



# **Preparatory study for Kettles implementing the Ecodesign Working Plan 2016-2019**

## **Task 7: Policies and scenarios (draft)**

### **Annex on the proposed regulation**

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Directorate C - Renewables, Research and Innovation, Energy Efficiency  
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*European Commission  
B-1049 Brussels*

# **Preparatory study for Kettles implementing the Ecodesign Working Plan 2016-2019**

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2 ABOUT THIS DOCUMENT  
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5 **11.01.2021 - Draft:** Task 7 draft (Annex) for stakeholder consultation  
6 (THIS DOCUMENT)  
7  
8

9 **Please be aware that this draft consultation document is only published for**  
10 **receiving stakeholder comments to the Ecodesign Process. It may still undergo**  
11 **substantial revisions prior to being released as a final report of this study.**  
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27 **Study website:** [https://ec.europa.eu/energy/studies\\_main/preparatory-studies/ecodesign-and-energy-labelling-preparatory-study-electric-kettles\\_en](https://ec.europa.eu/energy/studies_main/preparatory-studies/ecodesign-and-energy-labelling-preparatory-study-electric-kettles_en)  
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32 **The main articles and annexes of the proposed regulation are presented**  
33 **in this document.**

34 *Article 1*

35 **Subject matter and scope**

36 This Regulation establishes ecodesign requirements for the placing on the market or the putting into  
37 service of electric mains-operated kettles with a rated volume up to 10 litres.

38 This Regulation shall not apply to:

- 39 1. kettles which are not stand-alone;  
40 2. Pressurized appliances.

41 *Article 2*

42 **Definitions**

43 For the purposes of this Regulation the following definitions shall apply:

- 44 (1) 'electric mains' means the electricity supply from the grid of 230 ( $\pm 10$  %) volts of  
45 alternating current at 50 Hz;
- 46 (2) 'kettle' means a portable appliance for boiling water with means for pouring, either a lip or  
47 spout. Potentially it also includes the possibility to heat water below boiling temperature  
48 and/or a warm-keeping function after heating.
- 49 (3) 'equivalent model' means a model which has the same technical characteristics relevant for  
50 the technical information to be provided, but which is placed on the market or put into  
51 service by the same manufacturer, importer or authorised representative as another model  
52 with a different model identifier;
- 53 (4) 'model identifier' means the code, usually alphanumeric, which distinguishes a specific  
54 product model from other models with the same trade mark or the same manufacturer's,  
55 importer's or authorised representative's name;
- 56 (5) 'product database' means a collection of data concerning products, which is arranged in a  
57 systematic manner and consists of a consumer-oriented public part, where information  
58 concerning individual product parameters is accessible by electronic means, an online portal  
59 for accessibility and a compliance part, with clearly specified accessibility and security  
60 requirements, as laid down in Regulation (EU) 2017/1369;

61 For the purposes of the annexes, additional definitions are set out in Annex A.

62 *Article 3*

63 **Ecodesign requirements**

64 The ecodesign requirements set out in Annex B shall apply.

65 *Article 4*

66 **Conformity assessment**

67 The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the  
68 internal design control system set out in Annex IV to that Directive or the management  
69 system set out in Annex V to that Directive.

- 70 1. For the purposes of the conformity assessment pursuant to Article 8 of Directive  
71 2009/125/EC, the technical documentation shall contain a copy of the product information  
72 provided in accordance with point 4 of Annex II, and the results of the calculations  
73 undertaken in accordance with Annex C.
- 74 2. Where the information included in the technical documentation for a particular model has  
75 been obtained:
- 76 (a) from a model that has the same technical characteristics relevant for the technical  
77 information to be provided but is produced by a different manufacturer; or
- 78 (b) by calculation on the basis of design or extrapolation from another model of the same  
79 or a different manufacturer, or both;

80 the technical documentation shall include the details of such calculation, the assessment  
81 undertaken by the manufacturer to verify the accuracy of the calculation and, where  
82 appropriate, the declaration of identity between the models of different manufacturers.  
83 3. The technical documentation shall include a list of all equivalent models, including the model  
84 identifiers.

85 *Article 5*

86 **Verification procedure for market surveillance purposes**

87 Member States' authorities shall apply the verification procedure set out in **Annex XX** when  
88 performing the market surveillance checks referred to in Article 3, point 2 of Directive 2009/125/EC.

89 *Article 6*

90 **Circumvention and software updates**

91 The manufacturer, importer or authorised representative shall not place on the market products  
92 designed to be able to detect they are being tested (for example by recognising the test conditions  
93 or test cycle) and to react specifically by automatically altering their performance during the test  
94 with the aim of reaching a more favourable level for any of the parameters in the technical  
95 documentation or included in any documentation provided.

96 The energy consumption of the product and any of the other declared parameters shall not  
97 deteriorate after a software or firmware update when measured with the same test standard  
98 originally used for the declaration of conformity, except with explicit consent of the end-user prior to  
99 the update. No performance change shall occur as a result of rejecting the update.

100 A software update shall never have the effect of changing the product's performance in a way that  
101 makes it non-compliant with the ecodesign requirements applicable for the declaration of conformity.

102 *Article 7*

103 **Indicative benchmarks**

104 The indicative benchmarks for the best-performing products and technologies available on the market  
105 at the time of adopting this Regulation are set out in **Annex XX**.

106 *Article 8*

107 **Review**

108 The Commission shall review this Regulation in the light of technological progress and shall present  
109 the results of this review, including, if appropriate, a draft revision proposal, to the Consultation  
110 Forum by **[date - OP please add 6 years after entry into force]**.

111 The review shall in particular focus on the following:

- 112 - the improvement potential with regard to energy and environmental performance of kettles.
- 113 - the effectiveness of existing requirements on resource efficiency;
- 114 - the appropriateness of the testing procedure;
- 115 - the level of the verification tolerances;
- 116 - the calculation of the standard energy consumption;
- 117 - the appropriateness of setting additional resource efficiency requirements for products in  
118 accordance with the principles of the circular economy, including whether more spare parts  
119 should be included.

120 *Article 9*

121 **Entry into force and application**

122 This Regulation shall enter into force on the twentieth day following that of its publication in the  
123 *Official Journal of the European Union*.

