



# SLOVENSKI STANDARD

## SIST EN 60661:2014

01-junij-2014

Nadomešča:

SIST EN 60661:2002

SIST EN 60661:2002/A1:2003

SIST EN 60661:2002/A2:2006

---

**Metode za merjenje lastnosti električnih gospodinskih aparatov za pripravo kave  
(IEC 60661:1999 (MOD) + A1:2003 (MOD) + A2:2005 (MOD))**

Methods for measuring the performance of electric household coffee makers

**iTeh STANDARD PREVIEW**

Verfahren zur Messung der Gebrauchseigenschaften elektrischer Haushalt-Kaffeebereiter

[SIST EN 60661:2014](https://standards.iteh.ai/catalog/standards/sist/4a35e938-616c-4c7f-af2d-5061520ad59/sist-en-60661-2014)

Méthodes de mesure de l'aptitude à la fonction des cafetières électriques à usage domestique

**Ta slovenski standard je istoveten z: EN 60661:2014**

---

**ICS:**

97.040.50      Majhni gospodinski aparati      Small kitchen appliances

**SIST EN 60661:2014**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 60661:2014](#)

<https://standards.iteh.ai/catalog/standards/sist/4a35e938-616c-4c7f-af2d-50bf520fad55/sist-en-60661-2014>

EUROPEAN STANDARD

**EN 60661**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2014

ICS 97.040.50

Supersedes EN 60661:2001

English Version

Methods for measuring the performance of electric household  
coffee makers  
(IEC 60661:1999 , modified + A1:2003 , modified + A2:2005 ,  
modified)

Méthodes de mesure de l'aptitude à la fonction des  
cafetières électriques à usage domestique  
(CEI 60661:1999 , modifiée + A1:2003 , modifiée +  
A2:2005 , modifi)

Verfahren zur Messung der Gebrauchseigenschaften  
elektrischer Haushalt-Kaffeebereiter  
(IEC 60661:1999 , modifiziert + A1:2003 , modifiziert +  
A2:2005 , modifiziert)

This European Standard was approved by CENELEC on 2013-11-25. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists 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.

SIST EN 60661:2014

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.



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**

## Contents

Page

Foreword .....	3
1 Addition of an Introduction .....	4
2 Modification to Clause 1 "Scope and object" .....	4
3 Modification to Clause 2 "Normative references" .....	4
4 Modifications to Clause 3 "Definitions" .....	4
5 Modification to 23.2 "Taste of the coffee" .....	5
6 Modification to Clause 25 "Descaling test" .....	5
7 Modification to Clause 26 "Energy consumption" .....	5
8 Modification to 27.1 "Steam function to froth-up milk" .....	14
9 Modification to 27.2 "Steam function to heat-up water" .....	14
10 Addition of "Annex ZA (normative) Specification of cups" .....	15
11 Addition of Bibliography .....	17

**iteh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 60661:2014](https://standards.iteh.ai/catalog/standards/sist/4a35e938-616c-4c7f-af2d-50b520fad55/sist-en-60661-2014)

<https://standards.iteh.ai/catalog/standards/sist/4a35e938-616c-4c7f-af2d-50b520fad55/sist-en-60661-2014>

## Foreword

This document (EN 60661:2014) consists of the text of IEC 60661:1999 + A1:2003 + A2:2005 prepared by IEC/SC 59G "Small kitchen appliances" (merged in IEC/SC 59L) and IEC/SC 59L "Small household appliances" of IEC TC 59 "Performance of household and similar electrical appliances", together with the common modifications prepared by working group CLC/TC 59X/WG 15 "Coffee makers" of CLC/TC 59X "Performance of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented (dop) 2015-05-02  
at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2016-11-25

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60661:1999 + A1:2003 + A2:2005 are prefixed "Z".

This document supersedes EN 60661:2001 + A1:2003 + A2:2005.

EN 60661:2014 includes the following significant technical changes with respect to EN 60661:2001 and its amendments: EN 60661:2014 now takes into account Mandate M/495 "Standardisation mandate to CEN, CENELEC and ETSI under Directive 2009/125/EC relating to harmonised standards in the field of Ecodesign" and its Annex A.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

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

## Endorsement notice

The text of the International Standard IEC 60661:1999 + A1:2003 + A2:2005 was approved by CENELEC as a European Standard with agreed common modifications.

