

**Akustika. Mürallikate helivõimsuse tasemete
kindlaksmääramine helirõhu abil. Võrdlusmeetod in situ**

Acoustics - Determination of sound power levels of noise
sources using sound pressure - Comparison method in situ

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 3747:2009 sisaldab Euroopa standardi EN ISO 3747:2009 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 30.09.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 05.08.2009.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN ISO 3747:2009 consists of the English text of the European standard EN ISO 3747:2009.

This standard is ratified with the order of Estonian Centre for Standardisation dated 30.09.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 05.08.2009.

The standard is available from Estonian standardisation organisation.

ICS 17.140.01

Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Eesti; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

Right to reproduce and distribute Estonian Standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:
Aru str 10 Tallinn 10317 Estonia; www.evs.ee; Phone: +372 605 5050; E-mail: info@evs.ee

English Version

**Acoustics - Determination of sound power levels of noise
sources using sound pressure - Comparison method in situ (ISO
3747:2000)**

Acoustique - Détermination des niveaux de puissance
acoustique émis par les sources de bruit à partir de la
pression acoustique - Méthode de comparaison pour une
utilisation in situ (ISO 3747:2000)

Akustik - Bestimmung der Schalleistungspegel von
Geräuschquellen aus Schalldruckmessungen -
Vergleichsverfahren zur Verwendung unter
Einsatzbedingungen (ISO 3747:2000)

This European Standard was approved by CEN on 20 July 2009.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of ISO 3747:2000 has been prepared by Technical Committee ISO/TC 43 "Acoustics" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 3747:2009 by Technical Committee CEN/TC 211 "Acoustics" the secretariat of which is held by DS.

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 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.

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

This document supersedes EN ISO 3747:2000.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directives.

For relationship with EC Directives, see informative Annexes ZA and ZB, which are integral parts of this document.

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, 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 the United Kingdom.

Endorsement notice

The text of ISO 3747:2000 has been approved by CEN as a EN ISO 3747:2009 without any modification.

Annex ZA (informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 98/37/EC, amended by 98/79/EC on machinery.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

WARNING - Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Annex ZB (informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Test methodology.....	3
4.1 General.....	3
4.2 Accuracy.....	3
5 Measurement uncertainty	3
6 Instrumentation.....	4
6.1 Instrumentation system	4
6.2 Calibration	4
7 Operating conditions of the source under test	5
8 Preliminary survey.....	6
8.1 Background noise.....	6
8.2 Characterization of the source under test	6
9 Positions of the reference sound source.....	6
9.1 One position.....	6
9.2 More than one position	6
10 Measurement procedure	7
10.1 Selection of microphone positions.....	7
10.2 Measurements.....	8
10.3 Correction for background noise.....	8
10.4 Evaluation of the measurement uncertainty.....	9
11 Calculation of sound power levels.....	9
11.1 One RSS position.....	9
11.2 Several RSS positions.....	9
11.3 A-weighted sound power level.....	9
12 Information to be recorded	10
13 Information to be reported.....	11
Annex A (normative) Evaluation of ΔL_f and of the measurement uncertainty.....	12
Annex B (informative) Recommendations for the location of the reference sound source and the microphones, if only one RSS position is used	14
Bibliography	18

Introduction

This International Standard is one of the ISO 3740 series which, together with ISO 9614, specifies various methods for determining sound power levels of machines, equipment and sub-assemblies thereof. When selecting one of the methods of the 3740 series, it is necessary to decide which one is most appropriate for the conditions and purposes of the test. General guidelines to assist in the selection are provided in ISO 3740. Insofar as the operating and mounting conditions of the machine or equipment under test are concerned, only general principles are given in the ISO 3740 series. Reference should be made to the test code for a specific type of machine or equipment, if available, for specifications on mounting and operating conditions.

Acoustics — Determination of sound power levels of noise sources using sound pressure — Comparison method *in situ*

1 Scope

1.1 This International Standard specifies a method for determining the sound power levels of sound sources *in situ*, especially if non-movable. A comparison method is used and all measurements are carried out in octave bands. The measurement uncertainty depends on the test environment. The measurement uncertainty is evaluated by comparing with an indicator describing the spatial sound distribution. The accuracy will either be that of an engineering method or a survey method.

The sound power level of the source under test is calculated from the measured values of the sound pressure levels produced at specified measurement points by the source and by a reference sound source, respectively. The sound power level is calculated using the calibrated values of the reference sound source and the differences between the values obtained with the source under test and those of the reference sound source. All calculations are carried out in octave bands, from which the A-weighted sound power level is determined.

NOTE For noise sources which can be moved, other relevant standards in the ISO 3740 series may be used.

1.2 This International Standard is applicable to all kinds of test environments which are to be found outside a laboratory environment, provided that the background noise level is sufficiently low and the sound pressure level at the microphone positions depends mainly on reflections from the room surfaces.

NOTE ISO 3744 or ISO 9614 may provide alternative methods.

1.3 This International Standard is primarily applicable to sources which radiate broad-band noise. It may, however, also be used for sources which radiate narrow-band noise or discrete tones, although the measurement uncertainty might then become larger than stated herein.

NOTE For noise sources emitting stationary noise, ISO 9614 may be used as an alternative.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 6926, *Acoustics — Requirements for the performance and calibration of reference sound sources used for the determination of sound power levels*.

ISO 7574-1, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 1: General considerations and definitions*.

IEC 60942, *Electroacoustics — Sound calibrators*.

IEC 61260:1995, *Electroacoustics — Octave-band and fractional-octave band filters*.

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

This document is a preview generated by EVS