124 Article 3 shall apply from **[date - OP please insert date one year after entry into force]**.

125 This Regulation shall be binding in its entirety and directly applicable in all Member States.

126

## **Annex A**

127

### **Definitions applicable to potential ecodesign requirements**

128 The following definitions shall apply:

- 129 (1) 'Energy Efficiency Index' (EEI) means the ratio of the heat - theoretically needed to bring  
130 the rated capacity of water from 15°C to 95°C degrees - and the electricity consumed to  
131 boil the same amount of water until shut-off, the water has to be heated up to at least  
132 95°C;
- 133 (2) 'container' means the reservoir where the water is heated;
- 134 (3) 'temperature setting' means a feature by which the target water temperature can be pre-  
135 set;
- 136 (4) 'keep-warm' means a function, which keeps the water temperature in the range of a pre-  
137 set temperature.
- 138 (5) 'keep-warm time' mean the duration during which the keep-warm function is active;
- 139 (6) 'immersed heating element' means a heating element that is integrated in the container of  
140 a kettle, is partly surrounded and in direct contact with the liquid;
- 141 (7) 'concealed heating element' means a concealed heating element separated from the liquid  
142 by a heat exchanging element;
- 143 (8) 'Rcyc' means the recyclability rate;
- 144 (9) 'Rpost' means the post-consumer materials content;
- 145 (10) 'Post-consumer material' means material recovered from waste generated by households  
146 or by commercial, industrial and institutional facilities in their role as end-users of finished  
147 product
- 148 (11) 'lift-off / switch-off' means a function, which switches off a kettle when the container is  
149 lifted from the base. The kettles remains "off" when it is placed back on the base;
- 150 (12) 'base' means the component, which is directly linked with the power cord
- 151 (13) 'cordless kettle' is a kettle, where the container can be removed from the base;
- 152 (14) 'spare part' means a separate part that can replace a part with the same or similar function  
153 in a product;
- 154 (15) 'professional repairer' means an operator or undertaking which provides services of repair  
155 and professional maintenance of kettles;
- 156 (16) 'declared values' means the values provided by the manufacturer, importer or authorised  
157 representative for the stated, calculated or measured technical parameters in accordance  
158 with Article 4, for the verification of compliance by the Member State authorities;
- 159 (17) 'guarantee' means any undertaking by the retailer or a manufacturer to the consumer to:  
160 reimburse the price paid; or replace, repair or handle kettles in any way if they do not meet  
161 the specifications set out in the guarantee statement or in the relevant advertising.



162

## **Annex B**

163

### **Proposed Ecodesign requirements**

164 **1. ENERGY EFFICIENCY REQUIREMENTS**

165 The energy efficiency index (EEI) of kettles, calculated pursuant to the methodology set out in Annex  
166 C, shall not be below 83 %.

167 **2. FUNCTIONAL REQUIREMENTS**

168 Kettles shall meet the following requirements:

169 (1) Kettles with keep-warm function:

170 (a) Keep-warm function should be off by default when a user switches on the kettle;

171 (b) Keep-warm time shall be limited to a maximum of 30 minutes;

172 (c) Container shall be insulated, meaning that the temperature drop ( $T_{drop}$ ) during cool-  
173 down test shall be lower than 20°C.

174 (2) "lift-off / switch-off" function is mandatory for cordless kettles;

175 (3) indication of the minimum volume of water to be filled:

176 (4) mandatory dual water level indication on the appliance in litre and in cup (cup volume of  
177 0.125 litre)

178 **3. MATERIAL EFFICIENCY REQUIREMENTS**

179 Kettles shall meet the following requirements:

180 **3.1. Design for repair and reuse**

181 (1) availability of spare parts:

182 (a) manufacturers, importers or authorised representatives of kettles shall make  
183 available to professional repairers and end-users at least the following spare parts:  
184 motherboard, switches, heating elements, temperature sensors, base, lids and  
185 limescale filters for a minimum period of six years, after placing the last unit of the  
186 model on the market;

187 (b) manufacturers shall ensure that these spare parts can be replaced with the use of  
188 commonly available tools and without permanent damage to the appliance;

189 (c) the list of spare parts concerned by point (a) and the procedure for ordering them  
190 and the repair instructions shall be included in the user manual and made publicly  
191 available on the manufacturer's, the importer's or authorised representative's free  
192 access website, at the moment of the placing on the market of the first unit of a  
193 model and until the end of the period of availability of these spare parts.

194 (d) The price and shipping costs of the spare parts concerned by point (a), and their  
195 period of applicability shall be provided in the product information sheet defined in  
196 Annex D.

197 (2) access to repair and maintenance information:

198 after the placing on the market of the first unit of a model or of an equivalent model, and  
199 for a minimum period of six years, after placing the last unit of the model on the market,  
200 the manufacturer, importer or authorised representative shall provide access to the  
201 appliance repair and maintenance information to professional repairers in the following  
202 conditions:

203 (a) the manufacturer's, importer's or authorised representative's website shall indicate  
204 the process for professional repairers to register for access to information; to accept  
205 such a request, manufacturers, importers or authorised representative may require  
206 the professional repairer to demonstrate that:

- 207 (1) the professional repairer has the technical competence to repair kettles and  
208 complies with the applicable regulations for repairers of electrical equipment in  
209 the Member States where it operates. Reference to an official registration  
210 system as professional repairer, where such system exists in the Member  
211 States concerned, shall be accepted as proof of compliance with this point;
- 212 (2) the professional repairer is covered by insurance covering liabilities resulting  
213 from its activity, regardless of whether this is required by the Member State;
- 214 (b) the manufacturers, importers or authorised representatives shall accept or refuse the  
215 registration if the repairer does not fulfil the criteria listed under points (a)(1) and  
216 (a)(2) within 5 working days from the date of request by the professional repairer;
- 217 (c) manufacturers, importers or authorised representatives shall provide free access to  
218 the repair and maintenance information or for receiving regular updates;
- 219 (d) once registered, a professional repairer shall have access, within one working day  
220 after requesting it, to the requested repair and maintenance information. The  
221 available repair and maintenance information shall include:
- 222 – the unequivocal appliance identification;
  - 223 – a disassembly map or exploded view;
  - 224 – list of necessary repair and test equipment;
  - 225 – component and diagnosis information (such as minimum and maximum  
226 theoretical values for measurements);
  - 227 – wiring and connection diagrams;
  - 228 – diagnostic fault and error codes (including manufacturer-specific codes, where  
229 applicable); and
  - 230 – data records of reported failure incidents stored on the kettle (where  
231 applicable).
- 232 (3) maximum delivery time of spare parts:  
233 Without prejudice to point (1), the manufacturer, importer or authorised representatives  
234 shall ensure the delivery of the spare parts within 15 working days after having received  
235 the order.

