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colour inside

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

INTERNATIONAL
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COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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.
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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.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60704-1:2010. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

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

This fourth edition cancels and replaces the third edition published in 2010. This edition constitutes a technical revision.

It includes the following significant changes with respect to the previous edition:

a) update of references (especially to ISO standards);
b) revision of requirements on climatic conditions;
c) revision of requirements on background noise level.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
59/753/FDIS	59/762/RVD

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 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 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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~~ are 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~~ are 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 3743-1:2010, ISO 3743-2:2018 and ISO 3744:2010.

The adoption of these methods permits the use of ~~semi~~hemi-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.~~

The use of intensity methods as described in ISO 9614-1:1993, ISO 9614-2:1996, and ISO 9614-3:2002 is applicable under special conditions, which are described in specific parts of the IEC 60704-2 series.

~~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~~ can 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 conditions similar to those found in households, for example in inns, coffee houses, tea rooms, hotels, barber or hairdresser shops, launderettes, etc., if not otherwise specified in the IEC 60704-2 series.

This document does not apply to

– appliances, equipment, or machines designed exclusively for industrial or professional purposes;

– appliances that are integrated parts of a building or its installations, such as equipment for air conditioning, heating and ventilating (except household fans, cooker hoods, free-standing heating appliances, dehumidifiers, air cleaners, and stand-alone water heaters), oil burners for central heating, pumps for water supply and for sewage systems;

– separate motors or generators and

– appliances exclusively for outdoor use.

For determining and verifying noise emission values declared in product specifications, see IEC 60704-3:2019.

~~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:~~

~~– *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.~~

~~NOTE 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.~~

~~NOTE 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 techniques 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.~~

~~IEC 60704-3 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 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 60038:2009, *IEC standard voltages*~~

IEC 60704-2 (all parts), *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise*

IEC 60704-3:~~2006~~2019, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 3: Procedure for determining and verifying declared noise emission values*

~~IEC 61260:1995, *Electroacoustics – Octave-band and fractional-octave-band filters*~~

IEC 61260-1:2014, *Electroacoustics – Octave-band and fractional-octave-band filters – Part 1: Specifications*

IEC 61672-1:~~2002~~2013, *Electroacoustics – Sound level meters – Part 1: Specifications*

~~ISO 3741:1999, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Precision methods for reverberation rooms*~~

ISO 3743-1:~~1994~~2010, *Acoustics – Determination of sound power levels of noise sources – Engineering methods for small, movable sources in reverberant fields – Part 1: Comparison method for hard-walled test rooms*

ISO 3743-2:~~1994~~2018, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering methods for small, movable sources in reverberant fields – Part 2: Methods for special reverberation test rooms*

ISO 3744:~~1994~~2010, *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 method for anechoic and hemi-anechoic rooms*~~

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

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

ISO 9614-3:2002, *Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 3: Precision method for measurement by scanning*

ISO 6926:~~1999~~2016, *Acoustics – Requirements for the performance and calibration of reference sound sources used for the determination of sound power levels*

ISO 12001:1996, *Acoustics – Noise emitted by machinery and equipment – Rules for the drafting and presentation of a noise test code*

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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



IEC 60704-1:2021-03(en-fr)

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Part 1: General requirements

1 Scope

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– separate motors or generators and
– appliances exclusively for outdoor use.

For determining and verifying noise emission values declared in product specifications, see IEC 60704-3:2019.

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IEC 60704-3:2019, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 3: Procedure for determining and verifying declared noise emission values*

IEC 61260-1:2014, *Electroacoustics – Octave-band and fractional-octave-band filters – Part 1: Specifications*

IEC 61672-1:2013, *Electroacoustics – Sound level meters – Part 1: Specifications*

ISO 3743-1:2010, *Acoustics – Determination of sound power levels of noise sources – Engineering methods for small, movable sources in reverberant fields – Part 1: Comparison method for hard-walled test rooms*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – CODE D'ESSAI POUR LA DÉTERMINATION DU BRUIT AÉRIEN –

Partie 1: Exigences générales

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La Norme internationale IEC 60704-1 a été établie par le comité d'études 59 de l'IEC: Aptitude à la fonction des appareils électrodomestiques et analogues.

Cette quatrième édition annule et remplace la troisième édition parue en 2010. Cette édition constitue une révision technique.

Elle inclut les modifications majeures suivantes par rapport à l'édition précédente:

a) mise à jour des références (notamment aux normes ISO);
b) révision des exigences relatives aux conditions climatiques;
c) révision des exigences relatives au niveau de bruit de fond.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
59/753/FDIS	59/762/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Le présent document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 60704, publiées sous le titre général *Appareils électrodomestiques et analogues – Code d'essai pour la détermination du bruit aérien*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu du présent document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

INTRODUCTION

Bien que les niveaux de bruit émis par les appareils électrodomestiques ne présentent pas, en général, un danger pour l'oreille de l'opérateur ou d'autres personnes exposées, la nécessité de disposer de méthodes normalisées pour la détermination du bruit émis a été reconnue depuis longtemps. Il convient donc de spécifier de telles méthodes, non seulement pour des types particuliers d'appareils, mais également pour la majorité des appareils couramment utilisés auxquels il convient d'appliquer ces principes.

En général, la détermination des niveaux de bruit est une partie seulement d'un ensemble de méthodes d'essai couvrant les nombreux aspects de propriétés et caractéristiques d'aptitude à la fonction de l'appareil. Il est donc important que les exigences pour les mesures de bruit (à savoir, environnement d'essai, appareils de mesure, quantité de travail nécessaire) soient maintenues à un niveau raisonnable.

