

SLOVENSKI STANDARD

SIST EN 60704-1:2010

01-september-2010

Nadomešča:

SIST EN 60704-1:2001

Gospodinjski in podobni električni aparati - Postopek preskušanja za ugotavljanje zvočnega hrupa v zraku - 1. del: Splošne zahteve (IEC 60704-1:2010)

Household and similar electrical appliances - Test code for the determination of airborne noise - Part 1: General requirements (IEC 60704-1:2010)

Elektrische Geräte für den Hausgebrauch und ähnliche Zwecke - Prüfvorschrift für die Bestimmung der Luftschallemission - Teil 1: Allgemeine Anforderungen (IEC 60704-1:2010)

Appareils électrodomestiques et analogues - Code d'essai pour la détermination du bruit aérien - Partie 1: Règles générales (CEI 60704-1:2010)

Ta slovenski standard je istoveten z: EN 60704-1:2010

ICS:

17.140.20	Emisija hrupa naprav in opreme	Noise emitted by machines and equipment
97.030	Električni aparati za dom na splošno	Domestic electrical appliances in general

SIST EN 60704-1:2010

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60704-1:2010

<https://standards.iteh.ai/catalog/standards/sist/01aab8cc-4d85-4d0a-b707-0cf4cdc77354/sist-en-60704-1-2010>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60704-1

March 2010

ICS 13.120;97.170

Supersedes EN 60704-1:1997

English version

**Household and similar electrical appliances -
Test code for the determination of airborne noise -
Part 1: General requirements
(IEC 60704-1:2010)**

Appareils électrodomestiques
et analogues -
Code d'essai pour la détermination
du bruit aérien -
Partie 1: Règles générales
(CEI 60704-1:2010)

Elektrische Geräte für den Hausgebrauch
und ähnliche Zwecke -
Prüfvorschrift für die Bestimmung
der Luftschallemission -
Teil 1: Allgemeine Anforderungen
(IEC 60704-1:2010)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This European Standard was approved by CENELEC on 2010-03-01. CENELEC 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.

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 European Standard 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 59/546/FDIS, future edition 3 of IEC 60704-1, prepared by IEC TC 59, Performance of household and similar electrical appliances, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60704-1 on 2010-03-01.

This standard supersedes EN 60704-1:1997. It constitutes an update and an editorial revision. It also includes the description of an appropriate test enclosure for appliances to be built in.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2010-12-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2013-03-01 |

Annex ZA has been added by CENELEC.

iTeh STANDARD PREVIEW Endorsement notice (standards.iteh.ai)

The text of the International Standard IEC 60704-1:2010 was approved by CENELEC as a European Standard without any modification.

[SIST EN 60704-1:2010](http://standards.iteh.ai/catalog/standards/sist/en-60704-1-2010)

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

- | | | |
|-----------------|------|--|
| ISO 9614-1:1993 | NOTE | Harmonized as EN ISO 9614-1:2009 (not modified). |
| ISO 9614-2:1996 | NOTE | Harmonized as EN ISO 9614-2:1996 (not modified). |

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60038	2009	IEC standard voltages	-	-
IEC 60704-3	2006	Household and similar electrical appliances - Test code for the determination of airborne acoustical noise - Part 3: Procedure for determining and verifying declared emission values	EN 60704-3	2006
IEC 61260	1995	Electroacoustics - Octave-band and fractional-octave-band filters	EN 61260	1995
IEC 61672-1	2002	Electroacoustics - Sound level meters - Part 1: Specifications	EN 61672-1	2003
ISO 3741	1999	Acoustics - Determination of sound power levels of noise sources using sound pressure - Precision methods for reverberation rooms	-	-
ISO 3743-1	1994	Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering methods for small, movable sources in reverberant fields - Part 1: Comparison method for hard-walled test rooms	-	-
ISO 3743-2	1994	Acoustics - Determination of sound power levels of noise sources - Engineering methods for small, movable sources in reverberant fields using sound pressure - Part 2: Methods for special reverberation test rooms	-	-
ISO 3744	1994	Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free field over a reflecting plane	-	-
ISO 3745	2003	Acoustics - Determination of sound power levels of noise sources using sound pressure - Precision methods for anechoic and hemi-anechoic rooms	-	-
ISO 6926	1990	Acoustics - Determination of sound power levels of noise sources - Requirements for the performance and calibration of reference sound sources	-	-
ISO 12001	1996	Acoustics - Noise emitted by machinery and equipment - Rules for the drafting and presentation of a noise test code	-	-