### 236 3.2. Recyclability requirements

237 The recyclability rate (in weight)  $R_{cyc}$  of a kettle shall be higher than 75%.

238 In addition:

- 239 (1) Manufacturers, importers or their authorised representatives shall ensure that joining,  
240 fastening or sealing techniques do not prevent the removal, using commonly available tools,  
241 of the components indicated in point 1 of Annex VII of Directive 2012/19/EU on WEEE or in  
242 Article 11 of Directive 2006/66/EC of the European Parliament and of the Council (1) on  
243 batteries and accumulators and waste batteries and accumulators, when present.
- 244 (2) Manufacturers, importers or their authorised representatives shall, without prejudice to  
245 point 1 of Article 15 of Directive 2012/19/EU, make available, on a free-access website, the  
246 dismantling information needed to access any of the products components referred to in  
247 point 1 of Annex VII of Directive 2012/19/EU.
- 248 (3) This dismantling information shall include the sequence of dismantling steps, tools or  
249 technologies needed to access the targeted components.
- 250 (4) The end of life information listed under points (1), (2) and (3) shall be available until at  
251 least 15 years after the placing on the market of the last unit of a product model.

252

### 253 3.3. Requirements on plastic components

- 254 (1) Plastic components heavier than 25 g:
- 255 (a) shall be marked by specifying the type of polymer with the appropriate standard  
256 symbols or abbreviated terms set between the punctuation marks '>' and '<' as  
257 specified in available standards. The marking shall be legible.

- 258 Plastic components are exempt from marking requirements in the following  
259 circumstances:
- 260 – the marking is not possible because of the shape or size; or
  - 261 – the marking would impact on the performance or functionality of the plastic  
262 component.
- 263 For the following plastic components no marking is required:
- 264 – packaging, tape, labels and stretch wraps;
  - 265 – wiring, cables and connectors, rubber;
  - 266 – PCB assemblies, PMMA boards, optical components, electrostatic discharge  
267 components, electromagnetic interference components, speakers;
  - 268 – transparent parts where the marking would obstruct the function of the part in  
269 question.
- 270 (b) shall additionally be marked if they contain flame retardants with the abbreviated  
271 term of the polymer followed by hyphen, then the symbol 'FR' followed by the code  
272 number of the flame retardant in parentheses. The marking on the enclosure and  
273 stand components shall be clearly visible and readable.
- 274 (2) Plastic parts intended to be touched in normal use (e.g. handles and controls) shall contain  
275 less than 10 mg/kg of polycyclic aromatic hydrocarbons (PAHs) and less than 1 mg/kg  
276 benzo[a]pyrene
- 277 (3) For plastics used in the container and the base:
- 278 (a) No substances may be added to the plastics as constituent parts, which are classified  
279 as:
    - 280 – carcinogenic of category 1 or 2 according to Table 3.2 or category 1A or 1B  
281 according to Table 3.1 of Annex VI to Regulation (EC) No 1272/2008<sup>1</sup>
    - 282 – mutagenic of category 1 or 2 according to Table 3.2 or category 1A or 1B  
283 according to Table 3.1 of Annex VI to Regulation (EC) No 1272/2008
    - 284 – toxic to reproduction of category 1 or 2 according to Table 3.2 or category 1A  
285 or 1B according to Table 3.1 of Annex VI to Regulation (EC) No 1272/2008
    - 286 – being of very high concern for other reasons according to the criteria of Annex  
287 XIII to the REACH Regulation, provided that they have been included in the  
288 List (so-called "Candidate List9) set up in accordance with REACH, Article 59,  
289 paragraph 1.
  - 290 (b) Halogenated polymers shall not be permitted. Nor may halogenated organic  
291 compounds be added as flame retardants. Moreover, no flame retardants may be  
292 added that are classified pursuant to Table 3.1 or 3.2 in Annex VI to Regulation (EC)  
293 1272/2008 as very toxic to aquatic organisms with long-term adverse effects and  
294 assigned the Hazard Statement H410 or Risk Statement R50/53.
- 295 The following shall be exempt from this rule:
- 296 – process-related, technically unavoidable impurities;
  - 297 – fluoroorganic additives (as, for example, anti-dripping agents) used to improve  
298 the physical properties of plastics, provided that they do not exceed 0.5 weight  
299 percent;

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<sup>1</sup> Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006, Annex VI Harmonized classification and labelling for certain hazardous substances, Part 3: Harmonized classification and labelling – Tables, Table 3.2, – List of harmonized classification and labelling of dangerous substances from Annex A to Directive 67/548/EEC.

300                                    -        plastic parts, less than 25 grams in mass.

