

SLOVENSKI STANDARD
oSIST prEN ISO 11200:2012
01-september-2012

Akustika - Emisija hrupa naprav in opreme - Smernice za uporabo temeljnih standardov za ugotavljanje emisijske ravni zvočnega tlaka na mestu delovanja in na drugih opredeljenih mestih (ISO/DIS 11200:2012)

Acoustics - Noise emitted by machinery and equipment - Guidelines for the use of basic standards for the determination of emission sound pressure levels at a work station and at other specified positions (ISO/DIS 11200:2012)

Akustik - Geräuschabstrahlung von Maschinen und Geräten - Leitlinien zur Anwendung der Grundnormen zur Bestimmung von Emissions-Schalldruckpegeln am Arbeitsplatz und an anderen festgelegten Orten (ISO/DIS 11200:2012)

Acoustique - Bruit émis par les machines et équipements - Guide d'utilisation des normes de base pour la détermination des niveaux de pression acoustique d'émission au poste de travail et en d'autres positions spécifiées (ISO/DIS 11200:2012)

Ta slovenski standard je istoveten z: prEN ISO 11200

ICS:

17.140.20	Emisija hrupa naprav in opreme	Noise emitted by machines and equipment
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oSIST prEN ISO 11200:2012

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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prEN ISO 11200

May 2012

ICS 17.140.20

Will supersede EN ISO 11200:2009

English Version

**Acoustics - Noise emitted by machinery and equipment -
Guidelines for the use of basic standards for the determination
of emission sound pressure levels at a work station and at other
specified positions (ISO/DIS 11200:2012)**

Acoustique - Bruit émis par les machines et équipements -
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Geräten - Leitlinien zur Anwendung der Grundnormen zur
Bestimmung von Emissions-Schalldruckpegeln am
Arbeitsplatz und an anderen festgelegten Orten (ISO/DIS
11200:2012)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 211.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (prEN ISO 11200:2012) 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 DS.

This document is currently submitted to the parallel Enquiry.

This document will supersede EN ISO 11200:2009.

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 EU Directive(s).

Endorsement notice

The text of ISO/DIS 11200:2012 has been approved by CEN as a prEN ISO 11200:2012 without any modification.

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DRAFT INTERNATIONAL STANDARD ISO/DIS 11200

ISO/TC 43/SC 1

Secretariat: DS

Voting begins on
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Acoustics — Noise emitted by machinery and equipment — Guidelines for the use of basic standards for the determination of emission sound pressure levels at a work station and at other specified positions

Acoustique — Bruit émis par les machines et équipements — Guide d'utilisation des normes de base pour la détermination des niveaux de pression acoustique d'émission au poste de travail et en d'autres positions spécifiées

[Revision of first edition (ISO 11200:1995) and ISO 11200:1995/Cor.1:1997]

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ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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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 2.

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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 11200 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

This second edition cancels and replaces the first edition (ISO 11200:1995), which has been technically revised.

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Introduction

0.1 For many users of machinery and equipment the control of noise is a major issue which requires effective exchange of acoustical information among the several parties concerned. These include the manufacturer, installer and user of the machinery or equipment. This acoustical information is obtained from measurements. The main flow of information goes from the manufacturer to the user.

These measurements are useful only if the conditions under which they are carried out are specified, if they yield defined acoustical quantities, and if they are made using standardized instruments.

Two quantities which complement one another can be used to describe the sound emission of machinery or equipment: the sound power level and the emission sound pressure level at a specified position. The International Standards which describe the basic methods of determining the sound power level are ISO 3740 to ISO 3747 (determination from sound pressure level measurements) and ISO 9614-1 to ISO 9614-3 (determination from sound intensity measurements). This International Standard introduces a series of five International Standards describing various methods for determining emission sound pressure levels of machinery and equipment taking into account possible situations for the source under test (mobile machine, fixed machine, various test rooms, various instrumentations, different kinds of operator positions, etc.).

It is not the intent of this series of International Standards to describe procedures for measuring the occupational noise exposure of workers: see ISO 9612.

0.2 Emission sound pressure levels in conjunction with sound power levels are used for declaration of the noise emitted under the defined conditions, verification of declared values, comparison of the noise emitted by machinery of various types and sizes, comparison with limits specified in a purchasing contract or a regulation, engineering work to reduce the noise emission of machinery, and prediction of noise exposure at the specified positions.

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Included in this series of International Standards are three which describe procedures for measuring emission sound pressure levels directly, in different test environments (ISO 11201, ISO 11202 and ISO 11204), a fourth (ISO 11203) which gives procedures for determining emission sound pressure levels from the sound power level and a fifth (ISO 11205) which gives a procedure for determining the emission sound pressure level from measured values of the intensity level.

0.3 In general, these sound pressure levels are different from those that occur if the machinery or equipment operates in its installed surroundings, where the environment influences the sound pressure level at work stations or other specified positions. The selection of standards for the determination of the sound power level can, for practical reasons, have consequences on the selection of standards for the determination of the emission sound pressure level. It is preferable to make the choice of standards concurrently with respect to the two noise emission quantities.

0.4 For a particular family of machinery or equipment, noise test codes specify the method to be used for the determination of the sound power, the method to be used for the determination of emission sound pressure levels at work stations, and at other specified positions, the positions of the work stations, the mounting and operating conditions of the machine under test for the purpose of determining the noise emission quantities, the method to be used for verifying declared noise emission quantities. For drafting a noise test code, it is recommended to be familiar with ISO 3744.

