

Sound system equipment - Part 21: Acoustical  
(output-based) measurements

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 60268-21:2018 sisaldab Euroopa standardi EN IEC 60268-21:2018 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 60268-21:2018 consists of the English text of the European standard EN IEC 60268-21:2018.
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ICS 33.160.01

English Version

**Sound system equipment - Part 21: Acoustical (output-based)  
measurements  
(IEC 60268-21:2018)**

Équipements pour systèmes électroacoustiques - Partie 21  
: Mesures acoustiques (en sortie)  
(IEC 60268-21:2018)

Elektroakustische Geräte - Teil 21:  
Akustische(Ausgabebasierte) Messungen  
(IEC 60268-21:2018)

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## European foreword

The text of document 100/2957/CDV, future edition 1 of IEC 60268-21, prepared by IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60268-21:2018.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2019-09-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-12-12

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60268-7:2010	NOTE	Harmonized as EN 60268-7:2011 (not modified)
IEC 62777	NOTE	Harmonized as EN 62777

## Annex ZA

(normative)

### Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60263	-	Scales and sizes for plotting frequency characteristics and polar diagrams	-	-
IEC 60268-1	-	Sound system equipment. Part 1: General	HD 483.1 S2	-
IEC 60268-2	1987	Sound system equipment. Part 2: Explanation of general terms and calculation methods	HD 483.2 S2	1993
IEC 61094-4	-	Measurement microphones - Part 4: Specifications for working standard microphones	EN 61094-4	-
IEC 61260-1	-	Electroacoustics - Octave-band and fractional-octave-band filters - Part 1: Specifications	EN 61260-1	-
ISO 3	-	Preferred numbers - Series of preferred numbers	-	-
ISO 3741	2010	Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for reverberation test rooms	EN ISO 3741	2010
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	EN ISO 3744	-
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	EN ISO 3745	-
CTA 2034-A	-	Standard Method of Measurement for In-Home Loudspeakers, Consumer Technology Association (Formerly CEA)	-	-
CTA 2010-B	-	Standard Method of Measurement for Powered Subwoofers, standard by Consumer Technology Association (Formerly CEA)	-	-

## CONTENTS

FOREWORD.....	8
INTRODUCTION.....	10
1 Scope.....	11
2 Normative references .....	11
3 Terms, definitions and abbreviated terms .....	12
3.1 Terms and definitions.....	12
3.2 Abbreviated terms.....	12
4 Type description .....	12
5 Physical characteristics .....	12
5.1 Marking of terminals and controls .....	12
5.2 Dimensions.....	12
5.3 Mass.....	12
5.4 Connectors and cable assemblies.....	13
6 Design data .....	13
7 Conditions .....	13
7.1 Rated conditions .....	13
7.2 Climatic conditions.....	13
7.3 Normal measuring conditions.....	13
8 Test signals .....	14
8.1 General.....	14
8.2 Sinusoidal chirp .....	14
8.3 Steady-state single-tone signal .....	15
8.4 Steady-state two-tone signal.....	15
8.5 Sparse multi-tone complex.....	15
8.6 Broadband noise signal.....	16
8.7 Narrow-band noise signal .....	16
8.8 Hann-burst signal.....	16
8.9 Impulsive signal .....	17
9 Acoustical environment.....	17
9.1 General.....	17
9.2 Free-field conditions .....	17
9.3 Half-space, free-field conditions.....	17
9.4 Simulated free-field conditions .....	17
9.5 Half-space simulated free-field conditions .....	17
9.6 Diffuse sound field conditions .....	18
9.7 Target application conditions .....	18
10 Positioning of the DUT.....	18
10.1 Rated geometrical conditions .....	18
10.1.1 General .....	18
10.1.2 Reference plane and normal vector .....	18
10.1.3 Reference point .....	18
10.1.4 Reference axis .....	19
10.1.5 Orientation vector .....	19
10.1.6 Evaluation point.....	19
10.1.7 Evaluation distance .....	19

