



# SLOVENSKI STANDARD

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Nadomešča:

SIST EN 50242:2008

SIST EN 50242:2008/A11:2012

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**Električni pomivalni stroji za gospodinjstva - Preskusne metode za merjenje lastnosti**

Electric dishwashers for household use - Test methods for measuring the performance

Lave-vaisselle électriques à usage domestique - Méthodes de mesure de l'aptitude à la fonction

**Ta slovenski standard je istoveten z: prEN 50242:2015**

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**ICS:**

97.040.40

Pomivalni stroji

Dishwashers

**oSIST prEN 50242:2016**

**en,fr**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 50242**

December 2015

ICS 97.040.40

Will supersede EN 50242:2008

English Version

**Electric dishwashers for household use - Test methods for  
measuring the performance  
(IEC 60436:2004 , modified + A2:2012 , modified + A1:2009 ,  
modified)**

Lave-vaisselle électriques à usage domestique - Méthodes  
de mesure de l'aptitude à la fonction  
(IEC 60436:2004 , modifiée + A2:2012 , modifiée + A1:2009  
, modifiée)

To be completed  
(IEC 60436:2004 , modifiziert + A2:2012 , modifiziert +  
A1:2009 , modifiziert)

This draft European Standard is submitted to CENELEC members for enquiry.  
Deadline for CENELEC: 2016-03-04.

The text of this draft consists of the text of IEC 60436:2004 + A2:2012 + A1:2009.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).

A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

prEN 50242:2015 (E)  
prEN 60436:2015 (E)

## 1 European foreword

2 This document (prEN 50242:2015 / prEN 60436:2015) consists of the text of IEC 60436:2004,  
3 IEC 60436:2004/A1:2009 and IEC 60436:2004/A2:2012 prepared by SC 59A "Electric dishwashers" of  
4 IEC/TC 59 "Performance of household and similar electrical appliances", together with the common  
5 modifications prepared by CLC/TC 59X "Performance of household and similar electrical appliances".

6 This document is currently submitted to the enquiry.

7 The following dates are proposed:

- latest date by which the existence of this document (doa) dor + 6 months  
has to be announced at national level
- latest date by which this document has to be implemented (dop) dor + 12 months  
at national level by publication of an identical  
national standard or by endorsement
- latest date by which the national standards conflicting (dow) dor + 24 months  
with this document have to be withdrawn (to be confirmed or  
modified when voting)

8

9 This document will supersede EN 50242:2008 / EN 60436:2008.

10 prEN 50242:2015 / prEN 60436:2015 includes the following significant technical changes with respect to  
11 EN 50242:2008 / EN 60436:2008:

- 12 a) introduction of new combined cleaning and drying performance assessment (Clause 7);
- 13 b) new data on expanded measurement uncertainty (Annex ZB);
- 14 c) new Annexes ZZA, ZZB and ZZC.

15 Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60436:2004,  
16 IEC 60436:2004/A1:2009 and IEC 60436:2004/A2:2012 are prefixed "Z".

17 Clauses, subclauses, notes, tables, figures and annexes which are new common modifications are  
18 **written in red letters.**

19 This document has been prepared under a mandate given to CENELEC by the European Commission  
20 and the European Free Trade Association, and supports essential requirements of EU Directive(s).

21 For the relationship with Regulations (EU) No 1059/2010, (EU) No 1016/2010 and (EC) No 1275/2008,  
22 see informative Annexes ZZA, ZZB and ZZC, which are integral parts of this document.

23

**Text of prEN 50242:2015 / prEN 60436:2015**

24 The text of this draft European Standard consists of the text of the International Standard  
25 IEC 60436:2004, IEC 60436:2004/A1:2009 and IEC 60436:2004/A2:2012 including the common  
26 modifications written in red letters.

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## 27 Introduction

28 This new edition of EN 50242 / EN 60436 has been developed based on the mandate M/481 to CEN,  
29 CENELEC and ETSI for standardisation in the field of household dishwashers, which relates to  
30 Directive 2009/125/EC of the European Parliament and of the Council and to Directive 2010/30/EU of the  
31 European Parliament and of the Council.

