

AKUSTIKA. MÜRAEKSPOSITSIOONI MÄÄRAMINE
TÖÖKESKKONNAS. METOODIKA

Acoustics - Determination of occupational noise
exposure - Methodology (ISO 9612:2025)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>See Eesti standard EVS-EN ISO 9612:2025 sisaldab Euroopa standardi EN ISO 9612:2025 ingliskeelset teksti.</p> <p>Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 04.06.2025.</p> <p>Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.</p>	<p>This Estonian standard EVS-EN ISO 9612:2025 consists of the English text of the European standard EN ISO 9612:2025.</p> <p>This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.</p> <p>Date of Availability of the European standard is 04.06.2025.</p> <p>The standard is available from the Estonian Centre for Standardisation and Accreditation.</p>
--	---

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

ICS 13.140

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele. Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis- ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardimis- ja Akrediteerimiskeskusega: Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation and Accreditation: Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

EN ISO 9612

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2025

ICS 13.140

Supersedes EN ISO 9612:2009

English Version

Acoustics - Determination of occupational noise exposure - Methodology (ISO 9612:2025)

Acoustique - Détermination de l'exposition au bruit en
milieu de travail - Méthodologie (ISO 9612:2025)

Akustik - Bestimmung der Lärmexposition am
Arbeitsplatz - Methodik (ISO 9612:2025)

This European Standard was approved by CEN on 5 March 2024.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Türkiye and United Kingdom.



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

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

European foreword

This document (EN ISO 9612:2025) has been prepared by Technical Committee ISO/TC 43 "Acoustics" in collaboration with Technical Committee CEN/TC 211 "Acoustics" 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 December 2025, and conflicting national standards shall be withdrawn at the latest by December 2025.

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 9612:2009.

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, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 9612:2025 has been approved by CEN as EN ISO 9612:2025 without any modification.

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols	3
5 Instrumentation	5
5.1 Sound level meters and personal sound exposure meters.....	5
5.2 Calibrator.....	5
5.3 Periodic verification.....	6
6 Methodology – Chronological steps	6
6.1 Step 1: Work analysis.....	6
6.2 Step 2: Selection of the measurement strategy.....	6
6.3 Step 3: Measurements.....	6
6.4 Step 4: Error handling and uncertainties.....	6
6.5 Step 5: Calculation and presentation of results and uncertainty.....	6
7 Work analysis	6
7.1 General.....	6
7.2 Defining homogeneous noise exposure groups (HEG).....	7
7.3 Determination of a nominal day.....	7
8 Selection of measurement strategies	8
8.1 General.....	8
8.2 Measurement strategies.....	8
9 Strategy 1 – Task-based measurement	8
9.1 Dividing the nominal day into tasks.....	8
9.2 Duration of tasks.....	8
9.3 Measurement of L_{p,A,eqT_m} for tasks.....	9
9.3.1 General.....	9
9.3.2 Number of measurements.....	9
9.3.3 Time and duration of measurements.....	10
9.3.4 Calculation of the A-weighted equivalent continuous sound pressure level.....	10
9.4 Calculation of contribution from each task to daily noise exposure level.....	10
9.5 Determination of daily noise exposure level.....	11
10 Strategy 2 – Job-based measurement	12
10.1 General.....	12
10.2 Measurement plan – Number, duration and distribution of measurements.....	12
10.3 Measurements.....	12
10.4 Determination of daily noise exposure levels for workers in a homogeneous noise exposure group.....	13
11 Strategy 3 – Full-day measurement	13
11.1 General.....	13
11.2 Observing work activities and monitoring measurements.....	14
11.3 Measurements.....	14
11.4 Determination of daily noise exposure level.....	15
12 Measurements	15
12.1 Selection of instrumentation.....	15
12.2 Field calibration.....	15
12.3 Instrument worn by the worker.....	15

12.4	Integrating-averaging sound level meter	16
13	Sources of uncertainty and errors	17
13.1	General	17
13.2	Mechanical impacts on microphone	17
13.3	Wind and airflows	18
13.4	Relevance of sound contributions	18
14	Calculation of measurement uncertainties and presentation of the final results	18
15	Information to be reported	18
Annex A	(informative) Example of a checklist to ensure that significant noise events are detected during the work analysis	21
Annex B	(informative) Guidance to the selection of measurement strategy	22
Annex C	(normative) Evaluation of measurement uncertainties	25
Annex D	(informative) Example showing calculation of daily noise exposure level using task-based measurements	34
Annex E	(informative) Example showing calculation of daily noise exposure level using job-based measurements	39
Annex F	(informative) Sample calculation of daily noise exposure level using full-day measurements	42
Annex G	(informative) Example calculation of daily noise exposure level for flexible workers	45
Annex H	(normative) Uncertainty calculation for peak sound pressure levels	49
Bibliography	53

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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.

This document was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 211, *Acoustics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 9612:2009), which has been technically revised.

The main changes are as follows:

- A reshaping of the guidance on measurement of L_{p,A,eqT_m} for the task-based strategy (9.3).
- A revision of the measurement plan for the job-based strategy (10.2).
- The addition of Homogeneous noise Exposure Groups (HEG) sampling requirements for the full-day measurement strategy and the addition of criteria to validate sampling (11.3).
- Some precisions and clarifications on the instrumentation section.
- Some additions to the test report section: number of peak events, $L_{EX,8h,95\%}$.
- The addition of C.7 in Annex C, which gives the formulae to calculate the measurement uncertainty when multiple nominal days are used. An Annex H is also introduced to clarify uncertainty of peak measurements.
- The introduction of a new Annex G.
- The introduction of a new Annex H.
- A full revision of the Excel calculation file attached to this document.

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.

Introduction

This document provides a stepwise approach to the determination of occupational noise exposure from noise level measurements. The procedure contains the following major steps: work analysis, selection of measurement strategy, measurements, error handling and uncertainty evaluations, calculations, and presentation of results. This document specifies three different measurement strategies: task-based measurement; job-based measurement; and full-day measurement. This document gives guidance on selecting an appropriate measurement strategy for a particular work situation and purpose of investigation. This document also provides an informative spreadsheet to allow calculation of measurement results and uncertainties. ISO is not responsible for errors that shall arise or occur with the use of this spreadsheet.

This document recognizes the use of hand-held sound level meters as well as personal sound exposure meters. The methods specified optimize the effort required for obtaining a given accuracy.

Acoustics — Determination of occupational noise exposure — Methodology

1 Scope

This document specifies a method for measuring workers' exposure to noise in a working environment and calculating the noise exposure level. This document deals with A-weighted levels but is applicable also to C-weighted levels. Three different strategies for measurement are specified. The method is applicable for detailed noise exposure studies or epidemiological studies of hearing damage or other adverse effects.

The measuring process requires observation and analysis of the noise exposure conditions so that the quality of the measurements can be controlled. This document provides methods for estimating the uncertainty of the results.

This document is not intended for assessment of masking of oral communication or assessment of infrasound, ultrasound and non-auditory effects of noise. It does not apply to the measurement of the noise exposure of the ear when hearing protectors are worn.

Results of the measurements performed in accordance with this document can provide useful information when defining priorities for noise control measures.

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 1999, *Acoustics — Estimation of noise-induced hearing loss*

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

IEC 60942, *Electroacoustics — Sound calibrators*

IEC 61252, *Electroacoustics — Specifications for personal sound exposure meters*

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 terminology 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/>