SLOVENSKI STANDARD
SIST EN 60268-5:1999/A2:1999

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Sound system equipment -- Part 5: Loudspeakers (IEC 60268-5:1989/A2:1996)

Sound system equipment -- Part 5: Loudspeakers

Elektroakustische Geräte -- Teil 5: Lautsprecher

Equipements pour systèmes électroacoustiques -- Partie 5: Haut-parleurs

Ta slovenski standard je istoveten z: EN 60268-5:1996/A2:1996

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English version

Sound system equipment
Part 5: Loudspeakers
(IEC 268-5:1989/A2:1996)

Equipements pour systèmes électroacoustiques
Partie 5: Haut-parleurs
(CEI 268-5:1989/A2:1996)

Elektroakustische Geräte
Teil 5: Lautsprecher
(IEC 268-5:1989/A2:1996)

This amendment A2 modifies the European Standard EN 60268-5:1996; it was approved by CENELEC on 1996-07-02. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 Central Secretariat or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 100C/2/FDIS, future amendment 2 to IEC 268-5:1989, prepared by SC 100C, Equipment and systems in the field of audio, video and audiovisual engineering, of IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A2 to EN 60268-5:1996 on 1996-07-02.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-04-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1997-04-01

Endorsement notice

The text of amendment 2:1996 to the International Standard IEC 268-5:1989 was approved by CENELEC as an amendment to the European Standard without any modification.

NORME INTERNATIONALE
INTERNATIONAL STANDARD

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IEC
268-5

1989

AMENDEMENT 2
AMENDMENT 2

1996-07

Amendement 2

Equipements pour systèmes électroacoustiques

Partie 5: Haut-parleurs

Amendment 2

Sound system equipment

Part 5: Loudspeakers

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FOREWORD

This amendment has been prepared by subcommittee 100C: Equipment and systems in the field of audio, video and audiovisual engineering, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this amendment is based on the following documents:

FDIS	Report on voting
100C/2/FDIS	100C/24/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

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16.3.2 *Method of measurement of total Q factor Q_t*

In the definitions of the symbols below equation (1), replace the existing definitions of r_0 and r_1 by the following:

r_0 is the ratio of the maximum magnitude of the impedance, $|Z(j\omega)|_{max}$, at f_r to the d.c. resistance of the loudspeaker, R_{dc};

r_1 is the ratio of the magnitude $|Z(j\omega)|$ at f_1, f_2 to R_{dc}.

Replace the equation (2) by the following:

$$Q_t = \frac{\sqrt{f_1 f_2}}{\sqrt{r_0}\,(f_2 - f_1)}$$

Replace the text of note 1 by the following:

R_{dc} is the actual resistance to direct current of the voice-coil of the loudspeaker being measured.

16.4.2 *Method of measurement*

In the last line of item 1, replace "reflect" *by* "reflex".

In the last line of item 5, replace "interval" *by* "internal" .

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21.1 *Frequency response*

Add, after subclause 21.1.2 on page 43, the following new subclause:

21.1.3 *Measurement correction at low frequencies*

Where the low-frequency absorption characteristic of the anechoic chamber causes a deviation from free-field conditions, such that accurate measurement of free-field response is not possible down to the lower limit of the effective frequency range (see 21.2), the low-frequency measurement results may be corrected as follows.

a) The loudspeaker under test is removed from the chamber and replaced by a calibrated reference loudspeaker located such that its reference point and reference axis take the positions previously occupied by those of the loudspeaker under test.

The reference loudspeaker shall have substantially the same directional characteristics as the loudspeaker under test over the frequency range where correction is required, and its calibrated free-field frequency response shall extend to the lowest frequency of interest.

It is necessary to determine the frequency response of the reference loudspeaker accurately. For reference loudspeakers with limited low-frequency response (main resonance above 150 Hz), measurements in a very large anechoic room (8 m × 10 m × 12 m, for example) may be sufficiently accurate. For loudspeakers with extended low-frequency response, measurements on a tower (typically 10 m or more above ground level) in the open air are likely to be necessary.