301    **4.        INFORMATION REQUIREMENTS**

302    Kettles shall be accompanied by the information listed under Annex D.

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## Annex C

### Proposed Measurements methods and calculations

304  
305  
306

#### 307 **1. DEFINITIONS**

308

- 309 -  $V_{\text{rated}}$  [l]: rated water capacity of the kettle;
- 310 -  $V_{\text{min}}$  [l]: minimum water capacity of the kettle;
- 311 - E: electricity consumed until the kettle shuts off under the test condition;
- 312 -  $T_{\text{boil}}$  [°C]: boiling temperature. In the context of this test procedure,  $T_{\text{boil}}$  corresponds to a water  
313 temperature of 95°C at ambient pressure;
- 314 - Boiling: process of raising the water temperature in the vessel of the kettle from  $T_1$  up to at least  
315  $T_{\text{boil}}$ ;
- 316 -  $T_{\text{kw}}$  [°C]: average water temperature in keep-warm mode when the highest keep-warm  
317 temperature is selected;
- 318 -  $E_{T_{\text{boil}},V_{\text{rated}}}$  [Wh]: electricity consumed to heat the rated water capacity from  $T_1$  to boiling  
319 temperature. It is measured until the kettle shuts off;
- 320 -  $E_{T_{\text{boil}},1}$  [Wh]: electricity consumed to heat 1 litre of water from  $T_1$  to boiling temperature. It is  
321 measured until the kettle shuts off;
- 322 -  $E_{T_{\text{boil}},V_{\text{min}}}$  [Wh]: electricity consumed to heat the minimum water capacity from  $T_1$  to boiling  
323 temperature. It is measured until the kettle shuts off;
- 324 -  $E_{70^{\circ}\text{C},V_{\text{rated}}}$  [Wh]: electricity consumed to heat the rated water capacity from  $T_1$  until shut-off,  
325 when 70°C pre-set temperature (or the nearest pre-set temperature above 70°C) is selected. It  
326 is measured until the kettle shuts off;
- 327 -  $E_{70^{\circ}\text{C},V_{\text{min}}}$  [Wh]: electricity consumed to heat the minimum water capacity from  $T_1$  until shut-off,  
328 when 70°C pre-set temperature (or the nearest pre-set temperature above 70°C) is selected. It  
329 is measured until the kettle shuts off;
- 330 -  $P_{\text{rated}}$  [W]: rated input power
- 331 -  $P_{\text{kw},V_{\text{rated}}}$  [W]: average input power to keep warm the rated water capacity when the highest  
332 keep-warm temperature is selected;
- 333 -  $p_{\text{kw},V_{\text{rated}}}$  [W/l]: specific input power to keep warm the rated water capacity when the highest  
334 keep-warm temperature is selected;
- 335 - C: specific heat capacity of water;
- 336 -  $t_{T_{\text{boil}},V_{\text{min}}}$  [s]: time to boil the minimum water capacity. It is the time to raise the water  
337 temperature from  $T_1$  until  $T_{\text{boil}}$  is reached and the kettle shuts off;
- 338 -  $t_{T_{\text{boil}},V_{\text{rated}}}$  [s]: time to boil the rated water capacity. It is the time to raise the temperature from  
339  $T_1$  until  $T_{\text{boil}}$  is reached and the kettle shuts off;
- 340 -  $t_{T_{\text{boil}},1}$  [s]: time to boil 1 litre of water. It is the time to raise the temperature from  $T_1$  until  $T_{\text{boil}}$  is  
341 reached and the kettle shuts off;
- 342 -  $t_{70^{\circ}\text{C},V_{\text{rated}}}$  [s]: time to heat the rated water capacity when 70°C pre-set temperature (or the  
343 nearest pre-set temperature above 70°C) is selected. It is the time to raise the temperature from  
344  $T_1$  until the kettle shuts off;
- 345 -  $t_{70^{\circ}\text{C},V_{\text{min}}}$  [s]: time to heat the minimum water capacity when 70°C pre-set temperature (or the  
346 nearest pre-set temperature above 70°C) is selected. It is the time to raise the temperature from  
347  $T_1$  until the kettle shuts off;
- 348 -  $t_{\text{kwmax}}$  [min]: maximum keep-warm time;
- 349 - keep-warm: function which keeps the water temperature in the range of a pre-set temperature.
- 350 -  $P_{\text{standby}}$  [W]: power consumption in stand-by mode

- 351 -  $P_{\text{off-mode}}$  [W]: power consumption in off-mode  
 352 -  $T_{\text{drop}}$  [°C]: water temperature drop measured during the cool-down test  
 353 -  $N_{\text{cyc}}$  [-]: number of cycles carried out successfully with the same kettle during the durability test

354 **2. GENERAL CONDITIONS FOR MEASUREMENTS**

355 In this document, in order to facilitate the testing, **the quantity of cold-water indicated in litre**  
 356 **is assumed to be the same in kg.**<sup>2</sup>

357 Testing conditions:

- 358 - ambient temperature and appliance preconditioned at a temperature: 20 +/- 3°C;  
 359 - cold water temperature: 15 +/- 1°C;  
 360 - the water temperature is measured by a watertight thermocouple situated 10 mm above the  
 361 bottom centre of the water container or the highest end of the electric heating element<sup>3</sup>;  
 362 - testing room: substantially draught free.

363 **3. MEASURING METHODS**

364

365 **3.1. Definition of the energy efficiency**

366 The energy efficiency is calculated as the ratio of the theoretical energy demand needed to bring a  
 367 defined amount of cold water  $T_1$  to the target temperature  $T_2$  in relation to the measured electricity  
 368 consumed until shut-off to heat the same amount of water under the same conditions:

369

370 
$$\eta = \frac{C \cdot V \cdot (T_2 - T_1)}{E \cdot 3600}$$

371 Where:

- 372 - C: specific heat capacity of water, 4186 J/(kg.K), at 15°C and 101 kPa  
 373 - V: volume of water in l  
 374 -  $T_1$ : initial water temperature, expressed in °C;  $T_1 = 15^\circ\text{C}$  in all tests performed according to this  
 375 standard  
 376 -  $T_2$ : final water temperature, expressed in °C;  
 377 - E: electricity consumed until shut-off, expressed in Wh.

378

379 **3.2. Definition of the standardised energy consumption**

380 The standardised energy consumption (SEC) [kWh] for heating 100 litres of water is calculated as  
 381 follows:

382

383 
$$SEC = \frac{100}{1000} \cdot \frac{(30\% \cdot E_{T_{\text{boil}}, V_{\text{min}}} + 50\% \cdot E_{T_{\text{boil}}, V_{\text{rated}}} + 20\% \cdot E_{70^\circ\text{C}, V_{\text{rated}}})}{30\% \cdot V_{\text{min}} + 70\% \cdot V_{\text{rated}}} + P_{\text{standby}} \cdot \frac{8760}{1000} \cdot \frac{1}{8}$$

384 Where,

<sup>2</sup> accordingly, in the sense of this document,  $V_x$  and  $M_x$  correspond to the same quantity of water (x kg or x litre)

<sup>3</sup> in case of kettles with immersed heating element

- 385 - SEC: standardised energy consumption, expressed in kWh
- 386 -  $E_{T_{boil},V_{min}}$ : electricity consumed to heat the minimum water capacity from  $T_1$  to boiling
- 387 temperature, measured until the kettle shuts off, expressed in Wh
- 388 -  $E_{T_{boil},V_{rated}}$ : electricity consumed to heat the rated water capacity from  $T_1$  until shut-off, when
- 389 70°C pre-set temperature (or the nearest pre-set temperature above 70°C) is selected. It is
- 390 measured until the kettle shuts off, expressed in Wh
- 391 -  $E_{70^{\circ}C,V_{rated}}$ : electricity consumed to heat the rated water capacity from  $T_1$  until shut-off, when
- 392 70°C pre-set temperature (or the nearest pre-set temperature above 70°C) is selected. It is
- 393 measured until the kettle shuts off, expressed in Wh;
- 394 -  $V_{min}$ : minimum water capacity of the kettle expressed in volume, expressed in litre;
- 395 -  $V_{rated}$ : rated water capacity of the kettle, expressed in litre;
- 396 -  $P_{standby}$ : power consumption in stand-by mode, expressed in W.
- 397

### 398 3.3. Tests procedures

399

#### 400 **Test 1: Energy consumption ( $E_{T_{boil},V_{rated}}$ ) and time measurement ( $t_{T_{boil},V_{rated}}$ ) for**

#### 401 **boiling until shut-off at rated water capacity to determine the energy efficiency (EEI)**

402

403

404 Fill the kettle with cold water (15°C) to the rated water capacity level of the kettle. Start the

405 boiling process and start timing ( $t=t_s$ ). Measure the energy consumption  $E_{T_{boil},V_{rated}}$  until the

406 kettle shuts-off ( $t=t_e$ ). The water temperature has to be at least 95°C. The boiling time is

measured as:  $t_{T_{boil},V_{rated}} = t_e - t_s$  at test conditions.

