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

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

Elektrische Geräte für den Hausgebrauch und ähnliche Zwecke - Prüfvorschrift für die Bestimmung der Luftschallemission -- Teil 1: Allgemeine Anforderungen

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

[SIST EN 60704-1:2001](#)

<https://standards.iteh.ai/catalog/standards/sist/dfcd5acf-15a9-4bcf-9d1f-2c9109d29ee0/sist-en-60704-1-2001>

Ta slovenski standard je istoveten z: EN 60704-1:1997

ICS:

17.140.20	Emisija hrupa naprav in opreme	Noise emitted by machines and equipment
97.030	Domestične električne naprave in oprema na splošno	Domestic electrical appliances in general

SIST EN 60704-1:2001

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60704-1:2001

<https://standards.iteh.ai/catalog/standards/sist/dfcd5acf-15a9-4bcf-9d1f-2c9109d29ee0/sist-en-60704-1-2001>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60704-1

March 1997

ICS 17.140.20; 97.030

Supersedes EN 60704-1:1994

Descriptors: Domestic electrical appliances, noise from appliances, measurement, requirements, definitions

English version

Household and similar electrical appliances
Test code for the determination of airborne acoustical noise
Part 1: General requirements
(IEC 60704-1:1997)

Appareils électrodomestiques et
analogues - Code d'essai pour la
détermination du bruit aérien
Partie 1: Règles générales
(CEI 60704-1:1997)

Elektrische Geräte für den
Hausgebrauch und ähnliche Zwecke
Prüfvorschrift für die Bestimmung
der Luftschallemission
Teil 1: Allgemeine Anforderungen
(IEC 60704-1:1997)

This European Standard was approved by CENELEC on 1996-12-09. 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN 60704-1:2001](https://standards.iteh.ai/catalog/standards/sist/dfcd5acf-15a9-4bcf-9d1f-2c9109d29ec0/sist-en-60704-1-2001)

<https://standards.iteh.ai/catalog/standards/sist/dfcd5acf-15a9-4bcf-9d1f-2c9109d29ec0/sist-en-60704-1-2001>

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 59/162/FDIS, future edition 2 of IEC 60704-1, prepared by IEC TC 59, Performance of household electrical appliances, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60704-1 on 1996-12-09.

This European Standard supersedes EN 60704-1:1994.

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) 1997-11-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) -

NOTE: "dow" can only be fixed when the present standards EN 60704-2-1, EN 60704-2-3, EN 60704-2-4, EN 60704-2-5 and EN 60704-2-6 have been revised on the basis of this EN 60704-1:1997 and ratified by the Technical Board. These European Standards are currently based on EN 60704-1:1994. Forthcoming new European Standards on noise measurement (e.g. for shavers, fans, kitchen machines and range hoods) are already based on this EN 60704-1:1997.

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes A and ZA are normative and annex B is informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60704-1:1997 was approved by CENELEC as a European Standard without any modification.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60704-1:2001

<https://standards.iteh.ai/catalog/standards/sist/dfcd5acf-15a9-4bcf-9d1f-2c9109d29ec0/sist-en-60704-1-2001>

Annex ZA (normative)**Normative references to international publications
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 651	1979	Sound level meters	EN 60651	1994
IEC 704-3	1992	Test code for the determination of airborne acoustical noise emitted by household and similar electrical appliances Part 3: Procedure for determining and verifying declared noise emission values	EN 60704-3	1994
IEC 804	1985	Integrating-averaging sound level meters	EN 60804 ¹⁾	1994
IEC 1260	1995	Electroacoustics - Octave-band and fractional-octave-band filters	EN 61260	1995
ISO 3741	1988	Acoustics - Determination of sound power levels of noise sources - Precision methods for broad-band sources in reverberation rooms	EN 23741	1991
ISO 3742	1988	Acoustics - Determination of sound power levels of noise sources - Precision methods for discrete-frequency and narrow-band sources in reverberation rooms	EN 23742	1991
ISO 3743-1	1994	Acoustics - Determination of sound power levels of noise sources - Engineering methods for small, movable sources in reverberant fields using sound pressure Part 1: Comparison method for hard-walled test rooms	-	-
ISO 3743-2	1994	Part 2: Methods for special reverberation test rooms	-	-

1) EN 60804 includes A1:1989 to IEC 804.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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	1977	Acoustics - Determination of sound power levels of noise sources - Precision methods for anechoic and semi-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 60704-1:2001](https://standards.iteh.ai/catalog/standards/sist/dfcd5acf-15a9-4bcf-9d1f-2c9109d29ee0/sist-en-60704-1-2001)

<https://standards.iteh.ai/catalog/standards/sist/dfcd5acf-15a9-4bcf-9d1f-2c9109d29ee0/sist-en-60704-1-2001>

**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

60704-1

Deuxième édition
Second edition
1997-02

**Appareils électrodomestiques et analogues –
Code d'essai pour la détermination du bruit aérien –**

**Partie 1:
Règles générales**

iTeh STANDARD PREVIEW

**Household and similar electrical appliances –
Test code for the determination of airborne
acoustical noise**

<https://standards.iteh.ai/catalog/standards/sist/dfcd5acf-15a9-4bcf-9d1f-2c9109d29ee0/sist-en-60704-1-2001>

**Part 1:
General requirements**

© IEC 1997 Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'éditeur.

