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Date: 01 March 2023

Origin: International

Latest date for receipt of comments: 19 April 2023

Project No. 2021/01793

Responsible committee: CPL/59 Performance of household electrical appliances

Interested committees:

Title: BS EN IEC 63399 Household and similar use electrical rice cookers - Methods for measuring the performance

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- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

PROJECT NUMBER:

IEC 63399 ED1

DATE OF CIRCULATION:

2023-02-24

CLOSING DATE FOR COMMENTS:

2023-05-19

SUPERSEDES DOCUMENTS:

59L/201/NP, 59L/205A/RVN

IEC SC 59L : SMALL HOUSEHOLD APPLIANCES

SECRETARIAT:

Italy

SECRETARY:

Mr Davide Pietrosevoli

OF INTEREST TO THE FOLLOWING COMMITTEES:

PROPOSED HORIZONTAL STANDARD:



Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

☐ EMC☒ ENVIRONMENT☐ QUALITY ASSURANCE☐ SAFETY

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of

- any relevant patent rights of which they are aware and to provide supporting documentation,
- any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "in some countries" clauses. See AC/22/2007.

TITLE:

Household and similar electrical rice cookers – Methods for measuring the performance

NOTE FROM TC/SC OFFICERS:

This document has been prepared by PT 63399.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL RICE COOKERS–
METHODS FOR MEASURING THE PERFORMANCE****FOREWORD**

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International Standard has been prepared by subcommittee 59L: Small household appliances, of IEC technical committee Performance of household and similar electrical appliances:

The text of this standard is based on the following documents:

FDIS	Report on voting
59L/XXX/FDIS	59L/XXX/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The National Committees are requested to note that for this publication the stability date is 2025.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

HOUSEHOLD AND SIMILAR ELECTRICAL RICE COOKERS– METHODS FOR MEASURING THE PERFORMANCE

1 Scope

This International Standard applies to household and similar electrical rice cookers.

This standard defines the main performance characteristics that are of interest to the user and specifies methods of measuring these characteristics.

This standard does not specify the requirements for performance.

This standard does not apply to the pressure type rice cooker or the micro-pressure rice cooker.

NOTE 1 This standard does not deal with safety requirements (IEC 60335-2-15).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62301 *Household electrical appliances – Measurement of standby power*

3 Terms and definitions

For the purpose of this document, the following definitions apply.

3.1

rice cooker

appliance for cooking rice that is placed in a detachable inner pot, the inner pot being placed within the appliance when cooking

3.2

induction rice cooker

rice cooker that heats the inner pot by means of eddy currents

NOTE: The eddy currents are induced in the inner pot, or inner pot and lid by the electromagnetic field of a coil.

3.3

capacity of rice cooker

total volume of the inner pot of rice cooker

3.4

rated capacity of rice cooker

capacity of rice cooker declared by the manufacturer

3.5

pressure type rice cooker

rice cooker that cooks at a pressure more than 40 kPa

3.6

micro-pressure rice cooker

rice cooker that cooks at a pressure larger than 10 kPa but not more than 40 kPa

3.7**stand-by mode**

any product modes where the energy using product is connected to a mains power source and offers one or more of the following user oriented or protective functions which usually persist

□□- to facilitate the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, timer;

□□- continuous function: information or status displays including clocks;

□□- continuous function: sensor-based functions

NOTE: Optional definition: a power on state in which the **rice cooker** is ready for interaction with the user, before confirming to heat up or cook.

3.8**reservation state**

a power on state in which the **rice cooker** counts the timing and starts to work or finishes the function once a period of time set by the user in advance elapses

3.9**keep-warm state**

a power on state in which the **rice cooker** keeps low electric heating power to maintain the warm temperature of the cooked rice

3.10**expansion rate**

the ratio of the volume increase of the cooked rice to the volume of the raw rice

NOTE: The raw rice becomes bigger sized after cooked.

4 List of measurements and tests

- Volume of inner pot of **rice cooker** (6.1.1)
- Endurance of the inner pot coatings– abrasion resistance (6.1.2)
- Endurance of the inner pot coatings– corrosion resistance (6.1.3)
- Cooking uniformity (6.2.1)
- Moisture deviation (6.2.2)
- Burnt levels of the cooked rice (6.2.3)
- Temperature retention during keep-warm state (6.3)
- Energy efficiency (6.4)
- Power consumption in stand-by mode (6.5.1)
- Power consumption in reservation state (6.5.2)
- Power consumption during keep-warm state (6.5.3)
- Performance in low-voltage supply (6.6)
- Endurance of operation (6.7)

Evaluation of physical characteristics of the cooked rice is provided in an informative Annex A.

5 General conditions for measurements

Unless otherwise specified, the tests are carried out under the conditions of 5.1 to 5.8.

5.1 General

If the instructions for use of the **rice cooker** recommend the setting, then that setting shall be used.

If the instructions for use of the **rice cooker** do not recommend the setting, the default function setting shall be used.

Unless otherwise specified, the water used in the test is pure water with the ambient temperature.

5.2 Test environment

The tests are carried out in a substantially draught-free room. The ambient temperature is maintained at $(23\text{ °C} \pm 2\text{ °C})$.

The relative humidity is maintained at 45 %~75 %.

The air pressure for the test shall be 98 kPa~102 kPa.

5.3 Limits of voltage variation

During the tests, the variation in the voltage shall not exceed $\pm 1\%$ of the test voltage.

5.4 Test voltage

Unless otherwise specified, the tests are carried out at a specific voltage within a voltage range (e.g., 100V to 240V) or at the rated voltage or voltages (e.g., 120V, or 120V and 240V).

