



SLOVENSKI STANDARD
oSIST prEN IEC 63399:2023
01-december-2023

**Gospodinjski in podobni električni kuhalniki za riž - Metode za merjenje
zmogljivosti**

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

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97.040.50 **Majhni gospodinjski aparati** **Small kitchen appliances**

oSIST prEN IEC 63399:2023

en



PROJECT NUMBER:

IEC 63399 ED1

DATE OF CIRCULATION:

2023-10-20

CLOSING DATE FOR VOTING:

2024-01-12

SUPERSEDES DOCUMENTS:

59L/232/CD, 59L/243/CC

IEC SC 59L : SMALL HOUSEHOLD APPLIANCES	
SECRETARIAT: Italy	SECRETARY: Mr Davide Pietrosemoli
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TITLE:

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

PROPOSED STABILITY DATE: 2027

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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

113
114 Full information on the voting for the approval of this standard can be found in the report on
115 voting indicated in the above table.

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

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

- 120 • reconfirmed,
- 121 • withdrawn,
- 122 • replaced by a revised edition, or
- 123 • amended.

124

125 The National Committees are requested to note that for this publication the stability date is
126 2027.

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

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

135
136

137 **1 Scope**

138 This International Standard applies to household and similar electrical **rice cookers**.
139 This standard defines the main performance characteristics that are of interest to the user and
140 specifies methods for measuring these characteristics.
141 This standard does not specify the requirements for performance.
142 This standard does not apply to the pressure type **rice cooker** or the micro-pressure **rice**
143 **cooker**.
144 NOTE 1 The pressure type **rice cooker** refers to a **rice cooker** that cooks at a pressure more than 40 kPa.
145 NOTE 2 The micro-pressure **rice cooker** refers to a **rice cooker** that cooks at a pressure larger than 10 kPa but
146 not more than 40 kPa.
147 NOTE 3 This standard does not deal with safety requirements (IEC 60335-2-15).
148 NOTE 4 Some of the tests which are specified in this standard are not considered to be reproducible since the
149 results may vary between laboratories. They are therefore intended for comparative testing purposes only.

150 **2 Normative references**

151 The following referenced documents are indispensable for the application of this document. For
152 dated references, only the edition cited applies. For undated references, the latest edition of
153 the referenced document (including any amendments) applies.
154 IEC 62301 *Household electrical appliances – Measurement of standby power*

155 **3 Terms and definitions**

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

157 **3.1**

158 **rice cooker**

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

161 **3.2**

162 **Rated volume of rice cooker**

163 total volume of the inner pot of a **rice cooker** declared by the manufacturer

164 **3.3**

165 **stand-by mode**

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

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

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

172 □□- continuous function: sensor-based functions

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

175 **3.4**

176 **reservation state**

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

179 **3.5**

180 **keep-warm state**

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

183 **3.6**

184 **expansion rate**

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

186 NOTE: The raw rice becomes bigger sized after cooked.

187 **4 List of measurements and tests**

188 - Volume of inner pot of **rice cooker** (6.1.1)

189 - Endurance of the inner pot coatings– abrasion resistance (6.1.2)

190 - Endurance of the inner pot coatings– corrosion resistance (6.1.3)

191 - Cooking uniformity (6.2.1)

192 - Moisture deviation (6.2.2)

193 - Burnt levels of the cooked rice (6.2.3)

194 - Temperature retention during keep-warm state (6.3)

195 - Energy efficiency (6.4)

196 - Power consumption in stand-by mode(6.5.1)

197 - Power consumption in reservation state(6.5.2)

198 - Power consumption during keep-warm state(6.5.3)

199 - Performance in low-voltage supply (6.6)

200 - Endurance of operation (6.7)

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

202 **5 General conditions for measurements**

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

204 **5.1 General**

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

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

209 Unless otherwise specified, the water used in the test is the drinking water with the ambient
210 temperature.

211 NOTE The drinking water refers to the water which is used for cooking in the area of the lab.

212 **5.2 Test environment**

213 The tests are carried out in a draught-free location at an ambient temperature of $20\text{ °C} \pm 5\text{ °C}$.
214 Ambient temperature is maintained at $23\text{ °C} \pm 2\text{ °C}$ for temperature-sensitive cooking and
215 warming performance.

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

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

218 **5.3 Limits of voltage variation**

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

220 **5.4 Test voltage**

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

223 **5.5 Test frequency**

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

226 **5.6 Test electrical supply system**

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

228 **5.7 Conditioning prior to the test**

229 The **rice cooker** including the inner pot, the outer pot and the water for the test, shall remain
230 6 h under the ambient temperature.

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

232 **5.8 Requirements for measurement instruments**

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

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

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

237 The accuracy of time shall be $\pm 5\text{ s}$.

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

239 **6 Measurements**

240 **6.1 Cooking inner pot**

241 **6.1.1 Volume of inner pot of rice cooker**

242 a) The mass of the inner pot is weighed and recorded as m_1 ;

243 b) The inner pot is positioned horizontally, and filled with the water until the level of water
244 reaches the top edge of the inner pot. See Figure 1. The total weight of the inner pot and
245 water is measured and recorded as m . If the top surface of water is affected by the surface
246 tension, the water is leveled with a surfactant;

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

248 c) The actual volume of the inner pot is calculated by the formula (1) as below. The
249 deviation from the **rated volume of rice cooker** is calculated by the formula (2).

$$250 \quad V_c = \frac{m - m_1}{\rho} \quad (1)$$

251 Where

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

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

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

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

256

$$257 \quad \delta = \frac{V_c}{V_e} \times 100\% \quad (2)$$

258 Where

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

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

261 V_e - the **rated volume of rice cooker**, in L.

262

water top edge



263

264

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

266 6.1.2 Endurance of the inner pot coatings -Abrasion resistance

267 The test set up is shown in Figure 2.

268 A clean inner pot of a **rice cooker** is fixed on the test equipment as shown in Figure 2. The
269 size of the jig to which the scouring pad is attached is 60 mm ± 3 mm in length and 20 mm ± 3
270 mm in width. The scouring pad (Type: 3M7447B) with dimensions of 70 mm ± 5 mm length
271 and 30mm ± 5mm width is placed on the middle of bottom surface of the inner pot. A