

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

Part 2-14: Particular requirements for refrigerators, frozen-food storage cabinets and food freezers

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

Partie 2-14: Exigences particulières pour les réfrigérateurs, conservateurs et congélateurs



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VERSION REDLINE



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

**Part 2-14: Particular requirements for refrigerators,
frozen-food storage cabinets and food freezers**

FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 60704-2-14 edition 2.1 contains the second edition (2013-01) [documents 59/590/FDIS and 59/595/RVD] and its amendment 1 (2019-03) [documents 59M/104/FDIS and 59M/105/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 60704-2-14 has been prepared by IEC technical committee 59: Performance of household and similar electrical appliances.

This second edition constitutes a technical revision.

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

- a) the description of an appropriate test enclosure has been removed from this part of IEC 60704 and has been incorporated into Part 1 of IEC 60704-1;
- b) the values of standard deviations of sound power levels determined according to this part of IEC 60704 have been added.

The French version of this standard has not been voted upon.

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

This Part 2-14 is intended to be used in conjunction with the third edition (2010) of IEC 60704-1, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 1: General requirements*.

NOTE When "Part 1" is mentioned in this standard, it refers to IEC 60704-1.

The relevant text of Part 1 as amended by this publication establishes the test code for refrigerators, frozen-food storage cabinets and food freezers.

This Part 2-14 supplements or modifies the corresponding clauses in IEC 60704-1. When a particular subclause of Part 1 is not mentioned in this Part 2-14, that subclause is applicable as far as reasonable. Where this standard states "addition", "modification" or "replacement", the relevant requirements, test specifications or explanatory matter in Part 1 are to be adapted accordingly.

Subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1. Additional annexes are lettered AA, BB, etc.

Unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause.

A list of all the 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 the base publication and its amendment 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

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INTRODUCTION

The measuring conditions specified in this part of 60704 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 household refrigerators, frozen-food storage cabinets and food freezers.

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 refrigerators, frozen-food storage cabinets and food freezers.

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 2-14: Particular requirements for refrigerators, frozen-food storage cabinets and food freezers

1 Scope and object

This clause of Part 1 is applicable except as follows:

1.1 Scope

1.1.1 General

Addition:

These particular requirements apply to refrigerators, frozen-food storage cabinets and food freezers (fitted with their accessories) for household and similar use, supplied from the mains or from batteries.

1.1.2 Types of noise

Replacement:

The methods specified in ISO 3743-1, ISO 3743-2 and ISO 3744 can be used for measuring noise emitted by refrigerators, frozen-food storage cabinets and food freezers.

1.1.3 Size of the source

Replacement:

The method specified in ISO 3744 is applicable to noise sources of any size. When applying ISO 3743-1 and ISO 3743-2, care should be taken to ensure that the maximum size of the refrigerator, frozen-food storage cabinet or food freezer under test fulfils the requirements specified in ~~4.3~~ 1.2 of ISO 3743-1:2010 and 1.3 of ISO 3743-2:1994.

1.2 Object

Addition:

These described methods are specified for appliances without an operator present.

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

NOTE 101 For determining and verifying noise emission values declared in product specifications, see IEC 60704-3.

1.3 Measurement uncertainty

Replacement:

The estimated values of standard deviations of sound power levels determined according to this standard are indicated in Table 101:

Table 101 – Standard deviations of sound power levels

Standard deviation (dB)	
σ_r (repeatability)	σ_R (reproducibility)
0,4	0,7

Addition:

1.101 Standard deviation for declaration and verification

For the purpose of determining and verifying declared noise emission values according to IEC 60704-3, the values indicated in Table 102 apply:

Table 102 – Standard deviations for declaration and verification

Standard deviation (dB)		
σ_P (production)	σ_t (total)	σ_M (reference)
0,7 to 1,5	1,0 to 1,7	2,0

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

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

ISO 3744:2010, *Acoustics – Determination of sound power levels and sound energy levels of a noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting pane*

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

Addition:

3.101 running period

for a refrigerator, frozen-food storage cabinet ~~or~~ and food freezer, period which begins when the compressor turns on and ends when the compressor turns off

Note 1 to entry: If, however, the compressor runs for longer than 4 h, an aperiodic behaviour with no specific running period can be identified.

3.102 accessory

detachable part intended to be loaded by things to be cooled

3.103

temperature control cycle

time within the repetitive temperature pattern between two successive temperature warmest points or two successive temperature coldest points

3.104

steady state

considered as being achieved when the mean values of the compartment internal temperatures as stated in 6.4.2 are within the mentioned tolerances over a temperature control cycle

4 Measurement methods and acoustical environments

This clause of Part 1 is applicable except as follows:

4.2 Direct method

Addition:

NOTE 101 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 could be necessary as specified in ISO 3743-2.

4.3 Comparison method

Addition:

NOTE 101 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 could be necessary as specified in ISO 3743-1 or ISO 3743-2.

5 Instrumentation

[IEC 60704-2-14:2013](https://standards.iteh.ai/catalog/standards/iec/69ea2427-edc8-4962-986c-6e17082bb280/iec-60704-2-14-2013)

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This clause of Part 1 is applicable except as follows:

5.2.1

Replacement:

The temperature is determined with instruments having an accuracy of $\pm 0,5$ °C.

6 Operation and location of appliances under test

This clause of Part 1 is applicable except as follows:

6.1 Equipping and pre-conditioning of appliances

6.1.1

Addition:

Loose accessories inside the appliance (e.g. racks or ice-trays) which could unusually vibrate when empty shall be adjusted or fixed, for example by tape. Doors or lids shall be closed.

If available, adjustable feet shall be adjusted according to the manufacturer's instructions to give minimum noise emission.

6.1.3

Replacement:

Prior to noise measurements, the appliance, equipped as for intended use, shall have been in operation for the running-in for at least 16 h at an ambient temperature as specified in 6.3.

During the running-in the thermostat adjustment has to be ascertained which establishes the test temperature as specified in 6.4.2.

6.1.4

Replacement:

Immediately before each series of noise measurements, the appliance shall be operated until a steady state has been reached but at least for three complete running periods.

6.2 Supply of electrical energy and of water or gas

6.2.4 Not applicable.

6.3 Climatic conditions

Modification:

ambient temperature $t = 23\text{ °C} \pm 3\text{ °C}$

6.4 Loading and operating of appliances during test

6.4.1

Replacement:

<https://standards.iteh.ai/IEC/60704-2-14:2013/962-986c-6e17082bb280/iec-60704-2-14-2013>
The appliance shall operate without a load (i.e. empty).

Adjustable slots and openings between different compartments which may be operated by the user shall be closed.

6.4.2

Replacement:

For determining noise emission of an appliance, it shall be operated at the following compartment internal temperatures.

- Refrigerators
 - fresh-food storage compartment: $5\text{ °C} \pm 2\text{ K}$
 - frozen-food storage compartment: no limitation
 - chill compartment (if applicable): no limitation
- Freezers
 - food freezer compartment: $-22\text{ °C} \pm 2\text{ K}$
- Refrigerator-freezers
 - fresh-food storage compartment: $5\text{ °C} \pm 2\text{ K}$
 - food freezer compartment without separate thermostat: no limitation
 - food freezer compartment with separate thermostat: $-22\text{ °C} \pm 2\text{ K}$