

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

**Household and similar electrical appliances – Test code for the determination
of airborne acoustical noise –
Part 2-15: Particular requirements for household food waste disposers**



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ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-15: Particular requirements for household food waste disposers

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A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

IEC-PAS 60704-2-15 has been prepared by IEC technical committee 59: Performance of household and similar electrical appliances.

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
59/502/NP	59/508/RVN

The list of all the parts of 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.

This Part 2-15 is intended to be used in conjunction with the second edition (1997) of IEC 60704-1: *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 1: General requirements*.

This Part 2-15 supplements or modifies the corresponding clauses in IEC 60704-1. When a particular subclause of Part 1 is not mentioned in this Part 2-15, that subclause is applicable as far as reasonable. Where this PAS states “addition”, “modification” or “replacement”, the relevant requirements, test specifications or explanatory matter in Part 1 should be adapted accordingly.

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

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single 3-year period, following which it shall be revised to become another type of normative document, or shall be withdrawn.

INTRODUCTION

The measuring conditions specified in this proposed test code provide for sufficient accuracy in determining the noise emitted, and comparing the results taken by different laboratories, whilst simulating as far as possible the practical use of food waste disposers.

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

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 2-15: Particular requirements for household food waste disposers

1 Scope

This clause of Part 1 is applicable except as follows:

1.1 Scope

1.1.1 General

Replacement

These particular requirements apply to single unit electric food waste disposers for household and similar use, with or without automatic program control, for cold water supply, for permanent connection to water supply and sewage systems, intended for connection to the kitchen sink drain and contained within a kitchen cabinet enclosure.

Limitations for the use of this test code are given in 1.1.1 of IEC 60704-1.

1.1.2 Types of noise

Replacement

ISO 3743-1, ISO 3743-2, and ISO 3744 may be used for measuring noise emitted by food waste disposers.

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 cabinet enclosing the food waste disposer under test fulfills the requirements specified in 1.3 of ISO 3743-1 and ISO 3743-2.

1.2 Object

Addition

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

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

1.3 Measurement uncertainty

Addition

Standard deviations for the kitchen machine category of appliances from IEC 60704-3 are applicable.

2 Normative references

This clause of Part 1 is applicable.

Addition:

ANSI/ASME A112.19.3-2000, *Stainless Steel Plumbing Fixtures (Designed for Residential Use)*

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

3.4 operational cycle

Addition:

This begins with the start of the cycle by the operator and ends either when the operator turns off the disposer for manual operation or the disposer is turned off by a controller for automatic operation

Addition:

3.101 batch feed operation

method of operation in which the operator loads the food waste into the container body prior to starting the water flow and then the operational cycle of the disposer

3.102 standard “hard” test load for noise measurements

the standard “hard” test load for noise measurements during grinding shall be fifteen (15) 12,7 mm (0,5 inch) diameter nylon 6/6 balls; the grind media shall be conditioned by soaking in water for 7 days prior to use

3.103 standard “soft” test load for noise measurements

the standard “soft” load for noise measurements during grinding shall be 200 grams of baby carrots

3.104 grinding operation

operation cycle for the disposer in which a standard test load is ground and flushed through the discharge to the sewer lines with a specified water flow rate

4 Measurement methods and acoustical environment

The 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:

6.1.3 Replacement:

Prior to commencing measurements, the inside of the grind chamber shall be clean and free of any debris from prior operation. The food waste disposer shall be run through 10 complete operational cycles, of a 30 s duration, with a 'hard' test load (3.102).

6.1.4 Not applicable.

6.2 Supply of electric energy and of water or gas

6.2.1 Replacement:

The supply voltage is measured at the plug of a non-detachable cable or cord, at the appliance inlet if a detachable cord is provided or no cable is provided, but in no case at the entrance of extensions cables or cords.

6.2.2 Not applicable

6.2.3 Not applicable

6.2.4 Replacement:

The temperature of the supply water shall be between 4 °C and 27 °C.

