampling strategy for carbon dioxide (CO2) (ISO 16000-26:2012)

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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 16000-26:2012 sisaldab Euroopa standardi EN ISO 16000-26:2012 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 16000-26:2012 consists of the English text of the European standard EN ISO 16000-26:2012.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 01.08.2012.	Date of Availability of the European standard is 01.08.2012.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 13.040.20

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 16000-26

August 2012

ICS 13.040.20

English Version

Indoor air - Part 26: Sampling strategy for carbon dioxide (CO_2) (ISO 16000-26:2012)

Air intérieur - Partie 26: Stratégie d'échantillonnage du dioxyde de carbone (CO_2) (ISO 16000-26:2012)

Innenraumluftverunreinigungen - Teil 26: Probenahmestrategie für Kohlendioxid (CO_2) (ISO 16000-26:2012)

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Ref. No. EN ISO 16000-26:2012: E

Foreword

This document (EN ISO 16000-26:2012) has been prepared by Technical Committee ISO/TC 146 "Air quality" in collaboration with 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of an identical text or by endorsement, at the latest by February 2013, and conflicting national standards shall be withdrawn at the latest by February 2013.

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Endorsement notice

The text of ISO 16000-26:2012 has been approved by CEN as a EN ISO 16000-26:2012 without any modification.

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Introduction

In ISO 16000-1, general requirements relating to the measurement of indoor air pollutants and the important conditions to be observed before or during the sampling of individual pollutants or groups of pollutants are described.

This part of ISO 16000 describes basic aspects to be considered when working out a sampling strategy for the measurements of carbon dioxide in indoor air. It is intended to be a link between ISO 16000-1 and the analytical procedures.

This part of ISO 16000 presupposes knowledge of ISO 16000-1.

This part of ISO 16000 uses the definition for indoor environment defined in ISO 16000-1 and Reference [12] as dwellings having living rooms, bedrooms, DIY (do-it-yourself) rooms, recreation rooms and cellars, kitchens and bathrooms; workrooms or work places in buildings which are not subject to health and safety inspections with regard to air pollutants (for example, offices, sales premises); public buildings (for example hospitals, schools, kindergartens, sports halls, libraries, restaurants and bars, theatres, cinemas and other function rooms), and also cabins of vehicles and public transport.

The sampling strategy procedure described in this part of ISO 16000 is based on VDI 4300 Part 9.[11]

Indoor air —

Part 26:
Sampling strategy for carbon dioxide (CO_2)

1 Scope

This part of ISO 16000 specifies the planning of carbon dioxide indoor pollution measurements. In the case of indoor air measurements, 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 ascertaining the need for remedial action or the success of such an action.

An inappropriate measurement strategy can lead to misrepresentation of the true conditions or, worse, to erroneous results.

This part of ISO 16000 is not applicable to the measurement strategy for carbon monoxide (CO).

NOTE See 5.1.

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 16000-1:2004, *Indoor air — Part 1: General aspects of sampling strategy*

3 Properties, origin and occurrence of carbon dioxide

Carbon dioxide (CO_2, CAS No. 124-38-9) is a natural constituent of atmospheric air, where it is present on average at a content of a little over 0,03 % (volume fraction; equal to about 600 mg/m^3). CO_2 content measured in air is usually reported in the unit parts per million (1 ppm as a volume fraction is 1 µmol/mol), 0,03 % as volume fraction being equivalent to 300 ppm. Some CO_2 reacts under indoor conditions with atmospheric humidity to form carbonic acid. CO_2 is colourless, odourless and without taste, readily water soluble and chemically stable under standard conditions. The CO_2 molecule can absorb part of the infrared radiation reflected by the Earth's surface as heat radiation and thus contributes to a process termed "greenhouse effect", which causes global warming.

Carbon dioxide plays a central role in the processes of life on Earth. As a result of plant activity (from carbon dioxide and water, under the action of sunlight in the presence of chlorophyll as catalyst), organic compounds (predominantly carbohydrates) are formed, as well as the oxygen which is essential for life on Earth. More or less in reverse to this process, CO_2 is formed in the air as one of the end-products (in addition to water) of combustion of hydrocarbons. This process proceeds firstly in every type of combustion apparatus and fireplace, but secondly also plays an important role in the metabolism of living organisms. The CO_2 formed in metabolic processes is released to the ambient air.

In the case of humans, the amount released depends on the extent of physical activity. For adult persons, the orders of magnitude listed in Table A.1 of the volume of CO_2 released can be assumed (see Annex A for more detailed explanations).

Since the beginning of industrialization, the CO_2 concentration of the ambient air has been continuously rising. CO_2 measurement sites in the past were usually linked with meteorological stations and were situated in clean air regions. One of the best-known CO_2 measurement sites is on Mauna Loa in Hawaii. There, uninfluenced by any local CO_2 source, the CO_2 concentration increased, for example, from 316,0 ppm in 1959 to 369,4 ppm in