

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

Part 2-10: Particular requirements for ranges, ovens, steam ovens, grills and microwave ovens

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

Partie 2-10: Exigences particulières pour les cuisinières, les fours, les fours à vapeur, les grils et les fours à micro-ondes



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
TEST CODE FOR THE DETERMINATION
OF AIRBORNE ACOUSTICAL NOISE –****Part 2-10: Particular requirements for ranges,
ovens, steam ovens, grills and microwave ovens**

FOREWORD

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IEC 60704-2-10 has been prepared by subcommittee 59K: Performance of household and similar electrical cooking appliances, of IEC technical committee 59: Performance of household and similar electrical appliances. It is an International Standard.

This third edition cancels and replaces the second edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) alignment with the fourth edition of IEC 60704-1:2021;
- b) alignment with IEC 60350-1:2023 regarding the definitions and settings;
- c) introduction of the measurement of the steam function;
- d) revision of settings and test parameters.

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

Draft	Report on voting
59K/396/FDIS	59K/398/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

This document is intended to be used in conjunction with IEC 60704-1:2021, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 1: General requirements*.

The relevant text of IEC 60704-1:2021 as amended by this publication establishes the test code ranges, ovens, steam ovens, grills and microwave ovens.

This document supplements or modifies the corresponding clauses in IEC 60704-1:2021. When a particular subclause of IEC 60704-1:2021 is not mentioned in this document, that subclause is applicable as far as reasonable. Where this document states "addition", "modification" or "replacement", the relevant requirements, test specifications or explanatory matter in IEC 60704-1:2021 are to be adapted accordingly.

Subclauses, tables and figures that are numbered starting from 101 are additional to those in IEC 60704-1:2021. Additional annexes are lettered AA, BB, etc.

Unless notes are in a new subclause or involve notes in IEC 60704-1:2021, they are numbered starting from 101, including those in a replaced clause or subclause.

In this standard, the following print types are used:

- terms defined in Clause 3: bold type.

A list of all parts in the IEC 60704 series, published 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
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INTRODUCTION

The measuring conditions specified in this document provide for sufficient accuracy in determining the noise emitted and comparing the results of measurements taken by different laboratories, whilst simulating as far as possible the practical use of ranges, ovens, steam ovens, grills and microwave ovens.

It is recommended to consider the determination of noise levels as part of a comprehensive testing procedure covering many aspects of the properties and performance of household appliances.

NOTE As stated in the Introduction to IEC 60704-1, this test code is concerned with airborne noise only.

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

Part 2-10: Particular requirements for ranges, ovens, steam ovens, grills and microwave ovens

1 Scope

Addition:

These particular requirements apply to ranges, ovens, steam ovens, **grills** and microwave ovens for household and similar use.

This document does not apply to hobs.

This document does not apply to appliances or parts of appliances that use gas energy.

Requirements for the declaration of noise emission values are not within the scope of this document.

2 Normative references

Addition:

IEC 60350-1:2023, *Household electric cooking appliances – Part 1: Ranges, ovens, steam ovens and grills – Methods for measuring performance*

IEC 60705:–¹, *Household microwave ovens – Methods for measuring performance*

3 Terms and definitions

Addition:

3.101

grill

appliance or part of an appliance in which food is cooked by radiant heating

[SOURCE: IEC 60350-1:2023, 3.6]

3.102

steam function

heat transmission to the food mainly by condensation of steam at ambient pressure (approximately 100 kPa) and with a temperature ≤ 100 °C

[SOURCE: IEC 60350-1:2023, 3.21]

¹ Under preparation. Stage at the time of publication: IEC FDIS 60705:2024.

3.103**hot steam function**

heat transmission to the food by generated steam in combination with radiation or convection, or a combination of both, at ambient pressure (approximately 100 kPa) and with a temperature > 100 °C

[SOURCE: IEC 60350-1:2023, 3.9]

3.104**heating function**

heat transmission by natural or forced air circulation, or radiation for baking and roasting

EXAMPLE

- Forced air circulation function which heats food mainly by circulating the air with the aid of a fan;
- conventional **heating function** which heats food mainly by natural convection of the air;
- or a combination of both functions.

Note 1 to entry: Heat transmission by steam or by microwave power, also in combination with any **heating function**, is excluded.

[SOURCE: IEC 60350-1:2023, 3.7]

3.105**microwave function**

function using only electromagnetic energy in one or several of the ISM frequency bands between 300 MHz and 30 GHz for heating food and beverages in a cavity

[SOURCE: IEC 60705:–, 3.5]

3.106**combination microwave function**

heat transfer by electromagnetic energy simultaneously or consecutively with energy transfer by forced air circulation, conventional heating, by hot steam or by steam

[SOURCE: IEC 60705:–, 3.2, modified – the note has been removed.]

3.107**multiple cavity appliance**

appliance that has more than one separate cavity in which food is cooked and which can be controlled independently, but cannot be installed separately

[SOURCE: IEC 60350-1:2023, 3.10]

4 Measurement methods and acoustical environments**4.2 Direct method***Addition:*

If pure tone components are present in the noise emitted by the source, the estimated standard deviation of the measured sound pressure levels in the special reverberation room can increase. In such cases additional microphone positions or source positions are necessary as specified in ISO 3743-2.

4.3 Comparison method

Addition:

If pure tone components are present in the noise emitted by the source, the estimated standard deviation of the measured sound pressure levels in the hard-walled test room or in the special reverberation room can increase. In such cases additional microphone positions or source positions are necessary as specified in ISO 3743-1 or ISO 3743-2.

4.5 Measurement uncertainty

4.5.2 Standard deviations on repeatability and reproducibility and standard deviations related to declaration and verification

Replacement:

The estimated values of standard deviations of sound power levels, determined according to this document are given in Table 1.

Table 1 – Standard deviations of sound power levels

Standard deviation dB	
σ_r (repeatability)	σ_R (reproducibility)
estimated 0,4	estimated 1,0

For the purpose of determining and verifying declared noise emission values according to IEC 60704-3, the values in Table 2 apply:

Table 2 – Standard deviations for declaration and verification

Standard deviation dB		
σ_p (production)	σ_t (total)	σ_M (reference)
estimated 1,0 to 1,7	estimated 1,4 to 2,0	2,0

NOTE The standard deviation of repeatability, reproducibility and production and the total standard deviation have not been verified recently. Because of technical development of the appliances it is possible that these values are not correct anymore. Especially for steaming function the correct standard deviations can be different to the values given here.

5 Instrumentation

5.1 Instrumentation for measuring acoustical data

Addition:

The use of a windscreen shall be considered. If necessary, the observed sound pressure level shall be corrected for changes in the microphone sensitivity, in accordance with the instructions accompanying the instrumentation.