## 1 Addition of an Introduction

*Add the following between the foreword and Clause 1:*

### Introduction

IEC 60661:2006-02 (consolidated edition of IEC 60661:1999 + A1:2003 + A2:2005) focuses mainly on filter coffee makers; capsule & pad makers are completely missing, and many clauses cannot be applied to them. Therefore, a complete reworking of the standard could solve that inadequate status; this will be done later.

## 2 Modification to Clause 1 "Scope and object"

*In NOTE 2, **add** "and capsule and pod/pad makers" **after** "espresso coffee makers".*

## 3 Modification to Clause 2 "Normative references"

*Replace the text by the following:*

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

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

EN 60584-2, *Thermocouples – Part 2: Tolerances (IEC 60584-2)*  
<https://standards.iteh.ai/catalog/standards/sist/4a35e938-616c-4c7f-af2d-50b5706d55/sist-en-60661-2014>

EN ISO 3696:1995, *Water for analytical laboratory use – Specification and test methods (ISO 3696:1987)*

ISO 3972:1991, *Sensory analysis – Methodology – Methods of investigating sensitivity of taste*

ISO 4121:1987, *Sensory analysis – Methodology – Evaluation of food products by methods using scales*

## 4 Modifications to Clause 3 "Definitions"

*Replace definition 3.4 by the following:*

### 3.Z1

#### **pressure coffee maker**

coffee maker with water heated and forced through ground coffee and filter by steam pressure or mechanical pump

### 3.Z1.1

#### **espresso coffee maker**

coffee maker with heated water that is forced through ground coffee and filter by steam pressure, manual piston drive or mechanical pump, with a mechanical pump pressure equal to or higher than 10 bar

### 3.Z1.2

#### low pressure coffee maker

coffee maker with heated water that is forced through ground coffee and filter by steam pressure, manual piston drive or mechanical pump, with mechanical pump pressure lower than 10 bar

Note 1 to entry: Electrical "moka pot" coffee maker with water heated and forced through ground coffee and filter by steam pressure is a low pressure coffee maker.

## 5 Modification to 23.2 "Taste of the coffee"

*In the second paragraph, replace "ISO 3696" by "EN ISO 3696".*

## 6 Modification to Clause 25 "Descaling test"

*Delete the second paragraph.*

## 7 Modification to Clause 26 "Energy consumption"

*Replace the text of Clause 26 by the following:*

### 26.Z1 Special conditions and measurement accuracy

#### 26.Z1.1 Ambient temperature

Ambient temperature condition for energy consumption measurements shall be  $23\text{ °C} \pm 2\text{ °C}$ .

#### 26.Z1.2 Storage of appliances

Appliances are stored at ambient temperature for at least 6 h before measurements.

#### 26.Z1.3 Energy measurement accuracy

- a) The energy measurements shall be accurate to  $\pm 1,5\%$ .
- b) The resolution of energy measurements shall be 1 Wh or better.
- c) Standby and off mode are measured according to EN 50564:2011.

For energy measurements during active modes, a) and b) are applicable.

For appliances connected to more than one phase, the power measurement instrument shall be equipped to measure total power of all phases connected.

#### 26.Z1.4 Weighing accuracy

The uncertainty of the balance for weighing filter coffee shall be less than or equal to 1,0 g.

The uncertainty of the balance for weighing the mass of brewed coffees and steaming water for pressure coffee makers shall be less than or equal to 0,1 g.

### 26.Z1.5 Temperature measurement accuracy

The uncertainty of the temperature measurements relevant for energy measurements – ambient and water or coffee – shall be less than or equal to  $\pm 1,5$  K.

Temperature measurement shall be conducted in line with EN 60584-2.

### 26.Z2 Pressure coffee makers

#### 26.Z2.1 Categories and designations

Categories and designations of coffee makers that are to be measured as "pressure coffee makers" are fully automatics, capsule, pod or pad makers, and makers with manual piston drive. "Moka pot" espresso coffee makers are not in the scope.

#### 26.Z2.2 Coffee period

##### 26.Z2.2.1 Preparations

All features (such as auto-power-down, heating systems, grinding, brewing, rinsing, etc.) are to be set in factory default mode except the amount of coffee used per cup.

The coffee beans used shall be 100 % Arabica.

The capsules/pods/pads used are according to manufacturer's instruction and shall be specified in the measurement report.

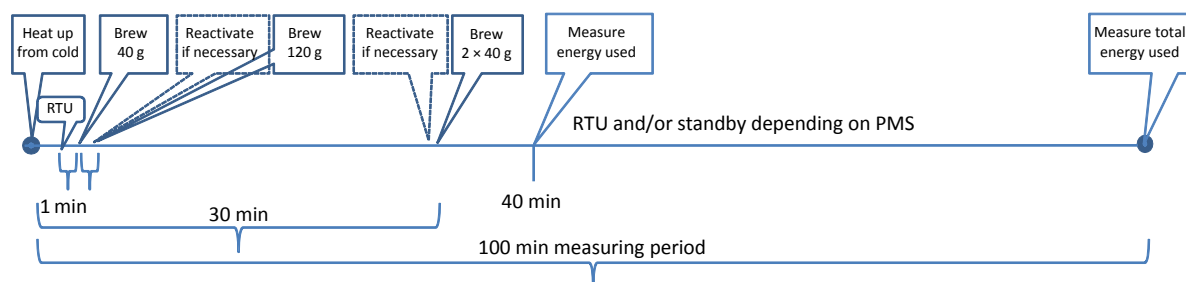
The beakers used shall be as described in Annex ZA.

Water temperature ( $T_w$ ) in the reservoir shall be  $23\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ .

Water temperature ( $T_w$ ) and ambient temperature ( $T_A$ ) are measured before start and reported.

If the amount of coffee used per cup can be adjusted, the settings shall be as close to 40 g and 120 g as possible. The chosen settings shall be reported.

##### 26.Z2.2.2 Procedure



#### Key

RTU ready to use  
PMS power management system

**Figure Z1 – Coffee period, pressure makers**

If refilling water or emptying the (used) coffee grounds is needed during the measurement, this should be done in a waiting period. The temperature of the water shall be  $23\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ .



The appliance is switched on and the energy consumption measurement starts and continues for  $100 \text{ min} \pm 2 \text{ s}$ .

The temperature of the coffee is measured within 5 s after serving and a short stirring in the middle of the plastic beaker, with a rod of negligible heat capacity.

The first brewing cycle starts  $60 \text{ s} \pm 2 \text{ s}$  after the maker is ready for brewing. This is a 40 g coffee, and temperature ( $T_{C1}$ ) and mass of coffee ( $M_{C1}$ ) are measured and to be reported.

In case the temperature does not reach  $76 \text{ }^\circ\text{C}$ , a correction of the energy is made as described in 26.Z2.6.2.

In case the actual coffee mass deviates from the nominal, a correction is made as described in 26.Z2.6.2.

The second brewing cycle is done  $60 \text{ s} \pm 2 \text{ s}$  after the maker has finished the first brewing cycle. If needed, the maker is to be re-activated. This is a 120 g coffee, and temperature ( $T_{C2}$ ) and mass of coffee ( $M_{C2}$ ) are measured and to be reported. For makers where there is no possibility to change the cup size, two cups of same size are brewed, irrespectively of size. After that, the energy measurement shall continue without any further interaction until minute 30.

$30 \text{ min} \pm 2 \text{ s}$  from start, the third brewing is made, a 2 x 40 g coffee is made. If needed, the maker is to be re-activated. The mass of coffee ( $M_{C3}$ ) is measured and to be reported. After that, the energy measurement shall continue without any further interaction.

In case the maker can only make single coffees, the double coffees are replaced by 2 singles of the same weight to be made immediately in sequence. The mass of both coffees is measured and to be reported.

$40 \text{ min} \pm 2 \text{ s}$  from start, the accumulated energy consumption is measured and to be reported ( $E_{40}$ ).

$100 \text{ min} \pm 2 \text{ s}$  from start, the accumulated energy consumption is measured and to be reported ( $E_{100}$ ).

SIST EN 60661:2014

**26.Z2.3 Steam function**

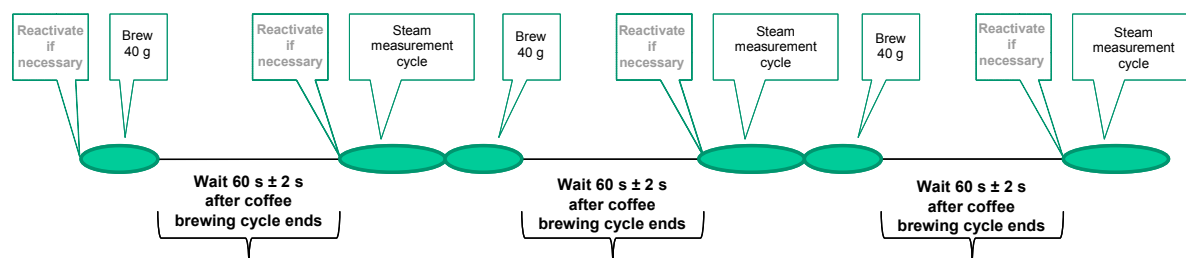
### 26.Z2.3.1 Preparations

The beaker used shall be as described in Annex ZA.

The water temperature at the start in the beaker ( $T_S$ ) shall be  $15 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ .

$100 \text{ g} \pm 1 \text{ g}$  water is heated up to  $55 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$  in the beaker.

### 26.Z2.3.2 Procedure



**Figure Z2 — Steaming, pressure makers**

The steam function is started  $60 \text{ s} \pm 2 \text{ s}$  after a coffee brewing cycle has ended and the maker is ready to be used. The energy is measured from the moment the steam function is activated by pre-selection of steaming, opening the steam valve or pushing the steam button, until the moment the required water temperature in the beaker has been obtained.

This cycle is done three times and the energy is measured ( $E_{S1}, E_{S2}, E_{S3}$ ) for each cycle.

The water temperature at the start in the beaker ( $T_S$ ) shall be reported for each cycle.

The temperature in the beaker shall be monitored continuously until the required temperature is reached. When the required temperature is reached, steaming is stopped and immediately the final temperature ( $T_F$ ) is measured in the middle of the beaker, after a short stirring, and to be reported.

Each of the 3 steam cycles shall be started  $60 \text{ s} \pm 2 \text{ s}$  after a coffee brewing cycle.

The initial water temperature in the beaker is measured and to be reported ( $T_{S1}, T_{S2}, T_{S3}$ ).

The final water temperature in the beaker is measured and to be reported ( $T_{F1}, T_{F2}, T_{F3}$ ).

Where it is not possible to start coffee brewing immediately after steaming, the manual's instructions shall be followed.

In case of a milk-frothing device based on a venturi principle, the same procedure as above is followed. The air inlet at the venturi tube shall be blocked, if possible.

In case no steam tube exists, the following procedure is used. The milk jug (container) is filled with water of  $15 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ . The process is started and continued until a mass of  $110 \text{ g} \pm 1 \text{ g}$  is in the beaker.

NOTE The 10 g extra compensate for the condensed steam amount.

#### 26.Z2.4 Standby mode

The power or energy measurement is started immediately after the maker has switched into its standby mode and according to EN 50564:2011. The value of Power in standby mode ( $P_{\text{standby}}$ ) over 1 h is to be recorded as Energy ( $E_{\text{standby}}$ ).

If a maker does not have a power management system including automatically switching to standby mode or off mode, the value of  $E_{100} - E_{40}$  shall be used as standby mode energy consumption for 1 h.

If the maker has a power management system that switches the maker to off mode, the off mode power consumption is taken as standby power.

#### 26.Z2.5 Off mode

The power or energy consumption in the off mode is measured according to EN 50564:2011. The value of Power in off position ( $P_{\text{off}}$ ) over 1 h is to be recorded as Energy in off position ( $E_{\text{off}}$ ).

If the maker does not have any off mode, the standby mode value is used for this value.

### 26.Z2.6 Calculation of relative energy consumption

#### 26.Z2.6.1 Introduction

The energy rating is calculated as a relation between the weighted sum of the measured values for functions as given in Table Z1 and the weighted sum of the benchmark energy values based. Weighting factors are set to represent the energy consumption during 24 h.