407

408 Calculate the energy efficiency index as follows:

409

$$410 \quad EEI = \eta_{T_{boil},V_{rated}} = \frac{C \cdot V_{rated} \cdot (T_{boil} - T_1)}{E_{T_{boil},V_{rated}} \cdot 3600}$$

411

412 Where:

- 413 -  $\eta_{T_{boil},V_{rated}}$ : is the energy efficiency of the kettle at rated water capacity and boiling temperature.
- 414 - C: specific heat capacity of water, 4,186 J/(kg.K) at 15°C and 101 kPa
- 415 -  $V_{rated}$ : rated water capacity of a kettle, expressed in litre;
- 416 -  $T_1$ : initial water temperature, expressed in °C;  $T_1 = 15^{\circ}C$  in all tests performed according to this
- 417 test procedure
- 418 -  $T_{boil}$ : boiling temperature, expressed in °C. In the context of this test procedure,  $T_{boil}$  corresponds
- 419 to a water temperature of 95°C at ambient pressure;
- 420 -  $E_{T_{boil},V_{rated}}$ : electricity consumed to heat the rated water capacity from  $T_1$  to boiling temperature,
- 421 measured until the kettle shuts off, expressed in Wh.

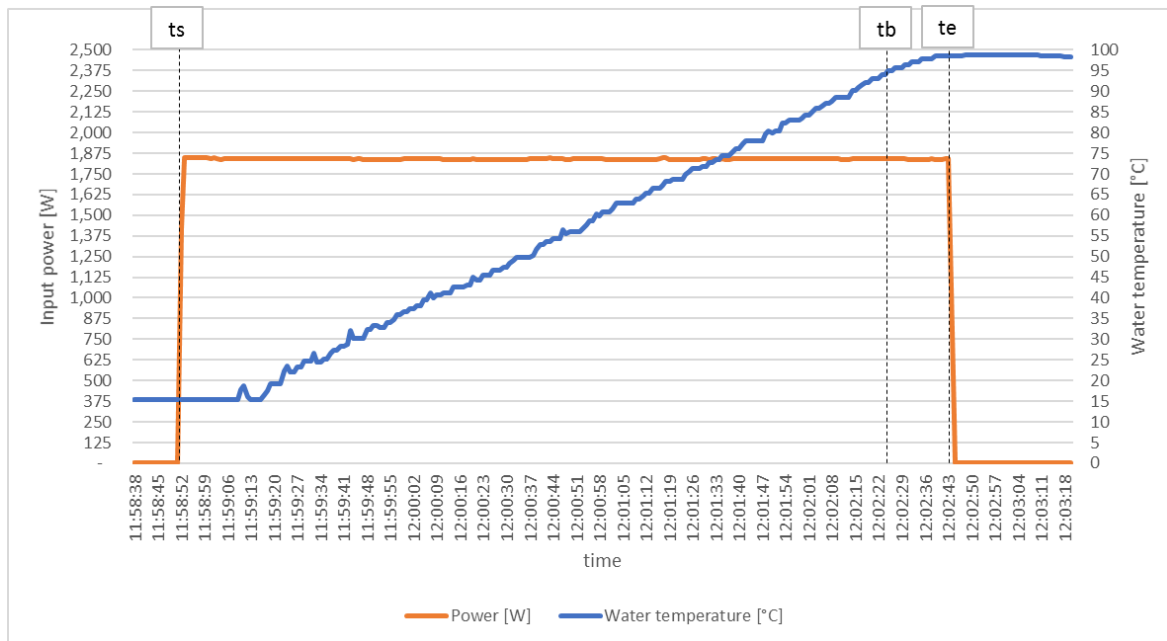
422

423 **Fehler! Verweisquelle konnte nicht gefunden werden.Fehler! Verweisquelle konnte**

424 **nicht gefunden werden.**Figure 1 shows a typical measurement for boiling test to have as an

425 example, in order to calculate the energy efficiency and the EEI of a kettle.

426



427

428

**Figure 1. Example of boiling test result measurements**

429

430 **Test 2: Energy consumption and time measurement for boiling until shut-off at**  
 431 **minimum water capacity**

432 Fill the kettle with cold water (15°C) to the minimum water capacity level of the kettle. Start  
 433 the boiling process and start timing ( $t=t_s$ ). Measure the energy consumption  $E_{T_{boil},V_{min}}$  until the  
 434 kettle shuts-off ( $t=t_e$ ). The water temperature has to be at least 95°C. The boiling time is  
 435 measured as:  $t_{T_{boil},V_{min}} = t_e - t_s$  at test conditions.

436

437 **Test 3: Energy consumption and time measurement for boiling tests until shut-off at**  
 438 **volume = 1 litre.<sup>4</sup>**

439 Fill the kettle with cold water (15°C) to 1 litre of water. Start the boiling process and start  
 440 timing ( $t=t_s$ ). Measure the energy consumption  $E_{T_{boil},1}$  until the kettle shuts off ( $t=t_e$ ). The  
 441 water temperature has to be at least 95°C. The boiling time is measured as:  $t_{T_{boil},1} = t_e - t_s$  at  
 442 test conditions.

443

444 **Test 4: Energy consumption and time measurement for heating until shut-off at pre-**  
 445 **set temperature of 70°C (or the nearest pre-set temperature above 70°C) at the**  
 446 **rated water capacity**

447 Fill the kettle with cold water (15°C) to the rated water capacity level of the kettle. Start the  
 448 heating process ( $t=t_s$ ). Measure the energy consumption  $E_{70^{\circ}C,V_{rated}}$  until the kettle shuts off  
 449 ( $t=t_e$ ). It shall be verified, that the water temperature is higher than 70°C when the kettle  
 450 shuts off ( $T_{t=t_e} \geq 70^{\circ}C$ ). The heating time is measured as  $t_{70^{\circ}C,V_{rated}} = t_e - t_s$  at the condition of  
 451 the test.