Les résultats des mesures de bruit sont utilisés à des fins diverses, par exemple pour la déclaration du bruit ou pour comparer le bruit émis par un appareil spécifique au bruit émis par d'autres appareils de la même famille. Dans d'autres cas, les résultats servent de base pour des études d'ingénierie, par exemple pour le développement de nouveaux équipements ou pour décider des moyens à adopter pour une insonorisation. Dans tous les cas, il est important de spécifier des procédures ayant une exactitude connue de telle sorte que les résultats des mesures effectuées par différents laboratoires puissent être comparés.

Ces conditions ont, dans la mesure du possible, été prises en considération lors de l'établissement du présent code d'essai. Les méthodes de mesure acoustiques sont basées sur celles décrites dans les normes ISO 3743-1:2010, ISO 3743-2:2018 et ISO 3744:2010.

Ces méthodes autorisent l'utilisation de salles semi-anéchoïques, de salles d'essai réverbérantes spéciales et de salles d'essai à parois dures. Le résultat des mesures est le niveau de puissance acoustique de l'appareil. Dans les limites de l'incertitude de mesure qui caractérise ces méthodes, les résultats de la détermination dans les conditions de champ libre sur plan réfléchissant sont égaux à ceux obtenus en champ réverbéré.

L'utilisation des méthodes par intensimétrie spécifiées dans les normes ISO 9614-1:1993, ISO 9614-2:1996 et ISO 9614-3:2002 est applicable dans des conditions spéciales qui sont décrites dans les parties correspondantes de la série IEC 60704-2.

Le présent code d'essai ne concerne que le bruit aérien. Dans certains cas, le bruit solidien, transmis par exemple à la pièce voisine, peut avoir de l'importance.

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – CODE D'ESSAI POUR LA DÉTERMINATION DU BRUIT AÉRIEN –

Partie 1: Exigences générales

1 Domaine d'application

La présente partie de l'IEC 60704 s'applique aux appareils électriques pour usages domestiques et analogues, y compris leurs accessoires ou composants, alimentés à partir du réseau ou par piles ou accumulateurs.

L'expression "usages analogues" s'entend des usages dans des conditions similaires à celles des foyers domestiques, par exemple dans les restaurants, cafés, salons de thé, hôtels, salons de coiffure, laveries, etc. sauf spécification contraire dans la série IEC 60704-2.

Le présent document ne s'applique pas

– aux appareils, équipements ou machines conçus exclusivement pour des usages industriels ou professionnels;
– aux appareils qui font partie intégrante d'un bâtiment ou de ses installations, tels que les équipements de climatisation, de chauffage ou de ventilation (à l'exception des ventilateurs domestiques, des hottes de cuisine et des appareils de chauffage indépendants, des déshumidificateurs, des épurateurs d'air et des chauffe-eau indépendants), aux brûleurs à mazout pour le chauffage central, aux pompes pour l'alimentation en eau et pour les systèmes d'eaux usées;
– aux moteurs ou générateurs individuels; et
– aux appareils exclusivement destinés à une utilisation à l'extérieur.

Pour déterminer et vérifier les valeurs d'émission acoustique déclarées dans les spécifications de produit, voir l'IEC 60704-3:2019.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60704-2 (toutes les parties), *Appareils électrodomestiques et analogues – Code d'essai pour la détermination du bruit aérien*

IEC 60704-3:2019, *Appareils électrodomestiques et analogues – Code d'essai pour la détermination du bruit aérien – Partie 3: Méthode de détermination et de vérification des valeurs déclarées d'émission sonore*

IEC 61260-1:2014, *Electroacoustique – Filtres de bande d'octave et de bande d'une fraction d'octave – Partie 1: Spécifications*

IEC 61672-1:2013, *Electroacoustique – Sonomètres – Partie 1: Spécifications*

ISO 3743-1:2010, *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 d'expertise en champ réverbéré applicables aux petites sources transportables – Partie 1: Méthode par comparaison en salle d'essai à parois dures*

ISO 3743-2:2018, *Acoustique – Détermination des niveaux de puissance acoustique émis par les sources de bruit à partir de la pression acoustique – Méthodes d'expertise en champ réverbéré applicables aux petites sources transportables – Partie 2: Méthodes en salle d'essai réverbérante spéciale*

ISO 3744:2010, *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 d'expertise pour des conditions approchant celles du champ libre sur plan réfléchissant*

ISO 9614-1:1993, *Acoustique – Détermination par intensimétrie des niveaux de puissance acoustique émis par les sources de bruit – Partie 1: Mesurages par points*

ISO 9614-2:1996, *Acoustique – Détermination par intensimétrie des niveaux de puissance acoustique émis par les sources de bruit – Partie 2: Mesurage par balayage*

ISO 9614-3:2002, *Acoustique – Détermination par intensimétrie des niveaux de puissance acoustique émis par les sources de bruit – Partie 3: Méthode de précision pour mesurage par balayage*

ISO 6926:2016, *Acoustique – Prescriptions relatives aux performances et à l'étalonnage des sources sonores de référence pour la détermination des niveaux de puissance acoustique*

ISO 12001:1996, *Acoustique – Bruit émis par les machines et équipements – Règles pour la préparation et la présentation d'un code d'essai acoustique*