10.2	Measuring distance between DUT and microphone .....	20
10.2.1	Far-field conditions .....	20
10.2.2	Near-field conditions .....	20
10.2.3	Diffuse field conditions .....	20
10.2.4	Target application condition .....	21
11	Measurement equipment and test results .....	21
12	Accuracy of the acoustical measurement .....	21
12.1	General .....	21
12.2	Measurement uncertainty .....	21
13	Mounting of the DUT .....	22
13.1	Mounting and acoustic loading of drive units .....	22
13.2	Mounting and acoustic loading of an electro-acoustic system .....	22
14	Preconditioning .....	23
15	Rated ambient conditions .....	23
15.1	Temperature ranges .....	23
15.1.1	Performance limited temperature range .....	23
15.1.2	Damage limited temperature range .....	23
15.2	Humidity ranges .....	23
15.2.1	Relative humidity range .....	23
15.2.2	Damage limited humidity range .....	23
16	Rated frequency range .....	23
17	Input signal .....	23
17.1	Rated maximum input value .....	23
17.1.1	Condition to be specified .....	23
17.1.2	Direct measurement .....	24
17.1.3	Indirect measurement based on $SPL_{max}$ .....	25
17.2	Maximum input level .....	25
18	Sound-pressure output .....	26
18.1	Rated maximum sound pressure .....	26
18.1.1	Conditions to be specified .....	26
18.1.2	Direct measurement .....	26
18.1.3	Indirect measurement based on maximum input value .....	27
18.2	Rated maximum sound-pressure level .....	27
18.3	Short term maximum sound pressure level .....	27
18.3.1	Conditions to be specified .....	27
18.3.2	Method of measurement .....	28
18.4	Long term maximum sound pressure level .....	28
18.4.1	Conditions to be specified .....	28
18.4.2	Method of measurement .....	29
18.5	Sound pressure in a stated frequency band .....	29
18.5.1	Condition to be specified .....	29
18.5.2	Method of measurement .....	29
18.6	Sound-pressure level in a stated frequency band .....	30
18.7	Mean sound-pressure in a stated frequency range .....	30
18.7.1	Condition to be specified .....	30
18.7.2	Method of measurement .....	30
18.8	Mean sound-pressure level in a stated frequency range .....	30

19	Frequency response of the fundamental component .....	30
19.1	Transfer function .....	30
19.1.1	Conditions to be specified .....	30
19.1.2	Method of measurements .....	30
19.2	SPL frequency response .....	32
19.2.1	Conditions to be specified .....	32
19.2.2	Method of measurement .....	32
19.3	Time-varying amplitude compression of the fundamental component .....	33
19.3.1	General .....	33
19.3.2	Method of measurement .....	33
19.4	Amplitude compression at maximum input .....	33
19.4.1	Short term amplitude compression .....	33
19.4.2	Method of measurement .....	33
19.4.3	Long-term amplitude compression .....	34
19.4.4	Method of measurement .....	34
19.5	Corrections based on a free-field reference measurement .....	34
19.5.1	General .....	34
19.5.2	Correction of the measured sound pressure signal .....	34
19.5.3	Correction of the amplitude response .....	35
19.6	Effective frequency range .....	36
19.6.1	Conditions to be specified .....	36
19.6.2	Method of measurement .....	36
19.7	Internal latency .....	36
19.7.1	Conditions to be specified .....	36
19.7.2	Methods of measurement .....	36
20	Directional characteristics .....	37
20.1	General .....	37
20.2	Direct sound field in 3D space .....	37
20.2.1	Directional transfer function .....	37
20.2.2	Extrapolated far-field data .....	37
20.2.3	Parameters of the holographic sound field expansion .....	38
20.2.4	Extrapolated near-field data .....	39
20.3	Directional far field characteristics .....	39
20.3.1	Directional factor .....	39
20.3.2	Directional gain .....	41
20.3.3	Directivity factor .....	41
20.3.4	Directivity index .....	41
20.4	Acoustic output power .....	42
20.4.1	Conditions to be specified .....	42
20.4.2	Methods of measurement .....	42
20.5	Sound power level .....	44
20.6	Mean acoustic output power in a frequency band .....	44
20.6.1	Conditions to be specified .....	44
20.6.2	Method of measurement .....	44
20.7	Radiation angle .....	44
20.7.1	Conditions to be specified .....	44
20.7.2	Method of measurement .....	44



