# IEC 60704-2-14

Edition 2.2 2024-02
CONSOLIDATED VERSION

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

colour inside

## 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



IEC 60704-2-14:2013-01+AMD1:2019-03+AMD2:2024-02 CSV(en-fr)

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# REDLINE VERSION

# VERSION REDLINE

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# CONTENTS

FOREWORD ..... 3
INTRODUCTION ..... 6
1 Scope and object ..... 7
1.1 Scope ..... 7
1.2 Object ..... 7
1.3 Measurement uncertainty ..... 8
1.101 Standard deviation for declaration and verification ..... 8
2 Normative references ..... 8
3 Terms and definitions ..... 8
4 Measurement methods and acoustical environments ..... 9
4.2 Direct method ..... 9
4.3 Comparison method ..... 9
5 Instrumentation ..... 9
6 Operation and location of appliances under test ..... 10
6.1 Equipping and pre-conditioning of appliances ..... 10
6.2 Supply of electrical energy and of water or gas ..... 10
6.3 Climatic conditions ..... 10
6.4 Loading and operating of appliances during test ..... 10
6.5 Location and mounting of appliances ..... 12
7 Measurement of sound pressure levels ..... 12
7.1 Microphone array, measurement surface and RSS location for essentially free-field conditions over reflecting plane(s) ..... 12
7.4 Measurements ..... 13
8 Calculation of sound pressure and sound power levels ..... 13
9 Information to be recorded ..... 13
10 Information to be reported ..... 13
Annexes ..... 15
Annex A (normative) Standard test table ..... 15
Bibliography ..... 16

Figure 101 – Measurement surface – parallelepiped – with key microphone positions for high floor-standing appliances placed against a wall ..... 14

Table 101 – Standard deviations of sound power levels ..... 8
Table 102 – Standard deviations for declaration and verification ..... 8

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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**IEC 60704-2-14 edition 2.2 contains the second edition (2013-01) [documents 59/590/FDIS and 59/595/RVD], its amendment 1 (2019-03) [documents 59M/104/FDIS and 59M/105/RVD] and its amendment 2 (2024-02) [documents 59M/167/FDIS and 59M/168/RVD].**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. 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 this document and its amendments 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,
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- revised.

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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.

# 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~~ refrigerating appliances (fitted with their accessories) for household and similar use, supplied from the mains or from batteries.

NOTE This document does not apply to air conditioners.

#### 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~~ refrigerating appliances.

#### 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 3743-2:1994, care ~~should~~ shall be taken to ensure that the maximum size of the ~~refrigerator, frozen-food storage cabinet or food freezer~~ refrigerating appliance under test fulfils the requirements specified in ~~1.3~~ 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) | |
|---|---|
| $\sigma_r$ (repeatability) | $\sigma_R$ (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) | | |
|---|---|---|
| $\sigma_P$ (production) | $\sigma_t$ (total) | $\sigma_M$ (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.~~

period which begins when the compressor or another cooling system turns on and ends when the compressor or the cooling system turns off

**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

**3.105**
**refrigerating appliance**
insulated cabinet with one or more compartments that are controlled at specific temperatures and are of suitable size and equipped for household use, cooled by natural convection or a forced convection system whereby the cooling is obtained by one or more energy-consuming means

Note 1 to entry: From the point of view of installation, there are various types of household refrigerating appliances (free-standing, portable, wall-mounted, built-in, etc.).

**3.106**
**aperiodic behaviour**
behaviour without specific running period when the compressor or the cooling system (in appliances without compressor) runs for longer than 4 h

## 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

This clause of Part 1 is applicable except as follows: