

**Ruumiõhk. Osa 15: Lämmastikdioksiidi (NO₂)
proovide võtmise strateegia**

Indoor air - Part 15: Sampling strategy for nitrogen dioxide (NO₂)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 16000-15:2008 sisaldab Euroopa standardi EN ISO 16000-15:2008 ingliskeelset teksti.

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English Version

Indoor air - Part 15: Sampling strategy for nitrogen dioxide
(NO₂) (ISO 16000-15:2008)

Air intérieur - Partie 15: Stratégie d'échantillonnage du
dioxyde d'azote (NO₂) (ISO 16000-15:2008)

Innenraumluftverunreinigungen - Teil 15:
Probenahmestrategie für Stickstoffdioxid (NO₂) (ISO
16000-15:2008)

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Foreword

This document (EN ISO 16000-15:2008) 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of an identical text or by endorsement, at the latest by January 2009, and conflicting national standards shall be withdrawn at the latest by January 2009.

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Endorsement notice

The text of ISO 16000-15:2008 has been approved by CEN as a EN ISO 16000-15:2008 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 nitrogen dioxide in indoor air. It is intended to be a link between ISO 16000-1, *Indoor air — Part 1: General aspects of sampling strategy*, 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 [1] 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 4300-5 [2].

Indoor air —

Part 15:

Sampling strategy for nitrogen dioxide (NO₂)

1 Scope

This part of ISO 16000 specifies the planning of nitrogen 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 may 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 may lead to misrepresentation of the true conditions or, worse, to erroneous results.

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 nitrogen dioxide

Nitrogen dioxide (NO₂, CAS No. 10102-44-0) is one of the important substances of the class of nitrous gases or nitrogen oxides. NO₂ is a reddish-brown gas with a sweet to pungent odour, which is also present to a minor extent as dimeric colourless N₂O₄. Information on properties of NO₂ and its effects on humans is summarized elsewhere (see References [3], [4], [5], [6] and [7]).

In all combustion processes, nitrogen oxides (NO_x) are formed by reaction of nitrogen and oxygen. The main combustion product is nitrogen monoxide (NO), a certain fraction of which reacts further with oxygen to form nitrogen dioxide. This reaction is exothermic so that cooling combustion exhaust gases promotes this secondary NO₂ formation.

In ambient air, heating power stations, motor vehicles, industrial heating systems and building heating systems are the most important emission sources of NO₂. Indoor NO₂ emissions are formed from combustion sources such as heating and cooking with solid fuel (wood, coal), liquid fuel (oil, kerosene) or gaseous fuel [town gas, natural gas, bottled gas (propane, butane)], especially in the initial heating phase. An unflued appliance that releases combustion gases directly into the indoor air can be a particularly strong source. In the literature, there are many reports on the results of NO₂ determinations in indoor air (see References [4], [8], and [9]). On the basis of these results, the average concentrations may range from under 10 µg/m³ to 800 µg/m³ under different conditions ²⁾.

2) In the literature, some concentrations are also reported in ppm (1 mg/m³ corresponds to 0,53 ppm at 293 K and 1,013 bar).