20.8	Coverage angle or angles .....	45
20.8.1	Conditions to be specified .....	45
20.8.2	Method of measurement .....	45
20.9	Mean sound pressure level in an acoustical zone .....	45
20.9.1	General .....	45
20.9.2	Method of measurement .....	45
21	Harmonic distortion .....	46
21.1	General .....	46
21.2	$N^{\text{th}}$ -order harmonic component .....	46
21.2.1	Conditions to be specified .....	46
21.2.2	Method of measurement .....	46
21.3	Total harmonic components .....	47
21.3.1	Conditions to be specified .....	47
21.3.2	Method of measurement .....	47
21.4	Total harmonic distortion .....	47
21.4.1	Conditions to be specified .....	47
21.4.2	Method of measurement .....	47
21.5	Higher-order harmonic distortion .....	48
21.5.1	Conditions to be specified .....	48
21.5.2	Method of measurement .....	48
21.6	Maximum sound pressure level limited by total harmonic distortion .....	49
21.6.1	Conditions to be specified .....	49
21.6.2	Method of measurement .....	49
21.7	$N^{\text{th}}$ -order equivalent input harmonic distortion component .....	50
21.7.1	Conditions to be specified .....	50
21.7.2	Method of measurement .....	50
21.8	Equivalent input total harmonic distortion .....	51
21.8.1	Conditions to be specified .....	51
21.8.2	Method of measurement .....	51
22	Two-tone distortion .....	52
22.1	Variation of excitation frequencies .....	52
22.2	Modulation distortion .....	52
22.2.1	Conditions to be specified .....	52
22.2.2	Method of measurement .....	52
22.3	Amplitude modulation distortion .....	53
22.3.1	Conditions to be specified .....	53
22.3.2	Method of measurement .....	54
23	Multi-tone distortion .....	54
23.1	Conditions to be specified .....	54
23.2	Method of measurement .....	55
24	Impulsive distortion .....	55
24.1	Impulsive distortion level .....	55
24.1.1	Conditions to be specified .....	55
24.1.2	Method of measurement .....	56
24.2	Maximum impulsive distortion ratio .....	56
24.2.1	Conditions to be specified .....	56
24.2.2	Method of measurement .....	56

24.3	Mean impulsive distortion level .....	57
24.3.1	Conditions to be specified .....	57
24.3.2	Method of measurement .....	57
24.4	Crest factor of impulsive distortion .....	57
24.4.1	Conditions to be specified .....	57
24.4.2	Method of measurement .....	57
25	Stray magnetic fields .....	58
25.1	General .....	58
25.2	Static component .....	58
25.2.1	Characteristic to be specified .....	58
25.2.2	Method of measurement .....	58
25.3	Dynamic components .....	59
25.3.1	Characteristics to be specified .....	59
25.3.2	Method of measurement .....	59
Annex A (informative) Uncertainty analysis .....		60
Annex B (normative) Transducer mounting .....		62
B.1	Standard baffle .....	62
B.2	Standard measuring enclosures .....	64
B.2.1	General .....	64
B.2.2	Type A .....	64
B.2.3	Type B .....	64
Annex C (normative) Simulated programme signal .....		66
Annex D (informative) Rating the maximum input and output values .....		68
Annex E (informative) Spherical wave expansion .....		70
E.1	Coefficients of spherical wave expansion .....	70
E.2	Directional factor .....	70
E.3	Directivity factor .....	71
E.4	Acoustic output power .....	71
Annex F (informative) Non-linearity .....		72
F.1	Equivalent harmonic input distortion .....	72
F.2	Two-tone intermodulation .....	72
F.3	Signal distortion generated in audio systems .....	73
Annex G (informative) Stray magnetic field .....		75
Bibliography .....		76

Figure 1	– Rated conditions used to describe the position of the DUT in the coordinate system .....	18
Figure 2	– Recommended position and orientation of the DUT .....	19
Figure 3	– Valid region of expansion of the sound pressure $p(r)$ at the observation point $r$ at the distance $r > a$ .....	39
Figure 4	– Measurement of the distortion generated by a multi-tone stimulus .....	55
Figure 5	– Measurement of impulsive distortion .....	56
Figure A.1	– Relationship between tolerance limits, corresponding acceptance intervals and the maximum permitted uncertainty of measurement, $U_{MAX}$ .....	60
Figure B.1	– Standard baffle, dimensions .....	62
Figure B.2	– Standard baffle with chamfer .....	63
Figure B.3	– Standard baffle with sub-baffle .....	63

Figure B.4 – Standard measuring enclosure type A (net volume is about 600 l) .....	64
Figure B.5 – Standard measuring enclosure type B (net volume is about 450 l) .....	65
Figure C.1 – Block diagram of test setup for generating the simulated noise signal used for testing passive loudspeaker systems comprising a network filter .....	66
Figure F.1 – Signal flow chart of the electro-acoustical system .....	72
Figure F.2 – Variation of the frequencies of the two-tone stimulus in the intermodulation measurement .....	73
Figure F.3 – Generation of the signal distortion in audio systems .....	73
Figure G.1 – Measuring apparatus for stray magnetic field .....	75
Table A.1 – Example uncertainty budget – acoustical loudspeaker evaluation .....	61
Table C.1 – Power spectrum of simulated programme signal in 1/3 octave bands rated .....	67