32 Mandate M/481, issued by the European Commission, includes the standardisation task to develop  
33 measures in testing household dishwashers, which ensure "that the prospective harmonised standard(s)  
34 includes a procedure that avoids an appliance being programmed to recognize the test cycles, and  
35 reacting specifically to them, with the exclusion of test cycle recognition that is active only during the  
36 manufacturing of the appliance".

37 CLC/TC 59X/WG 2 has identified the deviating test conditions in the previous edition of this standard for  
38 the cleaning performance assessment (soiled test load), including relevant energy and water  
39 consumption measurements, and the drying performance assessment (unsoiled test load), excluding  
40 energy and water consumption measurements, to be the main potential source for an appliance being  
41 programmed to recognize the test cycle, and reacting specifically to them. Therefore, the Combined  
42 Cleaning and Drying evaluation (CCD) has been established to repeal former deviating test conditions,  
43 and to improve alignment with common real life household conditions.

44 This document submits all common modifications necessary for the application of  
45 IEC 60436:2004/A1:2009 and IEC 60436:2004/A2:2012 in Europe. Accordingly, it incorporates the  
46 changes made in EN 50242:2008/A11:2012 / EN 60436:2008/A11:2012.

47 In addition, this document submits modifications to Annex O "Additional aspects of the energy  
48 consumption of dishwashers" based on the FDIS draft of IEC 60436 4th Edition prepared by SC 59A  
49 "Electric dishwashers" of IEC/TC 59 "Performance of household and similar electrical appliances".

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**1 Scope**

In the first sentence of the first paragraph, **replace** 'International Standard' by 'European Standard'.

**2 Normative references**

**Add** the following new references:

EN 50564:2011, *Electrical and electronic household and office equipment – Measurement of low power consumption* (IEC 62301:2011, modified)

EN ISO 80000-1:2013, *Quantities and units – Part 1: General* (ISO 80000-1:2009 + Cor 1:2011)

ISO 3310 series, *Test sieves - Technical requirements and testing*

**Modify** the referenced documents as follows:

EN 60350, *Electric cooking ranges, hobs, ovens and grills for household use – Methods for measuring performance* (IEC 60350)

EN 60704-2-3, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 2-3: Particular requirements for dishwashers* (IEC 60704-2-3)

EN 60704-3, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 3: Procedure for determining and verifying declared noise emission values* (IEC 60704-3)

EN 60705, *Household microwave ovens – Methods for measuring performance* (IEC 60705)

EN 60734, *Household electrical appliances – Performance – Hard water for testing* (IEC 60734)

**3 Terms and definitions**

**Replace** the heading of Clause 3 by the following:

**3 Definitions related to the appliance****3.16  
off mode**

Delete the Note 2.

**3.17  
left on mode**

Replace first sentence by:

the lowest power consumption mode that may persist for an indefinite time after the completion of the programme, opened and unlatched door without any further intervention of the user.

**3.18  
delay start mode**

Delete the note

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82 *Add the following new definitions:*

83 **3.Z1**

84 **left on mode duration**

85 time for the dishwasher to revert automatically to off mode after the end of the programme with the door  
86 unlatched and opened; mode applies if the test dishwasher is equipped with a power management  
87 system

88 Note 1 to entry: The left on mode duration is declared by the manufacturer.

89 Note 2 to entry: End of programme is reached when end of programme indicator is activated or when all activities cease if there  
90 is no end of programme indicator (according to 3.6 and 3.7).

91 **3.Z2**

92 **power management system**

93 system within the test dishwasher which allows it to revert automatically to off mode

94 **4 List of measurements**

95 *Modify the first bullet point as follows:*

96 - the ~~cleaning~~ combined cleaning and drying performance according to Clause 6 and Clause 7.