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60704-1:2010

<https://standards.iteh.ai/catalog/standards/sist/01aab8cc-4d85-4d0a-b707-0cf4cdc77354/sist-en-60704-1-2010>



IEC 60704-1

Edition 3.0 2010-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Test code for the determination of
airborne acoustical noise –
Part 1: General requirements

Appareils électrodomestiques et analogues – Code d'essai pour la détermination
du bruit aérien –
Partie 1: Exigences générales

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX



ICS 13.120; 97.170

ISBN 2-8318-1080-5

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope and object.....	7
1.1 Scope.....	7
1.1.1 General.....	7
1.1.2 Types of noise.....	7
1.1.3 Size of the source.....	7
1.2 Object.....	7
1.3 Measurement uncertainty.....	8
2 Normative references.....	8
3 Terms and definitions.....	9
4 Measurement methods and acoustical environments.....	10
4.1 General.....	10
4.2 Direct method.....	10
4.3 Comparison method.....	11
4.4 Acoustical environments.....	11
4.4.1 General requirements and criterion for adequacy of the test environment.....	11
4.4.2 Criterion for background noise level.....	11
4.4.3 Environmental conditions.....	12
5 Instrumentation.....	12
5.1 Instrumentation for measuring acoustical data.....	12
5.2 Instrumentation for measuring climatic conditions.....	12
5.3 Instrumentation for measuring operating conditions.....	12
6 Operation and location of appliances under test.....	12
6.1 Equipping and pre-conditioning of appliances.....	12
6.2 Supply of electric energy and of water or gas.....	13
6.3 Climatic conditions.....	13
6.4 Loading and operating of appliances during tests.....	14
6.5 Location and mounting of appliances.....	14
7 Measurement of sound pressure levels.....	16
7.1 Microphone array, measurement surface and RSS location for essentially free field conditions over reflecting plane(s).....	16
7.2 Microphone array and RSS location in hard-walled test rooms.....	18
7.3 Microphone array and RSS location in special reverberation test rooms.....	18
7.4 Measurements.....	19
8 Calculation of sound pressure and sound power levels.....	19
8.1 General.....	19
8.2 Corrections for background noise levels.....	20
8.3 Corrections for the test environment.....	20
8.4 Calculation of sound pressure level averaged over the microphone positions.....	20
8.5 Calculation of sound power levels with the comparison method.....	21
8.6 Calculation of sound power levels in free field conditions over a reflecting plane.....	21
8.7 Calculation of A-weighted sound power level with the direct method in special reverberation test rooms.....	21

9	Information to be recorded.....	22
9.1	General data	22
9.2	Description of appliance under test	22
9.3	Measurement method	22
9.4	Acoustical test environment.....	22
9.5	Instrumentation	23
9.6	Equipment and pre-conditioning of appliance under test.....	23
9.7	Electric supply, water supply, etc.	23
9.8	Climatic conditions	23
9.9	Operation of the appliance under test.....	23
9.10	Location and mounting of the appliance under test	23
9.11	Microphone array	23
9.12	Measurement data.....	24
9.13	Calculated sound pressure and sound power levels	24
10	Information to be reported	24
10.1	General data 9.1	24
10.2	Appliance under test 9.2.....	24
10.3	Test conditions for the appliance	25
10.4	Acoustical data.....	25
	Annex A (normative) Standard test table.....	31
	Annex B (normative) Test enclosure	32
	Annex C (informative) Guidelines for the design of simple test rooms with essentially free field conditions	33
	Bibliography.....	34
	Figure 1 – Measurement surface – parallelepiped – with key microphone positions, for floor free-standing appliances	26
	Figure 2 – Measurement surface – parallelepiped – with key microphone positions, for floor standing appliances placed against a wall.....	26
	Figure 3 – Measurement surface – parallelepiped – with key microphone positions, for high floor-standing appliances placed against a wall	27
	Figure 4 – Measurement surface – hemisphere – with key microphone positions, for hand-held, table type and floor-treatment appliances	28
	Figure 5 – Measurement surface – quarter-sphere – with key microphone positions, for small floor-standing appliances placed against a wall	29
	Figure 6 – Measurement surface – parallelepiped – with five or nine microphone positions for stand-type appliances	30
	Figure A.1 – Example of standard test table.....	31
	Figure B.1 – Test enclosure	32

<https://standards.iteh.ai/catalog/standards/sist/01aab8cc-4d85-4d0a-b707-0c24cdc77354/sist-en-60704-1-2010>
 SIST EN 60704-1:2010

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
TEST CODE FOR THE DETERMINATION
OF AIRBORNE ACOUSTICAL NOISE –**

Part 1: General requirements

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60704-1 has been prepared by IEC technical committee 59: Performance of household and similar electrical appliances.