452

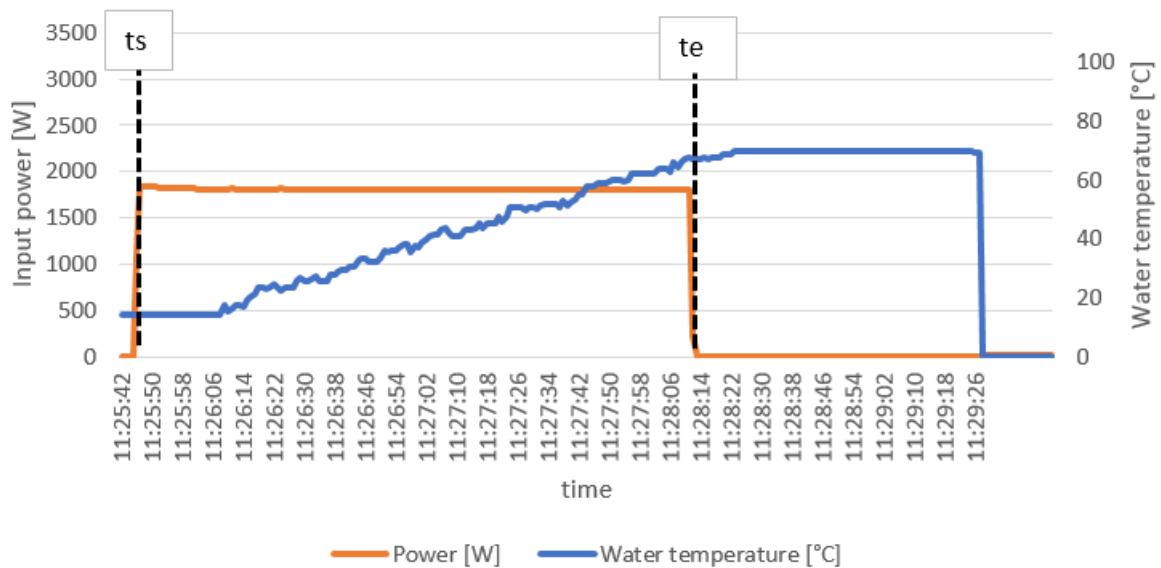
<sup>4</sup> applicable if  $V_{rated} > 1$  litre



453 **Fehler! Verweisquelle konnte nicht gefunden werden.** shows a typical energy efficiency  
 454 measurement for heating test at pre-set temperature to have as an example.

455

456



457

458 Figure 2. Example of a heating test at pre-set temperature measurements

459

460 **Test 5: Energy consumption and time measurement for heating until shut-off at pre-**  
 461 **set temperature of 70°C (or the nearest pre-set temperature above 70°C) at**  
 462 **minimum water capacity**

463 Fill the kettle with cold water (15°C) to the minimum water capacity level of the kettle. Start  
 464 the heating process ( $t=t_s$ ). Measure the energy consumption  $E_{70^\circ\text{C},V_{\text{min}}}$  until the kettle shuts off  
 465 ( $t=t_e$ ). It shall be verified, that the water temperature is higher than 70°C when the kettle  
 466 shuts off ( $T_{t=t_e} \geq 70^\circ\text{C}$ ). The heating time is measured as  $t_{70^\circ\text{C},V_{\text{min}}} = t_e - t_s$  at the condition of  
 467 the test.

468 **Test 6: Average input power, average water temperature and maximum keep warm**  
 469 **time measurement for keep warm function at maximum keep warm temperature and**  
 470 **maximum time setting at a rated water capacity**

471 Fill the kettle with cold water (15°C) to the rated water capacity level of the kettle; select the  
 472 highest pre-set temperature for keep-warm function and the longest possible keep-warm time  
 473 and start. At the end of the heating process, the keep-warm phase starts ( $t=t_{\text{kw-s}}$ ). Measure  
 474 the average input power  $P_{\text{kw}}$  and the average water temperature  $T_{\text{kw}}$  during the keep-warm  
 475 phase. Check that  $T_{\text{kw}}$  corresponds to the pre-set temperature  $\pm 3^\circ\text{C}$ . The maximum keep-  
 476 warm time  $t_{\text{kwmax}}$  is defined as  $t_{\text{kw-e}} - t_{\text{kw-s}}$ .

477

478 Calculate the specific average power input as follows:

479

480 
$$P_{\text{kw},V_{\text{rated}}} = \frac{P_{\text{kw},V_{\text{rated}}}}{V_{\text{rated}}}$$

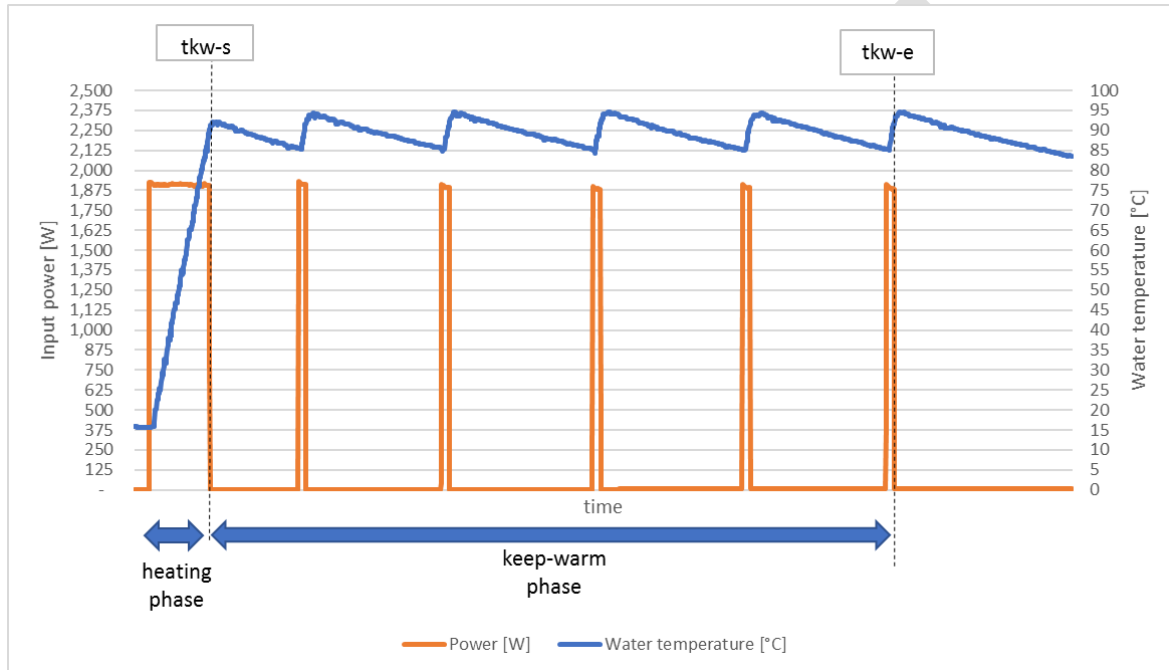
481 Where:

- 482 -  $P_{kw, V_{rated}}$ : average input power to keep warm the rated water capacity when the highest keep-
- 483 warm temperature is selected, expressed in W;
- 484 -  $V_{rated}$ : rated water capacity of a kettle, expressed in litre;
- 485 -  $p_{kw, V_{rated}}$ : specific input power to keep warm the rated water capacity when the highest keep-
- 486 warm temperature is selected, expressed in W/l.
- 487

488

489 Figure 3 shows a typical measurement of a keep-warm test.

490



491

**Figure 3. Example of keep-warm test measurements**

492

493

**Test 7: Temperature drop for cool-down 30 minutes after boiling at rated water capacity**

494

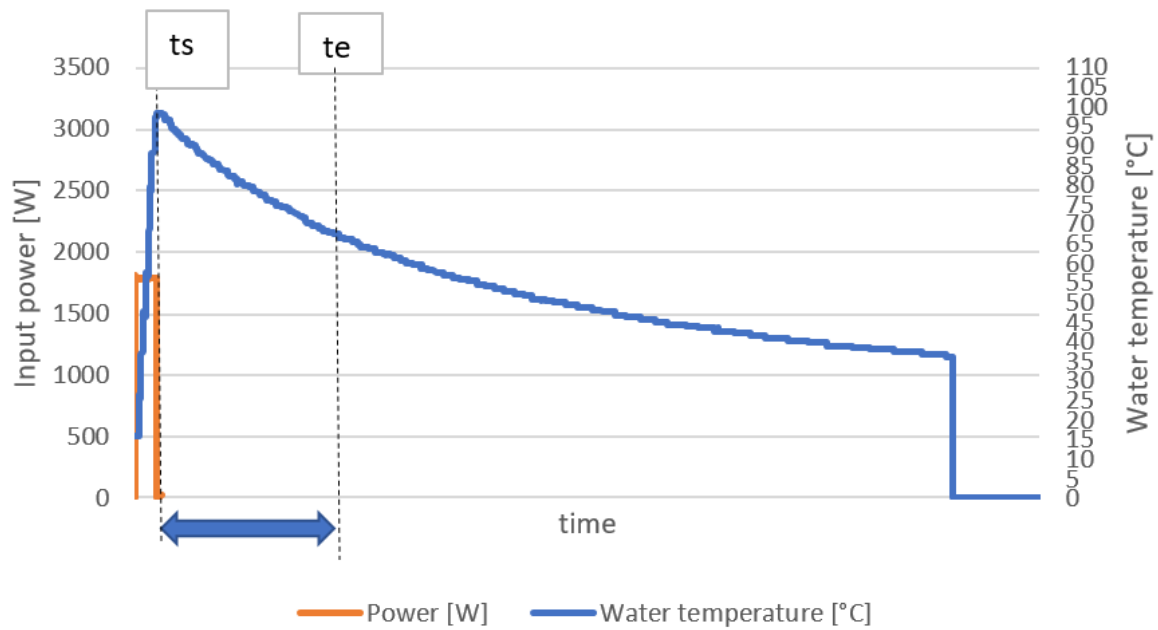
495

496

497 Fill the kettle with cold water (15°C) to the rated water capacity level of the kettle. Start the  
 498 boiling process. Measure the water temperature when the boiling process stops ( $t=t_s$ ) and  
 499 30 minutes later. Report the temperature drop  $T_{drop} = T_{(t=t_s)} - T_{(t=t_e)}$ .

500

501 Figure 4 **Fehler! Verweisquelle konnte nicht gefunden werden.** shows typical  
 502 measurements of a cool-down test to have as an example.



503

504 **Figure 4. Example of cool-down test measurements**

505

506 **Test 8: Stand-by and off-mode tests**

507 To be measured according to according to current harmonized standard.

508

508 **Test 9: Durability test**

509

509 Each cycle is defined as follows: fill in the container with 1 litre of cold water and boil the  
 510 water, check that the water temperature could at least reach 95°C. After the kettle shuts off,  
 511 pour the water out. The kettle shall work normally, meaning the power switch shall operate  
 512 smoothly; the lid shall open and close without smoothly, the container has no leak. Repeat  
 513 the cycle and when required, descale the kettle.

514

514 The maximum number of cycles carried out successfully with the same kettles is  $N_{cyc}$ .

515

515 Table 1 shows a summary of the required test measurements and calculations.

516

517

518

519

520

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525

526 **Table 1. Overview of the test conditions and calculation of the results**

Test number	Type of test	Quantity of water	Measurement	Parameters measured or calculated
Test 1	Boiling	Rated water capacity	Until shut-off (at least $T_{\text{boil}}$ )	$E_{T_{\text{boil}},V_{\text{rated}}}$ $t_{T_{\text{boil}},V_{\text{rated}}}$ EEI
Test 2	Boiling	Minimum water capacity	Until shut-off (at least $T_{\text{boil}}$ )	$E_{T_{\text{boil}},V_{\text{min}}}$ $t_{T_{\text{boil}},V_{\text{min}}}$
Test 3	Boiling	1 litre (*)	Until shut-off (at least $T_{\text{boil}}$ )	$E_{T_{\text{boil}},1}$ $t_{T_{\text{boil}},1}$
Test 4	Heating	Rated water capacity	Until shut-off, when 70°C pre-set temperature (or the nearest pre-set temperature above 70°C) is selected	$E_{70^{\circ}\text{C},V_{\text{rated}}}$ $t_{70^{\circ}\text{C},V_{\text{rated}}}$
Test 5	Heating	Minimum water capacity	Until shut-off, when 70°C pre-set temperature (or the nearest pre-set temperature above 70°C) is selected	$E_{70^{\circ}\text{C},V_{\text{min}}}$ $t_{70^{\circ}\text{C},V_{\text{min}}}$
Test 6	Keep-warm	Rated water capacity	Max keep-warm temperature selected  Longest possible keep-warm time	$t_{\text{kwmax}}$ $T_{\text{kw}}$ $P_{\text{kw},V_{\text{rated}}}$ $\rho_{\text{kw},V_{\text{rated}}}$
Test 7	Cool down	Rated water capacity		$T_{\text{drop}}$
Test 8	Standby	0 litre	According to current harmonized standard	$P_{\text{standby}}$
Test 9	Durability	1 litre (or $V_{\text{rated}}$ if $V_{\text{rated}} > 1\text{litre}$ )	Until shut-off (at least $T_{\text{boil}}$ )	$N_{\text{cyc}}$