The flow rate of the water supply shall be $6 \pm 0,3$ L/min. The water faucet shall be positioned in such a way that the water flows down the side of the sink into the drain, creating negligible water splash noise.

6.4 Loading and operating of appliances during tests

6.4.2 Replacement:

The test load shall be at room temperature when the test program starts.

The appliance under test shall be at room temperature when the test program starts.

The appliance shall be operated according to 3.101 using each of the test loads as described in 3.102 and 3.103. An operator shall be present to place the test load in the grind chamber and to start and stop the operational cycle of the disposer. The operator's position shall be chosen to minimize the influence upon the acoustic measurement and shall be consistent for all tests.

A 10 s measurement shall be taken that encompasses the start of the operational cycle.

Upon completion of the measurements, the remaining material in the grind chamber is to be removed and the disposer flushed with water to ensure no material remains. An auditory check shall be made of the unit running without any water or load to ensure that no material remains in the grind chamber. Ensure that no test load remains on the top lip of the grind chamber.

Three trials shall be run for each type of test load and the results of each trial reported. At least 5 min with cold water running through the disposer shall be allowed between trials to allow the food waste disposer to return to ambient conditions.

6.5 Location and mounting of appliances

6.5.1 Not applicable.

6.5.2 Not applicable.

6.5.3 *Replacement:*

For measurements on floor-standing appliances intended for placing against a wall (including cabinets, counters, or test enclosures for building in or under counter types) a vertical reflecting plane shall be available.

When the measurements are made in a hard-walled test room or in a special reverberation test room, a part of a wall of the room will serve for this purpose. The minimum area of this part of the wall should 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 (cabinet, counter, or test enclosure) and the nearest corner of the room shall be 1 m.

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

For both types of test environments, the requirements given below shall be followed.

- the acoustic absorption coefficient of the vertical reflecting plane shall be less than 0,06;
- the appliance shall be placed in the test environment without any resilient means other than those incorporated in the appliance;
- care should be taken to avoid any direct contact between the appliance (including protruding parts, worktops, spacers, etc.) and the vertical reflecting plane;
- the distance between the vertical reflecting plane and the appliance shall be established by placing the appliance in direct contact with the vertical reflecting plane and then moving it away a distance of 10 cm \pm 1 cm.

6.5.4 Not applicable.

6.5.5 *Replacement:*

The food waste disposer manufacturer's instructions regarding installation and use of the disposer shall be followed.

The test cabinet shall be constructed as shown in Figure 101.

A standard laminate over particle board countertop shall be rigidly mounted to the top of the cabinet. A 838 mm \times 559 mm (33 in \times 22 in), 24 gauge, double bowl stainless steel sink

conforming to ASME A112.19.3-2000 shall be installed in the countertop as specified by the sink manufacturer's instructions. The bowl depth shall be 165,1 mm (6.5 in) and each bowl 356 mm (14 in) by 400 mm (15,75 in). The drain holes shall be centered within each bowl. The faucet shall be deck mounted using the mounting holes provided in the sink and installed as specified by the faucet manufacturer's instructions. On the underside of each sink bowl shall be two (2) 76,2 mm (3 in) × 76,2 mm (3 in) damping pads aligned with the drain holes and centered between the drain holes and the front and back of the sink.

The food waste disposer shall be mounted in one bowl of the sink. Each sink bowl shall have an individual P-trap, connecting to a Y- fitting. The sewer or drain line shall be connected to the Y-fitting.

Cutouts may be provided in the back or lower side of the cabinet for electrical, water, and sewage connections. Care should be taken that the cutouts are the minimum size required for the services and shut by sealing means to prevent noise leakage. Care should be taken to ensure the supply lines are properly isolated to prevent transmission of structure-borne noise

The test enclosure with appliance is to be placed as specified in 6.5.3.