0.5 The reasons for revising the series ISO 11201 to ISO 11205 were manifold:

- the need arose to introduce a Grade 1 method into the series in order to enhance the similarity with the ISO 3740 series of standards on the determination of sound power level;

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- feedback from experience with the use of the series showed that the ISO 11202 method gave more precise results than initially thought, hence the introduction into ISO 11202 of the possibility to get Grade 2 results;
- as source directivity plays a key role with regard to the emission sound pressure level, pragmatism led to introduce this parameter into the ISO 11202 and ISO 11204 methods;
- as measurement uncertainty was becoming a more and more central issue, the need arose to address the issue again in the light of the experience gained with the use of the ISO/IEC GUIDE 98-3.

No research was carried out in order to revise the series ISO 11201 to ISO 11205. Only existing knowledge was used.

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Acoustics — Noise emitted by machinery and equipment — Guidelines for the use of basic standards for the determination of emission sound pressure levels at a work station and at other specified positions

1 Scope

This International Standard is the frame standard introducing the series ISO 11201 to ISO 11205 of basic International Standards on the determination of emission sound pressure levels at work stations and other specified positions (ISO 11201 to ISO 11205). It is a guide aiming at:

- facilitating the writing of noise test codes;
- providing physical explanations on this noise emission quantity as compared to other noise quantities (4.1 to 4.3);
- comparing the different measurement methods offered by the series (Clause 5, Table 1);
- facilitating the choice of the most appropriate method(s) in typical practical situations (Clause 6).

This International Standard is largely based on flow-charts and tables. Case studies are described.

The guidance given applies only to airborne sound. It is for use in noise testing in general and in the preparation of noise test codes, in particular.

A standardized noise test code should select standards in the series ISO 11201 to ISO 11205 that are the most appropriate to the machinery family it covers, give detailed requirements on mounting and operating conditions for the particular family, as well as the location of the work station(s) and other specified positions as prescribed in these International Standards.

The data so obtained may be used for the declaration and verification of emission sound pressure levels e.g. as specified in ISO 4871.

2 Normative references

The following referenced documents are indispensable for the application 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 3740, *Acoustics — Determination of sound power levels of noise sources — Guidelines for the use of basic standards and for the preparation of noise test codes*

ISO 3741, *Acoustics — Determination of sound power levels of and sound energy levels of noise sources using sound pressure — Precision methods for reverberation test rooms*

ISO 3743-1, *Acoustics — Determination of sound power levels of and sound energy levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields — Part 1: Comparison method for a hard-walled test room*

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ISO 3743-2, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields — Part 2: Methods for special reverberation test rooms*

ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane*

ISO 3745, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Precision methods for anechoic rooms and hemi-anechoic rooms*

ISO 3746, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

ISO 3747, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering/survey methods for use in situ in a reverberant environment*

ISO 4871, *Acoustics — Declaration and verification of noise emission values of machinery and equipment*

ISO 9614-1, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurement at discrete points*

ISO 9614-2, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 2: Measurement by scanning*

ISO 9614-3, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 3: Precision method for measurement by scanning*

ISO 11201, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections*

ISO 11202, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections*

ISO 11203, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level*

ISO 11204, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections*

ISO 11205, *Acoustics — Noise emitted by machinery and equipment — Engineering method for the determination of emission sound pressure levels in situ at the work station and at other specified positions using sound intensity*

ISO 12001, *Acoustics — Noise emitted by machinery and equipment — Rules for the drafting and presentation of a noise test code*

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

IEC 60942, *Electroacoustics — Sound calibrators*

IEC 61043, *Electroacoustics — Instruments for the measurement of sound intensity — Measurement with pairs of pressure sensing microphones*

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.

3.1

emission

(acoustics) airborne sound radiated by a well-defined noise source (e.g. the machine under test)

NOTE Noise emission descriptors can be incorporated into a product label and/or product specification. The basic noise emission descriptors are the sound power level of the source itself and the emission sound pressure levels at a work station and/or at other specified positions (if any) in the vicinity of the source.

[ISO 11201:2010, 3.1]

3.2

emission sound pressure

p

sound pressure, at a work station or another specified position near a noise source, when the source is in operation under specified operating and mounting conditions on a reflecting plane surface, excluding the effects of background noise as well as the effects of reflections other than those from the plane or planes permitted for the purpose of the test

NOTE Emission sound pressure is expressed in pascals.

[ISO 11201:2010, 3.2]

3.3

emission sound pressure level

L_p

ten times the logarithm to the base 10 of the ratio of the square of the emission sound pressure, p , to the square of a reference value, p_0 , expressed in decibels

$$L_p = 10 \lg \frac{p^2}{p_0^2} \text{ dB} \quad (1)$$

where the reference value, p_0 , is 20 μPa

NOTE The emission sound pressure level is determined at a work station or another specified position in accordance with either a noise test code for a specific family of machines or, if no noise test code exists, one of the standards of the ISO 11200 to ISO 11205 series.

[ISO 11201:2010, 3.3]

3.4

time-averaged emission sound pressure level

$L_{p,T}$

ten times the logarithm to the base 10 of the ratio of the time average of the square of the emission sound pressure, p , during a stated time interval of duration, T (starting at t_1 and ending at t_2), to the square of a reference value, p_0 , expressed in decibels