

**SLOVENSKI STANDARD**  
**SIST EN ISO 3746:2009**

**01-november-2009**

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**SIST EN ISO 3746:1997**

**SIST EN ISO 3746:1997/AC1:1997**

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Acoustics - Determination of sound power levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995, including Cor 1:1995)

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Akustik - Bestimmung der Schalleistungspegel von Geräuschquellen aus Schalldruckmessungen - Hüllflächenverfahren der Genauigkeitsklasse 3 über einer reflektierenden Ebene (ISO 3746:1995, einschließlich Cor 1:1995)

Acoustique - Détermination des niveaux de puissance acoustique émis par les sources de bruit à partir de la pression acoustique - Méthode de contrôle employant une surface de mesure enveloppante au-dessus d'un plan réfléchissant (ISO 3746:1995, Cor 1:1995 inclus)

**Ta slovenski standard je istoveten z: EN ISO 3746:2009**

**ICS:**

17.140.01 Acoustic measurements and noise abatement in general

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN ISO 3746

July 2009

ICS 17.140.01

Supersedes EN ISO 3746:1995

English Version

Acoustics - Determination of sound power levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995, including Cor 1:1995)

Acoustique - Détermination des niveaux de puissance acoustique émis par les sources de bruit à partir de la pression acoustique - Méthode de contrôle employant une surface de mesure enveloppante au-dessus d'un plan réfléchissant (ISO 3746:1995, Cor 1:1995 inclus)

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This European Standard was approved by CEN on 13 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.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

<b>Contents</b>	<b>Page</b>
<b>Foreword</b> .....	<b>3</b>
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC</b> .....	<b>4</b>
<b>Annex ZB (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC</b> .....	<b>5</b>

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## Foreword

The text of ISO 3746:1995, including Cor 1:1995 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 3746:2009 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 January 2010, and conflicting national standards shall be withdrawn at the latest by January 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 3746:1995.

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.

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### Endorsement notice

The text of ISO 3746:1995, including Cor 1:1995 has been approved by CEN as a EN ISO 3746:2009 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.

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## 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.

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# INTERNATIONAL STANDARD

# ISO 3746

Second edition  
1995-08-15

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## Acoustics — Determination of sound power levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane

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*SIST EN ISO 3746:2009*  
Acoustique — Détermination des niveaux de puissance acoustique émis  
par les sources de bruit à partir de la pression acoustique — Méthode de  
contrôle employant une surface de mesure enveloppante au-dessus d'un  
plan réfléchissant



Reference number  
ISO 3746:1995(E)

## ISO 3746:1995(E)

## Contents

Page

<b>1</b>	Scope .....	<b>1</b>
<b>2</b>	Normative references .....	<b>3</b>
<b>3</b>	Definitions .....	<b>3</b>
<b>4</b>	Acoustic environment .....	<b>4</b>
<b>5</b>	Instrumentation .....	<b>5</b>
<b>6</b>	Installation and operation of source under test .....	<b>5</b>
<b>7</b>	Measurement of sound pressure levels .....	<b>7</b>
<b>8</b>	Calculation of A-weighted surface sound pressure level and A-weighted sound power level .....	<b>10</b>
<b>9</b>	Information to be recorded .....	<b>12</b>
<b>10</b>	Information to be reported .....	<b>13</b>

## Annexes

iTeh STANDARD PREVIEW

(standards.iteh.ai)

<b>A</b>	Qualification procedures for the acoustic environment .....	<b>14</b>
<b>B</b>	Microphone array on the hemispherical measurement surface .....	<b>17</b>
<b>C</b>	Microphone array on the parallelepiped measurement surface .....	<b>21</b>
<b>D</b>	Guidelines for the detection of impulsive noise .....	<b>26</b>
<b>E</b>	Bibliography .....	<b>27</b>

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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International Standard ISO 3746 was prepared by Technical Committee ISO/TC 43, Acoustics, Subcommittee SC 1, Noise.

This second edition cancels and replaces the first edition (ISO 3746:1979), which has been technically revised.

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Annexes A, B and C form an integral part of this International Standard. Annexes D and E are for information only.