This third edition cancels and replaces the second edition published in 1997 and constitutes an update and an editorial revision. It also includes the description of an appropriate test enclosure for appliances to be built in.

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

FDIS	Report on voting
59/546/FDIS	59/549/RVD

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

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

A list of all the parts in the IEC 60704 series, under the general title *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise*, can be found on the IEC website.

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

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

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 60704-1:2010

<https://standards.iteh.ai/catalog/standards/sist/01aab8cc-4d85-4d0a-b707-0cf4cdc77354/sist-en-60704-1-2010>

INTRODUCTION

Although the noise emitted by household appliances does not generally present a hazard to the hearing of the operator and other exposed persons, the need for standardization procedures for the determination of the noise emitted has been recognized for a long time. Such procedures should be specified, not only for special types of appliances, but also the principles should be applicable to the majority of appliances in general use.

Generally, the determination of noise levels is only part of a comprehensive testing procedure covering many aspects of the properties and performances of the appliance. It is therefore important that the requirements for noise measurements (such as test environment, instrumentation, and amount of labour involved) should be kept at a modest level.

The results of noise measurements will be used for many purposes, for example for noise declaration, as well as for comparing the noise emitted by a specific appliance to the noise emitted by other appliances of the same family. In other cases, the results will be taken as a basis for engineering action in the development stages of new pieces of equipment, or in deciding on means for sound insulation. For all purposes, it is important to specify procedures with known accuracy so that the results of measurements taken by different laboratories can be compared.

These conditions have, as far as possible, been taken into account in the preparation of this test code. The acoustic measuring methods are based on those described in ISO 3743-1, ISO 3743-2 and ISO 3744.

The adoption of these methods permits the use of semi-anechoic rooms, special reverberation test rooms and hard-walled test rooms. The result of the measurements is the sound power level of the appliance. Within the measuring uncertainty specific to these methods, the results from the determination under free field conditions over a reflecting plane are equal to those obtained in reverberant fields. The use of intensity methods as described in ISO 9614-1 and ISO 9614-2 is subject to a specific part 2. Part 2: 354/sist-en-60704-1-2010

It should be emphasized that this test code is concerned with airborne noise only. In some cases, structure-borne noise, for example transmitted to the adjoining room, may be of importance.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – TEST CODE FOR THE DETERMINATION OF AIRBORNE ACOUSTICAL NOISE –

Part 1: General requirements

1 Scope and object

1.1 Scope

1.1.1 General

This part of IEC 60704 applies to electric appliances (including their accessories or components) for household and similar use, supplied from mains or from batteries.

By similar use is understood the use in similar conditions as in households, for example in inns, coffee-houses, tea-rooms, hotels, barber or hairdresser shops, laundrettes, etc., if not otherwise specified in part 2.

This standard does not apply to

- appliances, equipment or machines designed exclusively for industrial or professional purposes;
- appliances which are integrated parts of a building or its installations, such as equipment for air conditioning, heating and ventilating (except household fans, cooker hoods and free standing heating appliances), oil burners for central heating, pumps for water supply and for sewage systems;
- separate motors or generators;
- appliances for outdoor use.

1.1.2 Types of noise

A classification of different types of noise is given in ISO 12001. The method specified in ISO 3744 is suitable for measurements of all types of noise emitted by household appliances. The methods specified in ISO 3743-1 and ISO 3743-2 are suitable for all types of noise, except for sources of impulsive noise consisting of short duration noise bursts. This will be taken into account in the preparation of parts 2.

1.1.3 Size of the source

The method specified in ISO 3744 is applicable to noise sources of any size. Limitations for the size of the source are given in 1.3 of ISO 3743-1 and ISO 3743-2. This will be taken into account in the preparation of parts 2.

1.2 Object

This standard is concerned with objective methods of engineering accuracy (grade 2 according to ISO 12001) for determining sound power levels L_W , expressed in decibels (dB) with reference to a sound power of one picowatt (1 pW), of airborne acoustical noise within the specified frequency range of interest (generally including the octave bands with centre frequencies from 125 Hz to 8 000 Hz), and for prescribed operating conditions of the appliance to be measured.

The following quantities are used: