SLOVENSKI STANDARD
SIST EN ISO 9614-3:2009

01-november-2009

Nadomeģ a:
SIST EN ISO 9614-3:2003

Akustika - Ugotavljanje ravni zvoģ nih moģ i virov hrupa z merjenjem jakosti zvoka - 3. del: Precizijska metoda zveznega merjenja po ploskvi (ISO 9614-3:2002)

Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 3: Precision method for measurement by scanning (ISO 9614-3:2002)

Akustik - Bestimmung der Schallleistungspegel von Geräuschquellen aus Schallintensitätsmessungen - Teil 3: Scanning-Verfahren der Genauigkeitsklasse 1 (ISO 9614-3:2002)

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Acoustique - Détermination par intensimétrie des niveaux de puissance acoustique émis par les sources de bruit - Partie 3: Méthode de précision pour mesurage par balayage (ISO 9614-3:2002)

Ta slovenski standard je istoveten z: **EN ISO 9614-3:2009**

ICS:

17.140.01	Akustiģ na merjenja in blaģenje hrupa na sploģno	Acoustic measurements and noise abatement in general

SIST EN ISO 9614-3:2009 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 9614-3

August 2009

ICS 17.140.01

Supersedes EN ISO 9614-3:2002

English Version

Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 3: Precision method for measurement by scanning (ISO 9614-3:2002)

Acoustique - Détermination par intensimétrie des niveaux de puissance acoustique émis par les sources de bruit - Partie 3: Méthode de précision pour mesurage par balayage (ISO 9614-3:2002)

Akustik - Bestimmung der Schallleistungspegel von Geräuschquellen aus Schallintensitätsmessungen - Teil 3: Scanning-Verfahren der Genauigkeitsklasse 1 (ISO 9614-3:2002)

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

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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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SIST EN ISO 9614-3:2009

Foreword

The text of ISO 9614-3:2002 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 9614-3:2009 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 9614-3:2002.

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.

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Endorsement notice

The text of ISO 9614-3:2002 has been approved by CEN as a EN ISO 9614-3:2009 without any modification.

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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.

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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 9614-3

First edition
2002-11-01

Acoustics — Determination of sound power levels of noise sources using sound intensity —

Part 3: Precision method for measurement by scanning

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Acoustique — Détermination par intensimétrie des niveaux de puissance acoustique émis par les sources de bruit —

Partie 3: Méthode de précision pour mesurage par balayage

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Reference number
ISO 9614-3:2002(E)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this part of ISO 9614 may be the subject of patent rights other than those identified above. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 9614-3 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

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ISO 9614 consists of the following parts, under the general title *Acoustics — Determination of sound power levels of noise sources using sound intensity*:

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— *Part 1: Measurement at discrete points*

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— *Part 2: Measurement by scanning*

— *Part 3: Precision method for measurement by scanning*

Annexes B and C form a normative part of this part of ISO 9614. Annexes A, D, E, F, G, H and I are for information only.

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Introduction

0.1 The sound power radiated by a source is equal in value to the integral of the scalar product of the sound intensity vector and the associated elemental area vector over any surface totally enclosing the source. Other International Standards which describe methods of determination of the sound power levels of noise sources, principally ISO 3740 to ISO 3747, without exception specify sound pressure level as the primary acoustic quantity to be measured. The relationship between sound intensity level and sound pressure level at any point depends on the characteristics of the source, the characteristics of the measurement environment, and the disposition of the measurement positions with respect to the source.

The procedures specified in ISO 3740 to ISO 3747 are not always applicable, for the following reasons.

a) Specific facilities are necessary if high precision is required. It is frequently not possible to install, and operate, large pieces of equipment in such facilities.

b) They cannot be used in the presence of high levels of extraneous noise generated by sources other than that under investigation.

0.2 This part of ISO 9614 specifies methods of determining the sound power levels of sources, within specific ranges of uncertainty, under test conditions which are less restricted than those required by ISO 3740 to ISO 3747.

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It is recommended that personnel performing sound intensity measurements according to this part of ISO 9614 are appropriately trained and experienced.

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0.3 This part of ISO 9614 complements ISO 9614-1, ISO 9614-2 and the ISO 3740 to ISO 3747 series, which specify various methods for the determination of sound power levels of machines and equipment. It differs from the ISO 3740 to ISO 3747 series principally in three aspects.

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a) Measurements are made of sound intensity as well as of sound pressure.

b) The uncertainty of the sound power level determined by the method specified in this part of ISO 9614 is classified according to the results of specified ancillary tests and calculations performed in association with the test measurements.

c) Current limitations of intensity measurement equipment which conforms to IEC 61043 restrict measurements to the one-third octave range 50 Hz to 6,3 kHz. Octave band and band-limited A-weighted values are determined from the constituent one-third-octave band values.

0.4 The integral over any surface totally enclosing the source of the scalar product of the sound intensity vector and the associated elemental area vector provides a measure of the sound power radiated directly into the air by all sources located within the enclosing surface and excludes sound radiated by sources located outside this surface. In practice, this exclusion is effective only if the source under test and other sources of extraneous intensity on the measurement surface are stationary over time. In the presence of sound sources operating outside the measurement surface, any system lying within the surface can absorb a proportion of energy incident upon it. The total sound power absorbed within the measurement surface will appear as a negative contribution to source power, and can produce an error in the sound power determination. In order to minimize the associated error, it is therefore necessary to remove any sound-absorbing material lying within the measurement surface which is not normally present during the operation of the source under test.

This method is based on sampling of the intensity normal to the measurement surface by moving an intensity probe continuously along specified paths. The resulting sampling error is a function of the spatial variation of the normal intensity component over the measurement surface, which depends on the directivity of the source, the chosen measurement surface, the pattern and speed of the probe scanning, and the proximity of extraneous sources outside the measurement surface.

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The accuracy of measurement of the normal component of sound intensity at a position is sensitive to the difference between the local sound pressure level and the local normal sound intensity level. A large difference can occur when the intensity vector at a measurement position is directed at a large angle (approaching 90°) to the local normal to the measurement surface. Alternatively, the local sound pressure level can contain strong contributions from sources outside the measurement surface, but can be associated with little net sound energy flow, as in a reverberant field in an enclosure; or the field can be strongly reactive because of the presence of the near field and/or standing waves.

The accuracy of determination of sound power level is adversely affected by a flow of sound energy into the volume enclosed by the measurement surface through a portion of that surface, even though it is, in principle, compensated by increased flow of the volume out through the remaining portion of the surface. This condition is caused by the presence of a strong extraneous source outside the measurement surface. This part of ISO 9614 limits such situations by giving relevant criteria.

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