

SLOVENSKI STANDARD
SIST EN ISO 3745:2012/oprA1:2015
01-april-2015

Akustika - Ugotavljanje ravni zvočnih moči in ravni zvočne energije virov hrupa z zvočnim tlakom - Precizijska metoda za gluhe in polgluhe prostore (ISO 3745:2012/DAM 1:2015)

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 3745:2012/DAM 1:2015)

Akustik - Bestimmung der Schalleistungs- und Schallenergiepegel von Geräuschquellen aus Schalldruckmessungen - Verfahren der Genauigkeitsklasse 1 für reflexionsarme Räume und Halbräume (ISO 3745:2012/DAM 1:2015)

Acoustique - Détermination des niveaux de puissance acoustique et des niveaux d'énergie acoustique émis par les sources de bruit à partir de la pression acoustique - Méthodes de laboratoire pour les salles anéchoïques et les salles semi-anéchoïques (ISO 3745:2012/DAM 1:2015)

Ta slovenski standard je istoveten z: EN ISO 3745:2012/prA1

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91.120.20	Akustika v stavbah. Zvočna izolacija	Acoustics in building. Sound insulation

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DRAFT AMENDMENT

ISO 3745:2012/DAM 1

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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

AMENDMENT 1

Acoustique — Détermination des niveaux de puissance acoustique et des niveaux d'énergie acoustique émis par les sources de bruit à partir de la pression acoustique — Méthodes de laboratoire pour les salles anéchoïques et les salles semi-anéchoïques

AMENDEMENT 1

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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.

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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
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Foreword

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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.

Amendment 1 to ISO 3745:2012 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

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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 - AMENDMENT 1

Page 1, 2 *Normative references*

Add the following reference:

ISO 26101:2012, *Acoustics — Test methods for the qualification of free-field environments*

ISO 26101:2012/Amd.1:—¹⁾, *Acoustics — Test methods for the qualification of free-field environments — Amendment 1*

Page 29, *Annex A*

Replace the whole text by the following:

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¹⁾ To be published.

Annex A (normative)

General procedures for qualification of anechoic and hemi-anechoic rooms

A.1 General

The performance of an anechoic or hemi-anechoic room is tested by comparing the spatial decrease of sound pressure emitted from a test sound source with the decrease of sound pressure that would occur in an ideal free sound field. The evaluation of this performance is based on the procedures outlined in ISO 26101:2012 and ISO 26101:2012/Amd.1:— on “Test methods for the qualification of free field environments”.

This annex contains the qualification criteria and test parameters which are required to qualify test rooms to the requirements of this International Standard. To conform to this International Standard, when no specific criteria are given, the requirements appropriate for sound power measurements in ISO 26101:2012 (as amended by ISO 26101:2012/Amd.1:—) shall be met.

A check of the room performance is recommended after modification of the room absorbers and periodically at intervals not exceeding 5 years.

Following is a comparison of this annex with ISO 26101:2012 and previous version of this annex:

- a) As in the previous version of ISO 3745:2012, Annex A, this annex requires that test rooms are qualified using discrete-frequency (e.g., pure tone) measurements unless it is known that the specific noise source under test radiates only broadband noise (see NOTE).
- b) Consistent with the wording in ISO 26101:2012 this annex defines methods for “discrete-frequency” and “broadband qualification” of test rooms. Discrete-frequency qualification is essentially identical to the pure tone qualification used in previous versions of this annex. In both cases only one pure tone is analysed in each frequency band in Table A.1. The wording change from “pure tone qualification” is consistent with improved analysis methods such as the use of pseudo random noise and narrow bandwidth analysis, see reference [37] and ISO 26101:2012, 5.1.4.1, 5.1.4.2.
- c) For the purposes of this International Standard, this annex does not require an evaluation of the position of the acoustic centre. In this annex, the term “acoustic centre” as originally used in ISO 3745 and ISO 26101:2012, is interpreted as (or, replaced by) either the mathematical origin of the microphone traverse (see A.3.3) or the primary sound radiating region of the test sound source.
- d) This annex follows ISO 26101:2012, 5.1.3.2 in that it requires the mathematical origin for evaluation of the inverse square law to be restricted to a point that lies within the physical volume occupied by the test sound source. This is a change from previous versions of this Annex, and as a result, a reduction of the qualified frequency range and/or qualified distances may arise in test rooms that were previously qualified using calculation methods that allowed large acoustic centre offsets.
- e) Based on guidance given in ISO 26101:2012, this annex requires different traverse paths than required in previous versions of Annex A of ISO 3745 (see A.3.3).
- f) Following the requirements in ISO 26101:2012, background noise limits, and requirements on the test sound source stability have been relaxed compared to previous versions of Annex A of ISO 3745.

NOTE The general qualification procedure and criteria in this annex are unchanged from the 2012 and 1975 versions of Annex A of ISO 3745. In particular, the default qualification method uses pure tones as a test signal (referred to as discrete frequency qualification in this annex). This is a significant difference from ISO 3745:2003, Annex A where the

default qualification procedure used a broadband signal. However, the qualification criteria (Table A.1) have remained the same in all versions of this annex. As a result, in a test room qualified using only broadband noise according to ISO 3745:2003, Annex A, the frequency range and/or distances over which the test room can be qualified may be reduced when re-tested using discrete frequency qualification.