**26.Z2.6.2 Benchmark for coffee period**

Average weight (g) of brewed coffee:

$$M_{coffee} = \frac{\sum_{n=1}^3 M_{C,n}}{3} \quad (1)$$

Actual temperature (°C) of brewed coffee:

$$T_{act} = \frac{T_{C1} + T_{C2}}{2} \quad (2)$$

If  $T_{act}$  is higher than 76 °C, ( $T_{act} - T_w$ ) shall be set to 53 °C. When  $T_{act}$  is below 76 °C, the measured value  $T_{C1} + T_{C2}$  shall be used.

Corrected benchmark energy (Wh) for coffee period:

$$B_{coffee} = B_{brew} \cdot \frac{M_{coffee}}{80} \cdot \frac{T_{act} - T_w}{76 - 23} + B_{hu\&ready} \quad (3)$$

$B_{brew}$  is to be used as energy benchmark for the brewings,  $B_{hu\&ready}$  is to be used as energy benchmark for heating up and ready mode.

Benchmark values  $B_{brew} = 27,9$  Wh,  $B_{hu\&ready} = 43,5$  Wh.

**26.Z2.6.3 Benchmark for steaming**

Average measured energy (Wh) for steaming:

$$E_{steam} = \frac{\sum_{n=1}^3 E_{S,n}}{3} \quad (4)$$

Average temperature rise (°C):

$$\Delta T_{steam} = \frac{\sum_{n=1}^3 T_{F,n} - \sum_{n=1}^3 T_{S,n}}{3} \quad (5)$$

Corrected benchmark energy (Wh) for steaming:

$$B_{steam} = 15 \cdot \frac{\Delta T_{steam}}{40} \quad (6)$$

NOTE The value of 15 Wh for steaming of 100 g water over  $\Delta T$  40 K has been found empirically.

**26.Z2.6.4 Relative energy consumption value**

$W_i$  = Weighting factor based on use frequency for function i

$EB_i$  = Benchmark energy value for function  $i$

$P_i$  = Function  $i$  available (yes=1, no=0)

NOTE 1  $P_i$  coefficient is used with steaming, rinsing and grinding. For other functions,  $P_i$  coefficient is set to 1.

$E_i$  = Measured energy for function  $i$

NOTE 2 The theoretical energy content to heat up 100 g water from 15 °C to 55 °C is: 4,651 Wh + heating up thermoblock (e.g. 6,86 Wh + Losses (e.g. 30 W for 5' = 2,5 Wh)) = 14 Wh. During tests, 15 Wh has been found empirically. Therefore, 15 Wh is used as benchmark for steaming.

**Table Z1 — Relative energy consumption values for functions of pressure coffee makers**

Index	Function	Subclause	$W_i$	$EB_i$ Wh	$E_i$
1	Coffee period	26.Z2.2	3	$B_{\text{coffee}}$	$E_{100}$
2	Steam function	26.Z2.3	1	$B_{\text{steam}}$	$E_{\text{steam}}$
3	Standby mode	26.Z2.4	11	1	$E_{\text{standby}}$
4	Off mode	26.Z2.5	8	0,5	$E_{\text{off}}$
5	Rinsing	-	1	3	0 <sup>a</sup>
6	Grinding	-	1	2	0 <sup>b</sup>

a Measured as a part of the heat up function.  
b Measured as a part of the coffee period.

SIST EN 60661:2014

The energy consumption value is given by:

$$E_{\text{rating}} = \frac{\sum_{i=1}^6 W_i \cdot E_i}{\sum_{i=1}^6 P_i \cdot W_i \cdot B_i} \cdot 100 (\%)$$

(7)

## 26.Z3 Filter coffee makers

### 26.Z3.1 Preparation

All features (such as auto-power-down, heating systems, etc.) are to be set in factory default mode.

Accessories, e.g. (thermos) jugs are to be used according to user's manual.

### 26.Z3.2 Coffee period

#### 26.Z3.2.1 Preparations

Measurements are performed without coffee powder and paper filter. In case of filter coffee makers with integrated coffee grinder, the grinder function shall not be part of the energy measurement procedure.

If the maker provides a plastic or metal filter, this filter shall not be used unless necessary for the function of the appliance.