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)

7.1.1 Not applicable.

7.1.3 Not applicable.

7.1.4 Not applicable.

7.1.5 Not applicable.

7.1.6 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:

9.6 Equipment and pre-conditioning of appliance under test

9.6.2 Not applicable.

9.6.3 Not applicable.

9.7 Electric supply, water supply, etc.

9.7.2 Not applicable.

9.7.3 *Replacement:*

Water flow rate with tolerance.

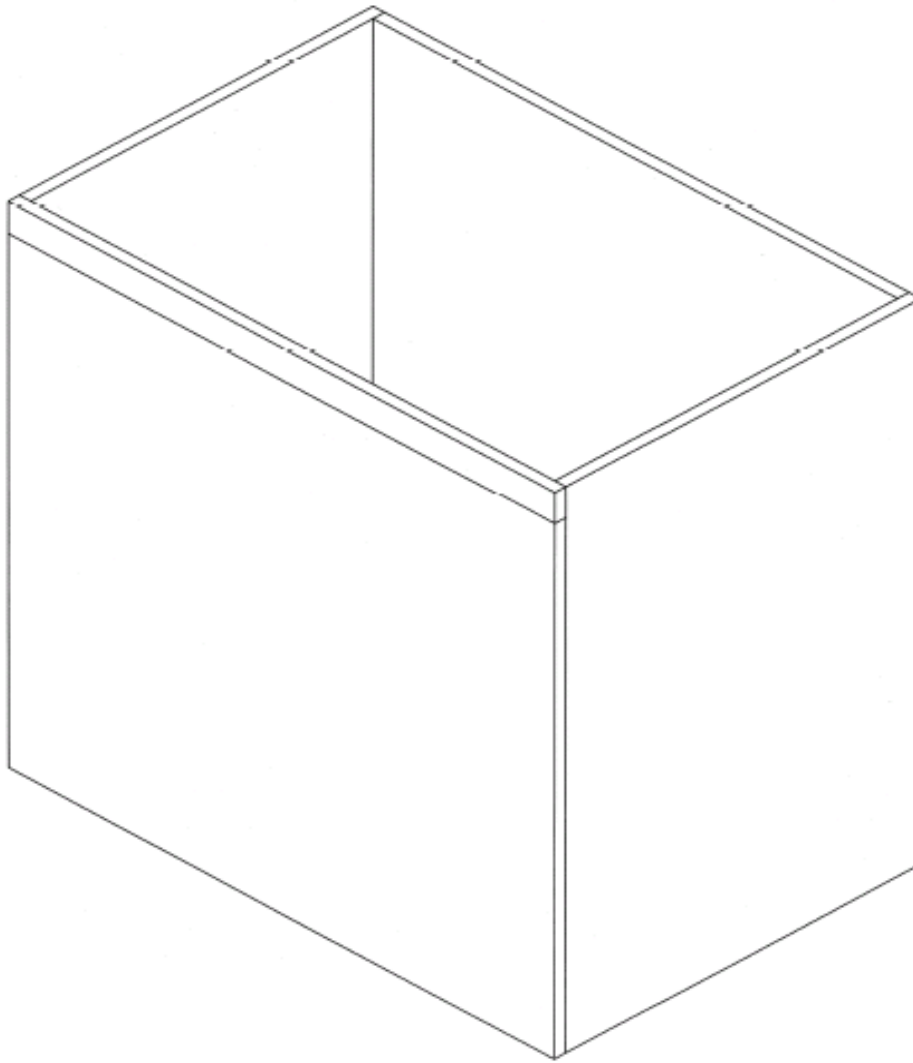
9.7.4 Not applicable.

10 Information to be reported

This clause of Part 1 is applicable except as follows:

10.3.3 Not applicable.

10.3.5 Not applicable.



Measures of the enclosure: see 6.5.5

NOTE 1 Material: 19 mm thick untreated particle-board (chipboard) or untreated plywood, with a density between 600 kg/m^3 and 750 kg/m^3 .

NOTE 2 Front panel should be removable to access disposer plumbing.

Figure 101 – Test enclosure

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