IEC 60704-2-5

Edition 2.1 2014-10
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Household and similar electrical appliances – Test code for the determination of airborne acoustical noise –
Part 2-5: Particular requirements for electric thermal storage room heaters

Appareils électrodomestiques et analogues – Code d'essai pour la détermination du bruit aérien –
Partie 2-5: Règles particulières pour les appareils électriques de chauffage des locaux à accumulation

IEC 60704-2-5:2005-07+AMD1:2014-10 CSV(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-5: Particular requirements for electric thermal storage room heaters

FOREWORD

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IEC 60704-2-5 edition 2.1 contains the second edition (2005-07) [documents 59C/124/FDIS and 59C/127/RVD] and its amendment 1 (2014-10) [documents 59C/178/CDV and 59C/186/RVC].

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

International standard IEC 60704-2-5 has been prepared by subcommittee 59C: Heating appliances, of IEC technical committee 59: Performance of household electrical appliances.

The second edition of this standard cancels and replaces the first edition published in 1989 and constitutes a technical revision. This revision has become necessary due to the publication of the second edition of IEC ~~60705-1~~ 60704-1. There are no major technical changes, apart from those introduced in IEC ~~60705-1~~ 60704-1.

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

This Part 2-5 is intended to be used in conjunction with IEC 60704-1, ~~2nd edition, 1997~~ 3rd edition, 2010: *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 1: General requirements*.

The relevant text of Part 1 as amended by this publication establishes the test code for electric thermal storage room heaters.

This Part 2-5 supplements or modifies the corresponding clauses in IEC 60704-1. When a particular subclause of Part 1 is not mentioned in this Part 2-5, that subclause applies as far as reasonable. Where this Part 2-5 states "addition", "modification" or "replacement", the relevant requirements, test specifications or explanatory matter in Part 1 shall be adapted accordingly.

Subclauses or figures which are additional to those in Part 1 are numbered starting from 101.

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.

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

- reconfirmed,
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INTRODUCTION

The measuring conditions specified in this Part 2-5 provide for sufficient accuracy in determining the levels of noise emitted and comparing the results of measurements taken by different laboratories, whilst simulating as far as possible the practical use of electric thermal storage room heaters.

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 electric thermal storage room heaters.

NOTE 1 As stated in the introduction to Part 1, this test code is concerned with airborne noise only.

NOTE 2 The noise measurements are carried out without heating for three main reasons:

– the origin of noise is the fan;

– the heating takes a very long time;

– the overheating of the room and the measurement equipment.

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

Part 2-5: Particular requirements for electric thermal storage room heaters

1 Scope and object

This clause of Part 1 is applicable except as follows:

1.1 Scope

1.1.1 General

Replacement:

These particular requirements apply to the electric thermal storage room heaters having forced convection output, designed for placing on the floor, for wall-mounting or for building-in.

These particular requirements do not apply to:

– controlled output thermal storage heaters with natural convection;
– free output thermal storage heaters;
– permanently installed central storage heating systems or their parts.

1.1.2 Types of noise

Replacement:

ISO 3743-1, ISO 3743-2 and ISO 3744 can all be used for measuring noise emitted by electric thermal storage room heaters.

1.1.3 Size of the source

Replacement:

The method specified in ISO 3744 is applicable to noise sources of any size (limited only by available test environment). When applying ISO 3743-1 and ISO 3743-2, care should be taken that the maximum size of the appliance under test fulfils the requirements specified in 1.3 of ISO 3743-1 and ISO 3743-2.

1.2 Object

Addition:

The frequency range of interest, for sound power determination on electric thermal storage room heaters, includes at least the octave bands with centre frequencies from 63 Hz to 8 000 Hz.

NOTE 101 In many cases, the 63 Hz octave band level does not participate significantly to the A-weighted level.

NOTE 102 When measuring this 63 Hz octave band, a special attention should be paid to the room effect.

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

NOTE 103 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:

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

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 following values apply:

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

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

Addition:

3.101
storage heater
heater which stores heat obtained from electric energy by charging an accumulating core before a heat demand in a room occurs, the heat being discharged at any time.

[IEC 60531:1999, definition 3.1[1)]].

[1)] IEC 60531:1999, *Household electric thermal storage room heaters – Methods for measuring performance*

3.102
minimum discharge condition
condition under which the appliance is operated, the means for controlling the heat output, such as flaps and fans, being set at the lowest position.

