

Acoustics - Measurement of room acoustic parameters -  
Part 3: Open plan offices (ISO 3382-3:2022)

## EESTI STANDARDI EESSÕNA

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See Eesti standard EVS-EN ISO 3382-3:2022 sisaldab Euroopa standardi EN ISO 3382-3:2022 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 3382-3:2022 consists of the English text of the European standard EN ISO 3382-3:2022.
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 and Accreditation.
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English Version

Acoustics - Measurement of room acoustic parameters -  
Part 3: Open plan offices (ISO 3382-3:2022)

Acoustique - Mesurage des paramètres acoustiques des  
salles - Partie 3: Bureaux ouverts (ISO 3382-3:2022)

Akustik - Messung von Parametern der Raumakustik -  
Teil 3: Großraumbüros (ISO 3382-3:2022)

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

## European foreword

This document (EN ISO 3382-3:2022) has been prepared by Technical Committee ISO/TC 43 "Acoustics" in collaboration with Technical Committee CEN/TC 126 "Acoustic properties of building elements and of buildings" the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by July 2022, and conflicting national standards shall be withdrawn at the latest by July 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 3382-3:2012.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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

## Endorsement notice

The text of ISO 3382-3:2022 has been approved by CEN as EN ISO 3382-3:2022 without any modification.

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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](http://www.iso.org/directives)).

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For an explanation of 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 [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 2, *Building acoustics*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 126, *Acoustic properties of building products and buildings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 3382-3:2012), which has been technically revised. The main changes compared to the previous edition are as follows:

- new single-number quantity, comfort distance, added, and privacy distance removed;
- sole use of omnidirectional sound source in all measurement phases emphasized;
- definitions ([Clause 3](#)), measurement conditions ([Clause 4](#)), and determination of single-number values ([Clause 5](#)) clarified;
- use of impulse response method better described and a new [Annex B](#) added;
- [Clause 6](#) “Precision” and an informative [Annex D](#) were added;
- STI is determined in conformity with IEC 60268-16 using weighting factors  $\alpha$  and  $\beta$  for male gender;

A list of all parts in the ISO 3382 series can be found on the ISO website.

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](http://www.iso.org/members.html).

## Introduction

Open-plan office is a large and open office space where large number of occupants can simultaneously work in well-defined workstations. Both flexible offices and activity-based offices often involve spaces that resemble open-plan offices. Open working areas, which can be considered as open-plan offices, can also be found in many libraries, hospital wards, industrial workplaces, and schools.

Noise and lack of speech privacy are among the largest contributors to environmental dissatisfaction in open-plan offices<sup>[1]</sup>. Colleagues' speech is the main source of office noise. Inadequate room acoustic design of the office is one reason to the perception of noise and lack of speech privacy. Distraction due to colleagues' speech weakens the ability to concentrate and reduces work performance, especially in tasks requiring cognitive resources. Insufficient speech privacy prevents confidential conversations. Several experimental studies suggest that distraction can be reduced by reducing speech intelligibility<sup>[2]</sup><sup>[3]</sup>. A large field survey supports that reduced speech intelligibility is associated with reduced noise disturbance<sup>[4]</sup>. According to Reference [4], many of the single-number quantities described in this standard are associated with the perceived noise disturbance in open-plan offices.

The outcomes of this method describe the acoustic performance of the open-plan office in a standardized condition where a single occupant is speaking with normal speech effort<sup>[5]</sup>. The background sound caused by building appliances or sound masking system is considered in the measurements. The measurements are conducted in an unoccupied open-plan office because the method concerns the permanent building properties and stable room acoustic conditions as well as ISO 3382-1 and ISO 3382-2. The activity sound caused by the occupants does not belong to the scope of this standard, although the level of activity sound can be significantly larger than the level of background sound.

The method uses omnidirectional sound source to provide reproducible results between measurement operators. Furthermore, the speaking direction of occupant in the office workstation is not always known nor constant in time. The use of directional sound sources would lead into different results between measurement operators due to different choices of source direction and source directivities.

Room acoustic quality can be affected by the amount and positioning of wall and ceiling sound absorption materials, room geometry, workstations, screens, other furniture, floor coverings, and background sound level (e.g., masking sound). Presentation of acoustic design guidelines is beyond the scope of this document because literature gives sufficient advice how to reach good room acoustic quality<sup>[5]</sup><sup>[6]</sup><sup>[7]</sup>.

# Acoustics — Measurement of room acoustic parameters —

## Part 3: Open plan offices

### 1 Scope

This document specifies a method for the measurement of room acoustic parameters in unoccupied open-plan offices. It specifies measurement procedures, the apparatus needed, the coverage required, the method for evaluating the data, and the presentation of the test report.

This document describes a group of single-number quantities indicating the room acoustic performance of an open-plan office in a condition when one person is speaking. They focus on spatial decay of speech while the quantities in ISO 3382-2 focus on temporal decay of sound.

### 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 3382-1, *Acoustics — Measurement of room acoustic parameters — Part 1: Performance spaces*

IEC 60268-16, *Sound system equipment — Part 16: Objective rating of speech intelligibility by speech transmission index*

IEC 60942, *Electroacoustics — Sound calibrators*

IEC 61260, *Electroacoustics — Octave-band and fractional-octave-band filters*

IEC 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications*

### 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

#### 3.1

#### **omnidirectional sound source**

#### **OSS**

sound source which radiates sound evenly to all directions