NOTE – For measurement of the low-frequency response of a multi-unit loudspeaker system, the reference point is ideally the reference point of the bass unit.

b) The frequency response of the reference loudspeaker is measured using the same equipment and technique as for the loudspeaker under test (see 21.1.2).

c) Over the low-frequency range where the frequency response thus measured for the reference loudspeaker deviates from its known calibrated free-field response, the difference between the calibrated and measured responses is used to correct the measured response of the loudspeaker under test.

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23 Directional characteristics

Add, on page 51, after subclause 23.3.2, the following new subclause:

23.4 *Coverage angle(s)*

23.4.1 *Characteristic to be specified*

The angle, measured in a plane containing the reference axis, between the two directions on either side of the main lobe of the directional response pattern (see 23.1) measured with octave band noise centred on a specified frequency, at which the sound pressure level is 6 dB less than that at the direction of maximum level.

For loudspeakers which are designed to have different coverage angles in different planes through the reference axis, coverage angles shall be specified in at least two orthogonal planes (see 23.2.2, item 3).

23.4.2 *Method of measurement*

1) The coverage angle(s) is(are) deduced from the directional response pattern(s) measured with octave band noise centred on 4 kHz, if the effective frequency range of the loudspeaker includes both 2,8 kHz and 5,7 kHz (half an octave above and below 4 kHz).

If the effective frequency range does not include the octave band centred on 4 kHz, the coverage angle(s) shall be deduced from measurements in an octave band of specified centre frequency, near the upper limit of the effective frequency range.

The coverage angle(s) may, in addition, be specified for other centre frequencies of octave bands.

The centre frequency or frequencies used for the measurements shall be presented with the measured data.

2) The values may be presented as a table or as a diagram.

23.4.3 *Relation between the coverage angle and the directivity index*

An approximate relation between the coverage angles and the directivity index in the same octave band is given by:

$$D_i = 180/\arcsin\{\sin(A/2)\sin(B/2)\}$$

where A and B are the coverage angles in degrees in two orthogonal planes.

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24.2 *Total harmonic distortion*

Replace the title of subclause 24.2.2 by the following new title:

24.2.2 *Method of measurement for input voltages up to the rated sinusoidal voltage*

Add, after subclause 24.2.2, the following new subclause:

24.2.3 *Method of measurement for input voltages higher than the rated sinusoidal voltage*

24.2.3.1 The loudspeaker is brought under free-field conditions for loudspeaker systems and in half-space free-field conditions for loudspeaker drive units.

A series of tone burst input voltages with increasing frequencies are supplied to the loudspeaker. Each tone burst shall be long enough for the steady-state response to be achieved. Its amplitude shall be chosen to be not larger than the short-term maximum input voltage (see 17.1). The frequencies are usually produced by a step-by-step method.

24.2.3.2 A measuring microphone is situated at 1 m distance from the reference point, unless otherwise specified.

24.2.3.3 A sampling-processing system is used to sample the tone burst response, received by the measuring microphone. The sampling frequency shall be high enough to enable the highest harmonic of interest. To eliminate zero-crossing errors, either the sampling instants shall be coincident with the zero-crossings of the tone burst signal, or the microphone signals should be windowed (a Hanning window is usually suitable). The system calculates the spectrum from the data of one or more cycles in order to obtain the fundamental P_t and the separate harmonics P_{nf}.

24.2.3.4 The total harmonic distortion at input voltages higher than the rated sinusoidal voltage shall then be determined by the formula given in item 6 of 24.2.2.

24.2.3.5 The harmonic distortion components of the second and third orders at input voltages higher than the rated sinusoidal input voltage shall be determined by the formula given in 24.3.2.6.

24.2.3.6 The following data shall be given with the results of the measurement:

– input voltage and sound pressure level referred to 1 m;
– discrete frequencies at which measurements were made;
– distance of the measuring microphone to the reference point if this differs from 1 m;
– conditions of measurement (free-field or half-space free-field).

24.3 *Harmonic distortion of the n^{th} order* (where n = 2 or 3)

Replace the title of subclause 24.3.2 by the following new title:

24.3.2 *Method of measurement for input voltages up to the rated sinusoidal voltage*

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24.6.2 *Method of measurement*

Replace the third and fourth sentences (from "The input voltages chosen..." *to* "...important information.") *by the following:*

The input voltages chosen are those which are the most relevant for the intended use and should include but not exceed the rated noise voltage (see 17.4). The one-third octave