[IEC 60531:1999, definition 3.2].

3.103 .
maximum discharge condition
condition under which the appliance is operated, the means for controlling the heat output, such as flaps and fans, being set at the highest position, any boost position being ignored.

NOTE A boost position is a setting of a control for occasional use, which results in a higher temporary fan speed.

[IEC 60531:1999 definition 3.3].

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, proper precautions should be taken as specified in ISO 3743-2.

4.3 Comparison method

Addition:

NOTE 101 If pure tone components are present in the noise emitted, proper precautions should be taken as specified in ISO 3743-1 and ISO 3743-2.

5 Instrumentation

This clause of Part 1 is applicable.

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 *Replacement:*

The appliance shall be assembled and mounted as specified by the manufacturer. Air inlet and outlet openings, louvers, flaps, air filters, fans, blowers, etc., and the path(s) for the air within the appliance shall be clean.

6.1.3 *Replacement:*

Prior to noise measurements, any fan or blower shall have been in operation for a total period of at least 1 h for running-in, at the highest speed setting for normal permanent use.

During the running-in procedure, air filters, if any, may be removed. If filters remain in the appliance during the running-in period, they shall be clean or renewed after this period.

6.1.4 *Replacement:*

Immediately before each series of noise measurements, the appliance equipped in accordance with 6.1.1, is operated for stabilizing at the highest speed setting for normal permanent use for at least 2 min.

6.2 Supply of electric energy and of water or gas

6.2.1 *Modification:*

The voltage tolerance shall be ± 0,5 %.

6.2.2 Not applicable

6.2.4 Not applicable

6.4 Loading and operating of appliances during tests

6.4.2 *Replacement:*

The appliance shall be equipped according to 6.1.1.

The noise emission values shall be determined for the highest speed setting of the fan for normal permanent use (maximum discharge condition), without heating.

Other possible speed settings (minimum discharge condition, boost position, etc.) can be measured in addition.

NOTE 101 The relevant noise levels should be linked to the room heating capability provided by the manufacturer, according to IEC 60531.

6.4.3 and 6.4.4 Not applicable

6.5 Location and mounting of appliances

6.5.2 Not applicable

6.5.3 *Replacement:*

For measurements on floor-standing appliances intended for placing against a wall, including those for building in, a vertical reflecting plane having an acoustic absorption coefficient of less than 0,06 shall be used.

When measurements are made in a reverberation test room, a part of the wall of the room will serve for this purpose. The minimum area of this part of the wall shall be determined by the projection of the appliance extended by at least 0,5 m upwards and to both sides. The minimum distance between any surface of the appliance or its cabinet and the nearest corner of the room shall be 1 m.

When measurements are made in a free-field environment over a reflecting plane, the size of the vertical reflecting plane (supported by the horizontal reflecting plane) shall be at least equal to the size of the projection of the measurement surface.

For both types of test environment the following requirements shall be complied with:

– the appliance shall be placed in the test environment without any resilient means of support other than those incorporated in the appliance;
– care shall be taken to avoid any direct contact between the appliance (including protruding parts, worktops, spacers, etc.) and the vertical reflecting wall;
– the distance between the back of the appliance and the vertical reflecting plane shall be the minimum distance given by the manufacturer or (10 ± 1) cm, whichever is the largest.

6.5.4 *Addition:*

The distance between the lowest edge of the appliance and the floor shall be the minimum distance given by the manufacturer or (25 ± 1) cm, whichever is the largest.

7 Measurement of sound pressure levels

This clause of Part 1 is applicable except as follows.

7.1 Microphone array, measurement surface and RSS location for essentially free-field conditions over reflecting plane(s)

7.1.3 Not applicable

7.1.5 and 7.1.6 Not applicable

7.4 Measurements

7.4.1 *Addition*:

The A-weighted time-averaged sound pressure level shall be measured during at least 30 s.

7.4.4 Not applicable

8 Calculation of sound pressure and sound power levels

This clause of Part 1 is applicable.

9 Information to be recorded

This clause of Part 1 is applicable except as follows:

9.7 Electric supply, water supply, etc.

9.7.2 to 9.7.4 Not applicable

9.12 Measurement data

9.12.5 Not applicable