IEC 60704-2-2

Edition 3.0 2023-12
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Household and similar electrical appliances – Test code for the determination of airborne acoustical noise –
Part 2-2: Particular requirements for fan heaters

IEC 60704-2-2:2023-12 RLV(en)

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CONTENTS

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

Part 2-2: Particular requirements for fan heaters

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60704-2-2:2009. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60704-2-2 has been prepared by subcommittee 59C: Electrical heating appliances for household and similar purposes, 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 2009. This edition constitutes a technical revision.

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

– alignment with the latest edition of IEC 60704-1:2021,
– addition of several ISO standards,
– revision of built-in-conditions,
– addition of requirements on climatic conditions and on background noise.

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

Draft	Report on voting
59C/284/CDV	59C/286/RVC

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 part 2-2 is intended to be used in conjunction with the fourth edition of 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 for fan heaters.

This part 2-2 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 part 2-2, that subclause applies as far as reasonable. Where this standard states "addition", "modification" or "replacement", the relevant requirement, test specifications or explanatory matter in IEC 60704-1:2021 shall be adapted accordingly.

Subclauses or figures which are additional to those in IEC 60704-1:2021 are numbered starting from 101.

Additional annexes are lettered AA, BB, etc.

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.

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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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INTRODUCTION

The measuring conditions specified in this part 2-2 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 fan 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 fan heaters.

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 2-2: Particular requirements for fan heaters

1 Scope ~~and object~~

~~This clause of part 1 is applicable except as follows:~~

~~1.1 Scope~~

~~1.1.1 General~~

Replacement:

This part of IEC 60704 applies to electric fan heaters, designed for placing on the floor, table or counter, etc., or for ~~wall~~ mounting.

This document does not apply to

– electric storage room heaters;
– room humidifiers;
– room dehumidifiers;
– air cleaners;
– heaters designed exclusively for industrial purposes.

~~1.1.2 Types of noise~~

~~*Replacement:*~~

~~ISO 3743-1, ISO 3743-2 and ISO 3744 can be used for measuring noise emitted by fan heaters.~~

~~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 that the maximum size of the appliance under test fulfils the requirements specified in Subclause 1.3 of ISO 3743-1 and ISO 3743-2.~~

~~1.2 Object~~

~~*Addition:*~~

~~The frequency range of interest for sound power determination on fan heaters includes at least the octave bands with centre frequencies from 63 Hz to 8000 Hz.~~

~~NOTE 1 In many cases, the 63 Hz octave band level does not participate significantly to the A-weighted level.~~

~~NOTE 2 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 3~~ For determining and verifying noise emission values~~,~~ declared in product specifications, refer to IEC 60704-3:2019.

~~1.3 Measurement uncertainty~~

~~*Replacement:*~~

~~The estimated values of standard deviations of sound power levels, determined according to this standard, are as follows:~~

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

~~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)~~
~~0,3 – 1,1~~	~~1,0 – 1,6~~	~~1,5~~

2 Normative references

This clause of IEC 60704-1:2021 is applicable.

3 Terms and definitions

This clause of IEC 60704-1:2021 is applicable.

4 Measurement methods and acoustical environments

This clause IEC 60704-1:2021 is applicable except as follows:

4.2 Direct method

Addition:

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

4.3 Comparison method

Addition:

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

4.4 Acoustical environments

4.4.1 General requirements and criterion for adequacy of the test environment

Replacement:

ISO 3743-1, ISO 3743-2 and ISO 3744 can be used for measuring noise emitted by fan heaters.

The method specified in ISO 3744 is applicable to noise sources of any size. When applying ISO 3743-1 and ISO 3743-2, care shall be taken that the maximum size of the appliance under test fulfils the requirements specified in ISO 3743-1:2010, 1.3 and ISO 3743-2.

4.5 Measurement uncertainties

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)
0,4	1,0

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

Table 2 – Standard deviations for declaration and verification

Standard deviation dB		
σ_P (production)	σ_t (total)	σ_M (reference)
0,3 to 1,1	1,0 to 1,6	1,5

5 Instrumentation

This clause of IEC 60704-1:2021 is applicable except as follows:

5.1 Instrumentation for measuring acoustical data

Addition:

Windscreens should be used and the relevant corrections for changes in the microphone sensitivity shall be added to the observed sound pressure levels.

6 Operation and location of appliances under test

This clause of IEC 60704-1:2021 is applicable except as follows:

6.1 Equipping and pre-conditioning of appliances

6.1.1 *Addition:*

Air filters, if any, shall be clean.

6.1.3 *Replacement:*

Prior to noise measurements, the appliance, equipped in accordance with 6.1.1, shall have been in operation for a total period of at least 2 h for running-in at the highest speed setting with the maximum heating switched on for normal permanent use.

Oscillating function if available shall be switched on.

During the running-in procedure, air filters, if any, ~~may~~ shall be removed, if possible. If filters remain in the appliances during this running-in period, they shall be cleaned 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 shall be operated for stabilizing at the highest speed setting and maximum heating switched on for normal permanent use for 5 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.

6.2.3 *Replacement:*

The appliance shall be operated with the heating elements switched on.

Special attention is required to be given to the possible effect of the temperature rise on the acoustical behaviour of the test room.

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 shall be determined with the appliance at the highest speed setting and maximum heating for normal permanent use. Oscillating ~~mechanism~~ function, if any, shall be switched on.