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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## SOUND SYSTEM EQUIPMENT –

### Part 21: Acoustical (output-based) measurements

#### FOREWORD

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International Standard IEC 60268-21 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

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

CDV	Report on voting
100/2957/CDV	100/3019/RVC

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60628, published under the general title *Sound system equipment*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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## INTRODUCTION

Loudspeakers, headphones and other actuators have become more versatile and, as a result, new measurement techniques are required to evaluate these systems. The following is a list of examples where new measurement techniques are required:

- Limited access to the electrical terminals of the transducer  
The higher integration of electrical, acoustical and mechanical elements limit the access to the electrical terminals of the transducer.
- Analogue or digital audio input signals  
Audio inputs can accept analogue or digital signals in various formats.
- Latency and other kinds of distortion associated with digital signal processing  
Digital signal processing is used to correct the transfer behaviour of the passive system and to generate a desired sound output and as a result, latency and other kinds of distortion not found in analogue equipment can be generated.
- Excessive equalization  
Excessive equalization can force the transducer to operate in the large signal domain causing thermal and nonlinear effects.
- Active protection  
Active protection attenuates the input signal to prevent a mechanical and thermal overload of the transducer and other components.
- Other transducer principles  
Although most loudspeaker systems use a moving coil in an electro-dynamical transducer, there is a need to expand the application to electro-static, electro-magnetic or any other transduction principles.
- Other mechanical and acoustical elements  
To improve sound radiation, vented enclosures, sealed enclosures, passive radiators, horns, wave guides, flat panels, and other mechanical and acoustical elements are implemented.
- Impulsive distortions  
Defects in manufacturing (e.g. voice coil rubbing) or operating under overload conditions can create impulsive distortions, which have a high impact on perceived sound quality but cannot be detected by conventional measurements (e.g. total harmonic distortion).
- Directional characteristics and complex near field properties  
The comprehensive evaluation of professional equipment, including directional characteristics, can be realized by considering the complex near-field properties as a supplement to the existing far-field measurement techniques. In addition, devices intended for use in the near field, such as hand-held personal audio devices (e.g. laptops, tablets, smart phones) and other portable sound systems, need to be evaluated in a manner appropriate to their intended use.

## SOUND SYSTEM EQUIPMENT –

### Part 21: Acoustical (output-based) measurements

#### 1 Scope

This part of IEC 60268 specifies an acoustical measurement method that applies to electro-acoustical transducers and passive and active sound systems, such as loudspeakers, TV-sets, multi-media devices, personal portable audio devices, automotive sound systems and professional equipment. The device under test (DUT) can be comprised of electrical components performing analogue and digital signal processing prior to the passive actuators performing a transduction of the electrical input into an acoustical output signal. This document describes only physical measurements that assess the transfer behaviour of the DUT between an arbitrary analogue or digital input signal and the acoustical output at any point in the near and far field of the system. This includes operating the DUT in both the small and large signal domains. The influence of the acoustical boundary conditions of the target application (e.g. car interior) can also be considered in the physical evaluation of the sound system. This document does not assess the perception and cognitive evaluation of the reproduced sound and the impact of perceived sound quality.

NOTE Some measurement methods defined in this document can be applied to headphones, headsets, earphones and earsets in accordance with [1]<sup>1</sup>. This document does not apply to microphones and other sensors. This document does not require access to the state variables (voltage, current) at the electrical terminals of the transducer. Sensitivity, electric input power and other characteristics based on the electrical impedance will be described in a separate future standard document, IEC 60268-22, dedicated to electrical and mechanical measurements.

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60263, *Scales and sizes for plotting frequency characteristics and polar diagrams*

IEC 60268-1, *Sound system equipment – Part 1: General*

IEC 60268-2:1987, *Sound system equipment – Part 2: Explanation of general terms and calculation methods*

IEC 61094-4, *Measurement microphones – Part 4: Specifications for working standard microphones*

IEC 61260-1, *Electroacoustics – Octave-band and fractional-octave-band filters – Part 1: Specifications*

ISO 3, *Preferred numbers – Series of preferred numbers*

ISO 3741:2010, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Precision methods for reverberation test rooms*

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<sup>1</sup> Numbers in square brackets refer to the Bibliography.