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission
Telefax: +41 22 919 0300

e-mail: inmail@iec.ch

3, rue de Varembe Geneva, Switzerland
IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

U

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

	Page
FOREWORD	5
INTRODUCTION	7
Clause	
1 Scope and object.....	9
2 Normative references	11
3 Terms and definitions	13
4 Measurement methods and acoustical environments	15
5 Instrumentation	19
6 Operation and location of appliances under test	21
7 Measurements of sound pressure levels	27
8 Calculation of sound pressure and sound power levels.....	35
9 Information to be recorded	39
10 Information to be reported	45
<p>STANDARD PREVIEW (standards.iteh.ai)</p>	
Figures	
1 Measurement surface – parallelepiped – with key microphone positions, for floor free-standing appliances.....	49
2 Measurement surface – parallelepiped – with key microphone positions, for floor-standing appliances placed against a wall.....	49
3 Measurement surface – parallelepiped – with key microphone positions, for high floor-standing appliances placed against a wall	50
4 Measurement surface – hemisphere – with key microphone positions for hand-held, table-type and floor-treatment appliances.....	51
5 Measurement surface – quarter-sphere – with key microphone positions for small floor-standing appliances placed against a wall.....	52
6 Measurement surface – parallelepiped – with five or nine microphone positions for stand-type appliances.....	53
Annexes	
A Standard test table	55
B Guidelines for the design of simple test rooms with essentially free-field conditions ...	57

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 1: General requirements

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The 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 electrical appliances.

This second edition cancels and replaces the first edition published in 1982 and constitutes a technical revision. It includes the conditions for using hard-walled test rooms and introduces the concept of time-averaged sound pressure level.

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

FDIS	Report on voting
59/162/FDIS	59/173/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.

Annex A forms an integral part of this standard.

Annex B is for information only.

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 ¹⁾ and ISO 9614-2 ²⁾ is under consideration.

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.

¹⁾ ISO 9614-1: 1993, *Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 1: Measurement.*

²⁾ ISO/DIS 9614-2: 1996, *Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 2: Measurement by scanning.*

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 704 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, launderettes, 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 1.2.2 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:

- A-weighted sound power level, L_{WA} ; and
- octave band sound power levels.

In general, the described methods are specified for appliances without an operator present. A part 2 can specify that an operator will be present only for the (rare) cases where an appliance can only be operated, or must be fed, by an operator.

Methods for determining sound power levels with precision accuracy (grade 1 according to ISO 12001), specified for example in ISO 3741 and ISO 3745, are not included in this standard. They may, however, be applied if the appropriate test environment and instrumentation are available.

NOTES

- 1 The noise values obtained under the described conditions of this part will not necessarily correspond with the noise experienced under the operational conditions of practical use.
- 2 For quality control during production etc., simplified methods may be appropriate. For noise reduction purposes, other measurement methods employing, for example, narrow-band analysis or intensity technics usually will have to be applied. These methods are not covered by this part.

1.3 Measurement uncertainty

The estimated values of the standard deviations of reproducibility of sound power levels determined according to this part are given in 1.4 of ISO 3743-1 and of ISO 3743-2, and in 1.4 of ISO 3744. But for a particular family of appliances of similar size with similar operating conditions, the standard deviations of reproducibility may be smaller than these values. Hence, in part 2, standard deviations smaller than those listed in ISO standards may be stated if substantiation is available from the results of suitable interlaboratory tests.

<https://standards.iteh.ai/catalog/standards/sist/dfcd5acf-15a9-4bcf-9d1f-1e902220a101/iec-704-3-1992>

IEC 704-3 gives values of standard deviations of reproducibility for several categories of appliances.

In case of discrepancies between the measurements where the results normally remain inside the foreseen standard deviation, it will be necessary to perform measurements according to the upper grade of accuracy: grade 1, laboratory or precision, as described in ISO 3741 or ISO 3745.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 704. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of IEC 704 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 651: 1979, *Sound level meters*

IEC 704-3: 1992, *Test code for the determination of airborne acoustical noise emitted by household and similar electrical appliances – Part 3: Procedure for determining and verifying declared noise emission values*