## Introduction

**0.1** This International Standard is one of the ISO 3740 series, which specifies various methods for determining the sound power levels of machines, equipment and their sub-assemblies. When selecting one of the methods of the ISO 3740 series, it is necessary to select the most appropriate for the conditions and purposes of the noise test. General guidelines to assist in the selection are provided in ISO 3740. The ISO 3740 series gives only general principles regarding the operating and mounting conditions of the machine or equipment under test. 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.

**0.2** This International Standard specifies a method for measuring the sound pressure levels on a measurement surface enveloping the source and for calculating the sound power level produced by the source. The enveloping surface method can be used for any of three grades of accuracy (see table 0.1), and is used in this International Standard for grade 3 accuracy.

The use of this International Standard requires certain qualification criteria to be fulfilled as described in table 0.1. If the relevant qualification criteria cannot be met, it might be possible to use ISO 3747 or ISO 9614.

Noise test codes for specific families of machines or equipment should be based without any contradiction on the requirements of one or more of the basic documents of the ISO 3740 or ISO 9614 series.

If measurements are made in typical machine rooms, where sources are normally installed, corrections may be required to account for background noise or undesired reflections.

The methods specified in this International Standard permit the determination of sound power level as an A-weighted value directly from the A-weighted sound pressure level measurements.

**0.3** In this International Standard, the computation of sound power level from sound pressure level measurements is based on the premise that the sound power output of the source is directly proportional to the mean-square sound pressure averaged in time and space.

**Table 0.1 — Overview of International Standards for determination of sound power levels of noise sources using enveloping surface methods over a reflecting plane and giving different grades of accuracy**

Parameter	ISO 3745 Precision method Grade 1	ISO 3744 Engineering method Grade 2	ISO 3746 Survey method Grade 3
Test environment	Hemi-anechoic room	Outdoors or indoors	Outdoors or indoors
Criterion for suitability of test environment <sup>1)</sup>	$K_2 \leq 0,5$ dB	$K_2 \leq 2$ dB	$K_2 \leq 7$ dB
Volume of sound source	Preferably less than 0,5 % of test room volume	No restriction: limited only by available test environment	No restriction: limited only by available test environment
Character of noise	Any (broad-band, narrow-band, discrete-frequency, steady, non-steady, impulsive)		
Limitation for background noise <sup>1)</sup>	$\Delta L \geq 10$ dB (if possible, exceeding 15 dB) $K_1 \leq 0,4$ dB	$\Delta L \geq 6$ dB (if possible, exceeding 15 dB) $K_1 \leq 1,3$ dB	$\Delta L \geq 3$ dB $K_1 \leq 3$ dB
Number of measurement points	$\geq 10$	$\geq 9$ <sup>2)</sup>	$\geq 4$ <sup>2)</sup>
Instrumentation: a) Sound level meter at least complying with b) Integrating sound level meter at least complying with c) Frequency band filter set at least complying with	a) type 1 as specified in IEC 651 b) type 1 as specified in IEC 804 c) class 1 as specified in IEC 1260	a) type 1 as specified in IEC 651 b) type 1 as specified in IEC 804 c) class 1 as specified in IEC 1260	a) type 2 as specified in IEC 651 b) type 2 as specified in IEC 804 —
Precision of method for determining $L_{WA}$ expressed as standard deviation of reproducibility	$\sigma_R \leq 1$ dB	$\sigma_R \leq 1,5$ dB	$\sigma_R \leq 3$ dB (if $K_2 < 5$ dB) $\sigma_R \leq 4$ dB (if $5 \text{ dB} \leq K_2 \leq 7$ dB) If discrete tones are predominant, the value of $\sigma_R$ is 1 dB greater
<p>1) The values of <math>K_1</math> and <math>K_2</math> given shall be met in each frequency band within the frequency range of interest for determining the sound power spectrum. For determining A-weighted sound power levels, the same criteria apply to <math>K_{1A}</math> and <math>K_{2A}</math>.</p> <p>2) Under given circumstances, it is permissible to use a reduced number of microphone positions.</p>			