97 *Delete the second bullet point.*

98 **5.1 General**

99 *Replace the last sentence of the second paragraph by:*

100 The reference machine shall be in accordance with the description given in Annex E or Annex N  
101 respectively.

102 *Add a new paragraph after the last sentence:*

103 Rounding shall only be applied to reported values in Clause Z1, Clause Z2 and Annex L. If numbers have  
104 to be rounded, they shall be rounded to the nearest number according to EN ISO 80000-1:2013, B.3 Rule  
105 B. If the rounding takes place to the right of the comma, the omitted places shall not be filled with zeros.

106 **5.1.1 Free standing dishwashers**

107 *Replace the second sentence by the following:*

108 The dishwasher manufacturer's instructions regarding installation and use of the dishwasher shall be  
109 followed.

110 **5.2 Conditioning of the machine under test and sequence of test procedures**

111 *Modify the two paragraphs of the subclause as follows:*

112 Before conducting the performance tests, the dishwasher shall be operated for at least three complete  
113 cycles using no load or a clean load with reference detergent (specified in 5.7) and with rinse agent  
114 (specified in 5.8). If noise measurements should be done, they should be carried out before any  
115 performance measurements and in accordance to Clause 8. No additional cycles shall be carried out on  
116 the machine under test between the sequential steps specified in the following procedure.

117 The tests of cleaning performance and drying performance shall be performed simultaneously. The  
118 determination of energy, water and cycle/programme time (Clause 8) shall be done in conjunction with  
119 the combined cleaning and drying performance (Clauses 6 and 7) tests.



**5.3 Electricity supply for machines**

*Replace the text of Subclause 5.3.1.1 Voltage by the following:*

The supply voltage shall be maintained at  $230\text{ V} \pm 1\%$ .

The supply voltage measured during the tests shall be recorded.

*Modify Subclause 5.3.2.1 Voltage as follows:*

The supply voltage shall be set at  $230\text{ V}$  a.c. and maintained within  $\pm 1\%$  throughout the test. The measured voltage shall be reported.

**5.4 Test programme**

*Replace the first sentence of the first paragraph by:*

For energy labelling and / or ecodesign purposes the programme to be tested shall be the cycle which cleans normally soiled tableware (standard cleaning and drying cycle) and shall be named "eco". The name "eco" shall be used once and exclusively for this standard test programme. The only other additional information which could be combined with the term "eco" is temperature.

*Replace the text of the note by:*

The formatting of the phrase "eco" is not restricted in terms of font, font size, case sensitivity, colour or accentuations like the usage of italic letter or underlining etc.

*Modify the 2<sup>nd</sup> paragraph as follows:*

The same programme shall be used for measuring the ~~cleaning performance according to Clause 6, the drying performance according to Clause 7, combined cleaning and drying performance according to Clauses 6 and 7, the energy and water consumption and time according to Clause 8, and the noise according to Clause 9, if tested.~~

**5.5 Ambient conditions**

*For both drying methods, replace " $(20 \pm 2)^\circ\text{C}$ " by " $(23 \pm 2)^\circ\text{C}$ ".*

*For the oven drying method, replace " $(55 \pm 10)\% \text{ RH}$ " by " $(55 \pm 5)\% \text{ RH}$ ".*

*Add the following sentence after the last paragraph:*

For energy labelling and / or ecodesign purposes, the air-dry method is not permitted.

**5.6.2 Water supply – Temperature**

*Add the following paragraph after the list:*

The volume of the water pipe after the measurement device for temperature up to the connection point to the water inlet hose of the test dishwasher shall not exceed 250 ml.

If a bypass to drain water is installed at each connection to the water inlet hose(s) of the dishwasher the bypass shall be opened before starting tests until the water inlet temperature is in the required range. If the temperature is measured in the circulation loop, the volume of the spur taking the water from the circulation loop shall not exceed 250 ml.

For energy labelling and / or ecodesign purposes, the use of hot water is not permitted.

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### 155 5.6.3 Hardness

156 *In the 2<sup>nd</sup> sentence of the first paragraph, **replace** 'IEC 60734' by '**EN 60734**'.*

157 ***Add** the following sentences after the first paragraph:*

158 *For energy labelling and / or ecodesign purposes, if the appliance is not equipped with a water softener,*  
159 *the hardest water which is permitted by the manufacturer's instructions shall be used, otherwise only*  
160 *water of  $(2,5 \pm 0,5)$  mmol/l shall be used.*

### 161 5.7 Detergent

162 ***Replace** the text of the paragraph by the following:*

163 *For energy labelling and / or ecodesign purposes, the reference detergent B, as described in Annex D,*  
164 *shall be used.*

165 *The quantity shall be as recommended by the manufacturer, but it shall not be more than*

- 166 *– 2,5 g/place setting for dishwashers with a capacity of > 10 place settings;*
- 167 *– 3,0 g/place setting for dishwashers with a capacity of < 10 place settings.*

168 *If no recommendation is given by the manufacturer, use*

- 169 *– 2,0 g/place setting for dishwashers with a capacity of > 10 place settings;*
- 170 *– 2,5 g/place setting for dishwashers with a capacity of < 10 place settings.*

171 *The total quantity of detergent, in grams, used for main wash and pre-wash during the tests shall be*  
172 *recorded.*

173 *The detergent shall be placed in the dishwasher immediately prior to starting the programme. If a*  
174 *dispenser is incorporated in the dishwasher, it shall be used. The dispenser shall be clean and dry prior to*  
175 *the placement of detergent. In the absence of manufacturer's recommendations, the detergent shall be*  
176 *placed in the main compartment of the dispenser.*

177 *Detergent from the same batch shall be used for the dishwasher under test and for the reference*  
178 *dishwasher.*

179 *The detergent shall be stored in waterproof bags in quantities of no more than 1 kg in a cool and dry*  
180 *atmosphere. It shall be used within six months after production and within one month of opening.*

181 *Before using, the detergent shall be homogenized in accordance with ISO 607 for example using a*  
182 *sample dividing device.*

183 *NOTE For a supplier of a suitable sample dividing device, see Annex F.*

### 184 5.8 Rinse agent

185 ***Add** the following sentence between the first paragraph and NOTE 1:*

186 *For energy labelling and / or ecodesign purposes, only Formula III rinse aid (acidic) shall be used.*

**6 Cleaning performance**

*Modify the heading of Clause 6 as follows:*

**Cleaning performance Combined cleaning and drying performance tests****6.1 General and purpose**

*Replace the 1<sup>st</sup> sentence by the following:*

The purpose of this test is to measure how well the appliance cleans **and dries** normally soiled place settings and serving pieces.

*Replace the first sentence of the second paragraph by:*

The tests are carried out in parallel with one of the reference machines specified in Annex E or Annex N.

*Add the following new paragraph between the last paragraph and the Note:*

For details of preparation, the instructions of the video available by the supplier given in Annex F shall be followed. Additionally, Annex N contains pictures of typical soilings.

**6.2 Load**

*Add between the first and second paragraph the following:*

For energy labelling and / or ecodesign purposes, test load items according to Annex A shall be used.

*Modify Note 2 as follows:*

NOTE 2 Reconditioning in a dishwasher should be done using detergent B (refer to Annex D).

*Add after the last paragraph the following new paragraphs:*

The items should be used for not more than 200 cycles where soiling is applied.

After each combined cleaning and drying performance test with five to eight cycles a special normalization cycle shall be performed in order to avoid residual scale formation on the test load. For this purpose clean load is loaded into a dishwasher (no test or reference machine) having a normal / daily use programme. This programme is run with 30 g of anhydrous fine granular citric acid (Supplier see F.Z2) instead of detergent for one cycle.

In case new test load is started to use in the tests, ten cycles using detergent (specified in 5.7) and rinse aid (specified in 5.7) shall be performed in order to avoid the deviations in the test results of tests performed with new load and used load.

Soup plates (specified in A.2) soiled with oat flakes (specified in 6.4.5) shall be free of starch residues from the previous tests.

NOTE 3 This can be checked by Lugols solution after each cleaning performance test. Lugols solution is a 1 % Iodine/potassium iodide solution (Merck 109261), which may be obtained from supplier mentioned in F.Z2.

**6.3 Soiling agents**

*Add the following new paragraphs after the last paragraph of 6.3:*

All soiling materials used for the reference machine and for the machine under test shall be from the same batch.

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222 For energy labelling and / or ecodesign purposes, it is necessary that the soilings have the same  
223 properties in all laboratories to ensure comparable and reproducible results.

224 Soilings from the same batch are offered by the supplier mentioned in F.14.

225 *Delete the last sentence of the subclause.*

## 226 **6.4 Preparation and application of soiling agents**

227 *Modify the first sentence of the first paragraph as follows:*

228 Unless specifically stated otherwise, all soiling agents are to be freshly prepared for each test and have to  
229 be finally prepared and applied to the test items at the date of testing.

230 *Add the following Note after Note 1:*

231 **NOTE 2** Refer to Annex ZA for illustration of soiling.

### 232 **6.4.1.1 Items required for preparation**

233 *Add the following sentence at the end of the first bullet point:*

234 For energy labelling and / or ecodesign purposes, only UHT milk shall be used.

235 *Modify the last bullet point as follows:*

236 – Pipette (10 ml) (see F.Z1)

### 237 **6.4.1.2 Conversion**

238 *Replace the entire paragraph by the following:*

239 If the power levels of the microwave oven used are not equal to the rated values (780 W and 150 W)  
240 according to Annex G but within the given tolerances the heating times shall be corrected as follows:

Bosch model HMT752F <sup>1)</sup>

Approved microwave oven for tests  
(e.g. Bosch HMT742C; HMT743C; HMT75M42 <sup>1)</sup>)

$$t_{u,1} = \frac{P_1 \cdot t_1}{P_{u,1}}$$

$$t_{u,1} = \frac{P_1 \cdot Z}{P_{u,1}} \quad (Z1)$$

$$t_{u,2} = \frac{P_2 \cdot t_2}{P_{u,2}}$$

$$t_{u,2} = \frac{P_2 \cdot t_2}{P_{u,2}} \quad (Z2)$$

241 **where**

242  $P_1$  is 780 W;

243  $P_2$  is 150 W;

244  $t_1$  is 4 min;

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1) "Bosch HMT,," is the trade name of a product supplied by Bosch. This information is provided for the convenience of users of this European Standard and does not constitute an endorsement by the CENELEC of this trademark. Items of the similar specification may be used if they can be shown to lead to equivalent results.

- 245  $t_2$  is 10 min;
- 246  $Z$  is the recommended time setting in min in the attached data sheet which will be delivered  
247 together with the microwave oven as described in G.1;
- 248  $P_{u,1}$  is the actual max. power level used in W (measured according to EN 60705);
- 249  $t_{u,1}$  is the corresponding heating time to be used in min;
- 250  $P_{u,2}$  is the actual reduced power level used in W [determined by equation (Z3)];
- 251  $t_{u,2}$  is the corresponding actual heating time to be used in min.

$$252 \quad P_{u,2} = \frac{P_{u,1}}{t_p} (t_{on} - t_{up}) \quad (Z3)$$

253 where

- 254  $t_p$  is the time of the elementary period of the magnetron in the microwave oven at the  
255 reduced power level in s;
- 256  $t_{on}$  is the time the microwave oven is on within the elementary period in s;
- 257  $t_{up}$  is 1,6 s, which is the magnetron filament heating-up time.

258 Use levels, which are close to the rated levels.

#### 259 6.4.1.3 Pre-heating the microwave oven

260 **Replace** the content of the subclause by the following:

261 Before cooking the milk in the glasses, heat up the microwave oven as follows:

- 262 • Place six glasses, each filled with 50 ml of water, in the microwave oven;
- 263 • Place the glasses symmetrically in a circle of 160 mm diameter (centre of the circle = centre of the  
264 glass turntable). See Figure 1.
- 265 • Operate the microwave oven for 4 min or respectively  $Z$  min depending on the oven type (see above)  
266 at a power level of 780 W and then for 10 min at a power level of 150 W, or at the corrected cooking  
267 times calculated above for the power level used. The time  $Z$  can be found in the technical instructions  
268 for the particular microwave.