527 n.a. not applicable

528 \* applicable if  $V_{\text{rated}} > 1$  litre

529

530 **Definition of the recyclability rate**

531 The recyclability rate  $R_{\text{cyc}}$  is assessed according to EN 45555:2019 "General methods for  
532 assessing the recyclability and recoverability of energy-related products".

533

534 **Definition of the post-consumer materials content**

535 The post-consumer materials content  $R_{\text{post}}$  is assessed according to EN 45557:2020 "General  
536 method for assessing the proportion of recycled material content in energy-related products".

537

**Annex D**


538

**Proposed Information requirements**

539 The product manufacturer, importer or authorised representative shall make available the following  
 540 information in a printed format with the product and online, either through the product database set  
 541 up pursuant to Article 12 of Regulation (EU) 2017/1369 or on a free-access website.

542

543 **Table 2: Product information sheet**

 <b>ELECTRIC KETTLE</b>	
<b>Supplier's name or trade mark:</b>	
<b>Supplier's address:</b>	
<b>Model identifier:</b>	
<b>Made in: [Add country where the appliance is assembled]</b>	
<b>1. Recommendations</b>	<p><i>Ensuring that only the required amount of water is heated to the required temperature can significantly reduce the energy use of your kettle, save time and money (see below under points 3 and 4)</i></p> <p><i>Descale the kettle regularly, since limescale deposit will reduce the energy efficiency and the lifetime of your appliance</i></p> <p><i>If your kettle is damaged or no longer working, it may be repaired. See information regarding spare parts availability under point 5</i></p>
<b>2. General information</b>	
<b>Parameter</b>	<b>Value</b>
Keep-warm function	YES/NO
Type of heating element	Concealed/Immersed
Rated capacity in l [ $V_{rated}$ ]	X,X
Rated power in W [ $P_{rated}$ ]	X
Standby consumptions in W [ $P_{standby}$ ]	X
Temperature settings	[No], [T1, T2,...], [Tmin-Tmax], [Tmin-Tmax with x °C step]
Standardised energy consumption [SEC], in kWh <sup>1</sup>	XXXX,XX
Specific keep-warm power at maximum temperature and rated volume [ $p_{kw}, V_{rated}$ ] in W/l <sup>2</sup>	XX,XX

Maximum keep warm time [ $t_{KWmax}$ ], in min <sup>2</sup>	XXXX	
Temperature decrease after 30 min [ $T_{drop}$ ], in °C <sup>3</sup>	XX	
Rated number of cycles	XXXXX	
Environmental label(s) obtained	Indicate which if any.	
GHG offsetting certificates obtained	Indicate which if any	
Guarantee duration, in years		
Recyclability rate [Rcyc] (>= 75% required)	XX %	
Post-consumer material content [Rpost]	XX %	
<b>3. Energy consumption in Wh</b>		
Water volume in litre	[replace by 70°C pre-set temperature (or the nearest pre-set temperature above 70°C)]**	Boiling (until automatic shut-off)
[replace by $V_{min}$ ]		
1.0 [remove if $V_{rated} = <1$ ]		
[replace by $V_{rated}$ ]		
<b>4. Time required (in s)</b>		
Water volume in litre	[replace by 70°C pre-set temperature (or the nearest pre-set temperature above 70°C)]**	Boiling (until automatic shut-off)
[replace by $V_{min}$ ]		
1 [remove if $V_{rated} = <1$ ]		
[replace by $V_{rated}$ ]		
<b>5. Spare parts</b>		
Spare parts ordering information	website	
List of available spare parts (also after the time of guarantee)*		

Name	Part number	Available	Professional required for reparation/change	Maximum Price
<b>Lid</b>				
<b>Limescale filter</b>				
<b>Container</b>				
<b>Base</b>				

544 <sup>1</sup> As set in Annex C, section 3.2

545 <sup>2</sup> As set in Annex C, section 3.3, Test 6.

546 <sup>3</sup> As set in Annex C, section 3.3, Test 7.

547 \* Add additional spare parts in the list if applicable

548 \*\* only applicable for kettle with temperature pre-setting

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549 **GETTING IN TOUCH WITH THE EU**

550 **In person**

551 All over the European Union, there are hundreds of Europe Direct information centres. You  
552 can find the address of the centre nearest you at: [https://europa.eu/european-](https://europa.eu/european-union/contact/meet-us_en)  
553 [union/contact/meet-us\\_en](https://europa.eu/european-union/contact/meet-us_en)

554

555 **On the phone or by email**

556 Europe Direct is a service that answers your questions about the European Union. You can  
557 contact this service:

558 - by Freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),

559 - at the following standard number: +32 2 299 96 96, or

560 - by email via: [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)

561

562

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565 the Europa website at: [https://europa.eu/european-union/index\\_en](https://europa.eu/european-union/index_en)

566

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569 <https://publications.europa.eu/en/publications>.

570

571 Multiple copies of free publications may be obtained by contacting Europe Direct or your  
572 local information centre (see [https://europa.eu/european-union/contact/meet-us\\_en](https://europa.eu/european-union/contact/meet-us_en) ).

573

574 **EU law and related documents**

575 For access to legal information from the EU, including all EU law since 1952 in all the official  
576 language versions, go to EUR-Lex at: <http://eur-lex.europa.eu>

577

578 **Open data from the EU**

579 The EU Open Data Portal (<http://data.europa.eu/euodp/en>) provides access to datasets  
580 from the EU. Data can be downloaded and reused for free, for both commercial and non-  
581 commercial purposes.

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