A.2 Qualification criteria

A.2.1 General

In order for a space within an environment to be deemed anechoic or hemi-anechoic for measurements in accordance with this International Standard the following criteria and test parameters shall be used to qualify the test environment.

A.2.2 Maximum allowable deviations from inverse square law

The deviations of the measured sound pressure levels from those estimated using the inverse square law, obtained according to ISO 26101:2012, 5.1 (but excluding 5.1.6), shall not exceed the values given in Table A.1.

Table A.1 — Maximum allowable deviation of measured sound pressure levels from theoretical levels using the inverse square law

Type of test room	One-third-octave-band frequency in Hz	Allowable deviations in dB
Anechoic	≤ 630	+/- 1,5
	800 to 5 000	+/- 1,0
	≥ 6 300	+/- 1,5
Hemi-anechoic	≤ 630	+/- 2,5
	800 to 5 000	+/- 2,0
	≥ 6 300	+/- 3,0

A.2.3 Frequency range to be qualified

For measurements conducted in accordance with this International Standard, the frequency range of interest for qualification shall be at least 100 Hz to 10 000 Hz. The frequency range may be extended provided that the test environment and instrument specifications are satisfactory for use over the modified frequency range. Below 125 Hz and above 4 000 Hz, deviations from the inverse square law shall be evaluated in contiguous one-third-octave bands, and between 125 Hz and 4 000 Hz, these deviations shall be conducted at frequencies that correspond to the mid-band frequencies of contiguous octave bands (i.e. between 125 Hz and 4 000 Hz, not all one-third-octave bands need be evaluated).

If the frequency range is not at least 100 Hz to 10 000 Hz (see 3.11), measurements taken in this test room are not in full conformity with this International Standard. If the test room is qualified over a reduced frequency range, measurements may still be reported to be “in conformity” with this International Standard provided that:

- the one-third-octave bands comprising the reduced frequency range are contiguous;
- the report clearly states the reduced frequency range;
- the words “in full conformity with ISO 3745” are not used or implied.

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NOTE ISO 3745:2012, Annex B, provides an alternative qualification method that may be used for measurements of a specific noise source. However, the procedure in Annex B will not qualify the test room for general use with arbitrary noise sources.

A.2.4 Maximum qualified radius

The maximum qualified radius is the largest distance from the mathematical origin of the traverse over which the requirements in A.2.2 are met concurrently on all traverse paths in A.3.3 and at all frequencies in A.2.3. In the evaluation of this distance, any measured points on each traverse that lie outside the qualified radius may be excluded from consideration. Within each qualified radius, each microphone traverse shall meet the requirements for spatial resolution in A.4.3 in ISO 26101:2012, 5.1.4.3 and traverse length as amended by ISO 26101:2012/Amd.1:—.

For measurements to be conducted in full conformity with this International Standard, measurements shall be made on a measurement surface with radius less than or equal to the maximum qualified radius.

A.2.5 Properties of the reflecting plane in a hemi-anechoic room

The sound absorption coefficient of the reflecting plane shall not exceed 0,06 over the frequency range to be qualified.

NOTE A sealed concrete construction or a sealed lightweight construction with a surface density of 20 kg/m² or more, provided there are no significant air mass or structural resonances in the frequency range of interest, complies with the requirement.

The reflecting plane shall extend at least one-quarter wavelength and not less than 0,75 m, beyond the projection of the measurement surface on the plane at the lowest frequency of the frequency range to be qualified (A.2.3).

A.3 Installation of test sound sources and microphone traverses

A.3.1 Test sound source directionality requirements

The design or selection of the test source is the responsibility of the laboratory or acoustical expert performing the qualification. The test sound source shall meet the directionality requirements specified in ISO 26101:2012, Annex B. For the purpose of this International Standard, the directionality measurement can be performed in the anechoic or hemi-anechoic space that is being qualified. The required microphone positions are specified in ISO 26101:2012, B.3.2.

NOTE 1 It may facilitate the analysis if the test sound source is installed and evaluated in a different anechoic or hemi-anechoic space than the one being qualified (e.g. one known to have good free-sound-field properties over the frequency range of interest).

NOTE 2 Sound sources that can be suitable for use in qualification of anechoic and hemi-anechoic spaces are described in references [35]-[36] and in ISO 26101:2012.

A.3.2 Test sound source location

A.3.2.1 General

The test sound source shall be located to coincide with the usual position of the noise source under test. In an anechoic space, this is preferably in the centre of the test environment. In a hemi-anechoic space, this is preferably in the centre of and on the surface of the reflecting plane.

A.3.2.2 Test sound source location in hemi-anechoic room

The test sound source should be located on the plane of the reflecting floor, so that the radiating area of the test sound source is situated as close as possible to, but in any case should not be greater than 150 mm from,