5.5 Test frequency

The appliances are tested at the rated frequency or within a rated frequency range (e.g. rated as 50 Hz and 60 Hz, or 50 Hz to 60 Hz).

5.6 Test electrical supply system

Total harmonic distortion of the test electrical supply system shall be less than 5%.

5.7 Conditioning prior to the test

The **rice cooker** including the inner pot, the outer pot and the water for test, shall remain 6 h under the ambient temperature.

The control setting of the **rice cooker** shall be set to the function of rice-cooking.

5.8 Requirements for measurement instruments

The accuracy of voltmeter and wattmeter shall not be larger than $\pm 0.5\%$.

The resolution of the instrument used to measure temperature shall be 0.1 °C .

With full scale, the relative error of weighing apparatus shall not exceed $\pm 0.1\%$ and their resolution shall be less than 1g.

The resolution of timer shall be 0.01 s.

The wire diameter of thermocouple shall not larger than 0.3mm.

6 Measurements

6.1 Cooking inner pot

6.1.1 Volume of inner pot

- a) The mass of the inner pot is weighted as m_1 ;
- b) The inner pot shall be positioned horizontally and filled with the water until the level of water reaches the top edge of the inner pot. See Figure 1. The total weight of the inner pot and water is measured as m . If the top surface of water is affected by the surface tension, the water is leveled with a surfactant.

NOTE: Any commercially available rinsing agent may be used as the surfactant.

- c) The actual volume of the inner pot shall be calculated by the formula (1) as below. The deviation of volume shall be calculated by formula (2).

$$V_c = \frac{m - m_1}{\rho} \quad (1)$$

Where

V_c - the actual volume of the inner pot, in L;

m - the total mass of the inner pot and water filed in it, in kg;

m_1 - the mass of the inner pot, in kg;

ρ - the density of water, taken as 1 kg/L.

$$\delta = \frac{V_c}{V_e} \times 100 \quad (2)$$

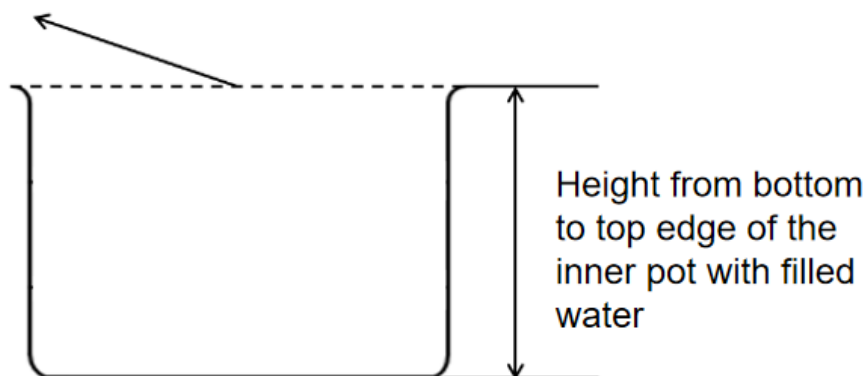
Where

δ - the volume deviation of the inner pot, in %, round off two decimal place;

V_c - the actual volume of the inner pot, in L;

V_e - the rated volume of the inner pot, in L.

water top edge



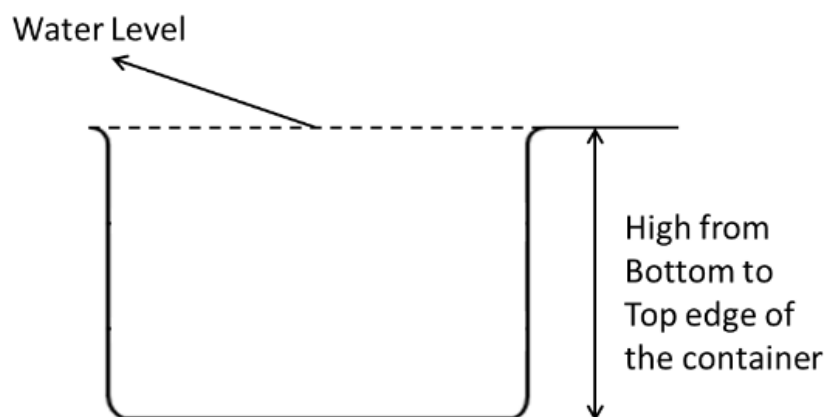


Figure 1 - Drawing of top edge of inner pot with filled water

6.1.2 Endurance of the coating of the inner pot -Abrasion resistance

The test set up is shown in Figure 2.

A clean inner pot of the **rice cooker** is fixed on the test equipment as shown in Figure 2. The size of the jig to which the scouring pad is attached shall be $60\text{ mm} \pm 3\text{ mm}$ in length and $20\text{ mm} \pm 3\text{ mm}$ in width. A scouring pad (Type: 3M7447B) with dimensions of the length $70\text{ mm} \pm 5\text{ mm}$ and the width of $30\text{ mm} \pm 5\text{ mm}$ is placed on the middle of bottom surface of the inner pot. A downward force of 15N is applied on the scouring pad. The pad is moved in a reciprocating manner with the reciprocation speed of 30 cycles/min and the reciprocation distance of 100mm (50mm in each direction). One complete reciprocating movement is called one cycle (i.e. from the middle to the left end, from the left end back to the middle, from the middle to the right end and from the right end back to the middle).

NOTE: For the inner pot with small capacity (less than 3 liter), the stroke distance could be accordingly adjusted.

The coating surface of the inner pot is inspected at the interval of 250 cycles by means of a 10-multiple magnifying glass. At the same interval, the scouring pad is replaced with a new one. The test is terminated when a trace of the exposed substrate with a width of more than 1mm is detected on the coating surface of the inner pot.

Record the total number of cycles before termination of the test.