269 After pre-cooking, take the water-filled glasses out of the microwave oven.

#### 270 6.4.1.4 Application

271 **Add** the following between the first and the second paragraph:

272 It is recommended to use the pipette of Socorex Company. Details are given in F.Z1.

#### 273 6.4.1.5 Cooking process

274 **Modify** the third and fourth paragraphs:

275 After the cooking period in the microwave oven, the colour of the cooked milk shall be compared with the  
276 shade chart in Annex K. The colour at the bottom of the glass shall have at least colour of shade No. 4 on  
277 the shade chart and not exceed colour of shade No. 6.

278 Small areas of the milk skin shall not be darker than colour of shade No. 12 on the shade chart.

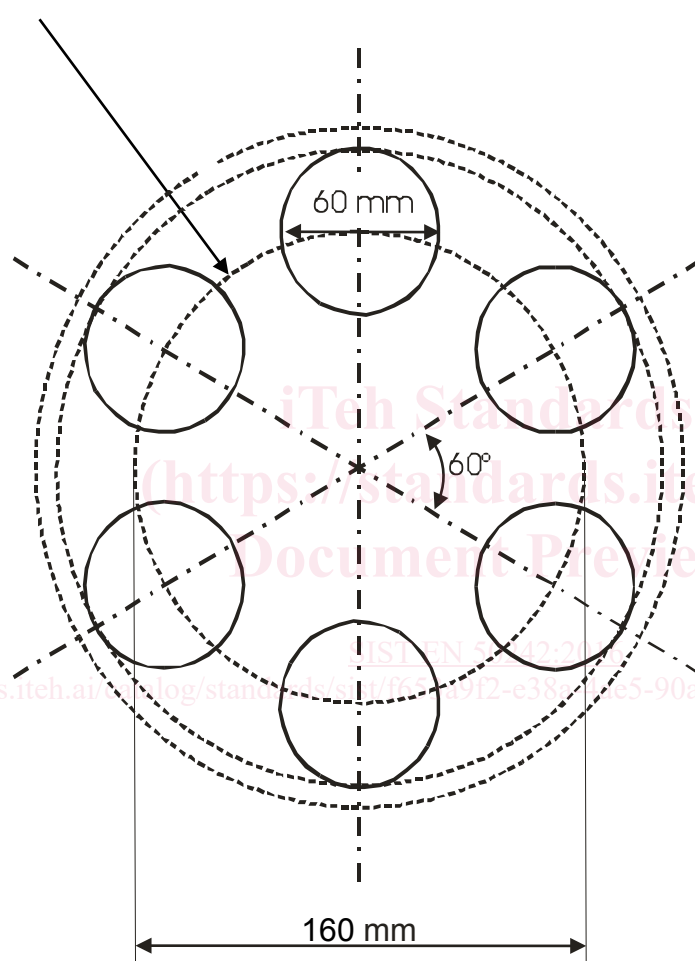
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279 **Add** the following after the fourth paragraph:

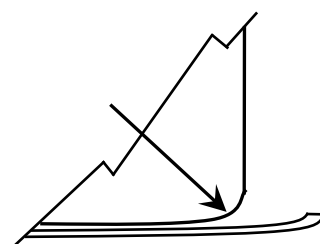
280 For colour comparing only original colour sheets shall be used, which may be obtained from supplier  
281 mentioned in F.7.

282 **Replace** Figure 1 as follows:

Centre of the beakers to lie  
on a circle of 160 mm



The beaker shall remain  
flat and flush on the platter  
surface.



**Figure 1 – Position of the glasses on the microwave turntable**

#### 285 6.4.2 Tea

286 **Add** the following sentence at the end of the subclause:

287 For energy labelling and / or ecodesign purposes, only black tea as described in Annex F shall be used.