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BS EN 60350-1:2013+A11:2014



BSI Standards Publication

Household electric cooking appliances

Part 1: Ranges, ovens, steam ovens and grills — Methods for measuring performance

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This British Standard is the UK implementation of EN 60350-1:2013+A11:2014. It is derived from IEC 60350-1:2011, incorporating corrigenda February 2012 and August 2013. Together with BS EN 60350-2:2013 it supersedes BS EN 50304:2009+A1:2010 (dual numbered as BS EN 60350:2009+A11:2010) which will be withdrawn on 3 June 2016.

IEC corrigendum August 2013 introduces an electronic file containing calculation sheets in Annex E.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags **C** **C**.

Where a common modification has been introduced by CENELEC amendment, the tags carry the number of the amendment. For example, the common modifications introduced by CENELEC amendment A11 are indicated by **C11** **C11**.

BSI, as a member of CENELEC, is obliged to publish EN 60350-1:2013 as a British Standard. However, attention is drawn to the fact that the UK committee voted against its approval as a European standard. The main technical reasons behind this are summarized below.

Both clauses 7.Z1 and ZB.4 should aim to establish the uncertainties of the measurement method but the current text is related to the tolerances for market surveillance procedures used in Eco-design and Energy labelling. It should be noted that the test results in a product's Technical Documentation have to support the values declared for the Directives. The text within the Directives takes precedence if there is a conflict with what is written in the standard.

Annex ZA should have made references to the Essential Requirements of both the Eco-design of Energy-Related Products and the Energy Labelling of Products Directives.

The UK participation in its preparation was entrusted to Technical Committee CPL/59, Performance of household electrical appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Amendments/corrigenda issued since publication

Date	Text affected
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**Household electric cooking appliances -
Part 1: Ranges, ovens, steam ovens and grills -
Methods for measuring performance**

Appareils de cuisson électrodomestiques -
Partie 1: Cuisinières, fours, fours à vapeur
et grills -
Méthodes de mesure de l'aptitude à la
fonction

Elektrische Kochgeräte für den
Hausgebrauch -
Teil 1: Herde, Backöfen, Dampfgarer und
Grillgeräte -
Verfahren zur Messung der
Gebrauchseigenschaften

This European Standard was approved by CENELEC on 2013-06-03. 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.

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

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Foreword

This document (EN 60350-1:2013) consists of the text of IEC 60350-1:2011 + corrigendum Feb. 2012 prepared by IEC/SC 59K "Ovens and microwave ovens, cooking ranges and similar appliances", of IEC/TC 59 "Performance of household and similar electrical appliances", together with the common modifications prepared by 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) 2014-06-03
at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting (dow) 2016-06-03
with this document have to be withdrawn

Together with EN 60350-2:2013, this document supersedes EN 50304:2009/EN 60350:2009 + A1:2010/A11:2010.

This publication contains an attached file in the form of an Excel 97 file. This file is intended to be used as a complement and does not form an integral part of the publication.

EN 60350-1:2013 includes the following significant technical changes with respect to EN 50304:2009/EN 60350:2009:

- the scope is revised (Clause 1). The ovens covered by this standard may be with or without microwave function. Steam ovens are included;
- new definitions for "Set to off mode" and "Set to standby mode" are included in Clause 3;
- the usable volume is reworded in calculated volume (6.2);
- performance measurements for steam ovens are described in 7.3 and Clause 8;
- an option for assessing the heat distribution with a digital measurement system is included in 7.5.2.4;
- Clause 12 "Standby power" is renamed to "Consumption measurement of low power modes" and the content is adapted to EN 50564;
- a measurement method for measuring the consumption of the cooling down period is added in the informative Annex ZB;
- a measurement method to check applied Microwave Energy during the measurement according to 7.4 is added in the informative Annex ZC.

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60350-1:2011 are prefixed "Z".

Words in **bold** in the text are defined in Clause 3.

According to the decision D137/061 for CLC/TC 59X, this European Standard has been drawn up as a document which follows, as far as suitable, the structure of IEC 60350-1:2011.

It also describes the evaluation of data declared by the manufacturer and control procedures for checking these values.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

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indication by labelling and standard product information of the consumption of energy and other resources by energy-related products. All paragraphs which are relevant for the measuring of energy labelling are listed in Annex ZA.

Foreword to amendment A11

This document (EN 60350-1:2013/A11:2014) has been prepared by 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 at national level by publication of an identical national standard or by endorsement (dop) 2015-09-29
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2017-09-29

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.

The new amendment covers following issues:

- reference to EN ISO 80000-1:2012 for rounding;
- amending 6.8 mass of the appliances to ensure high reproducibility;
- verification procedure for ensuring that the temperature inside the oven cavity reaches the temperature setting of the thermostat and/or the oven control display within the duration of the test cycle for measuring the energy consumption (7.4.3.2) and implementing this issue to Annex ZE;
- implementation of Annex ZZ which shows the coverage of Commission Regulation and Commission Delegated Regulation and revision of Annex ZA.

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).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

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Annex ZA (normative)

Overview – Clauses required for the EU Directive on Energy Labelling

For the procedure required for the EU Directive on Energy Labelling, the following clauses are applicable:

- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 5 General conditions for the measurements
- 6 Dimensions and mass
 - 6.2 Usable Internal dimensions and calculated volume of ovens
 - 6.4 Dimensions of shelves
 - 6.5 Dimensions of grill grids
- 7 Ovens and combi steam ovens
 - 7.2 Preheating the empty oven
 - 7.4 Energy consumption and time for heating a load
 - 7.21 Measurement uncertainty of results
- 12 Consumption measurement of low power modes

Figure 1 Position of the thermocouple for measuring ambient temperature

Figure 4 Usable internal dimensions and calculated volume of ovens

Figure 6 Example of a method of fixing a thermocouple for the test of 7.4

Annex C Addresses of suppliers
C.7 Brick for testing energy consumption of ovens

Annex D Description of the test brick

Annex E Calculation sheet: Energy consumption of electric ovens

Annex ZA Overview – Clauses required for the EU Directive on Energy Labelling

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(informative)

Measurement of the energy consumption of the cooling down period

ZB.1 General

The purpose of this test is to measure the energy consumption of the **cooling down period**.

For cooking ranges, ovens and steam ovens the energy consumption of the **cooling down period** is measured.

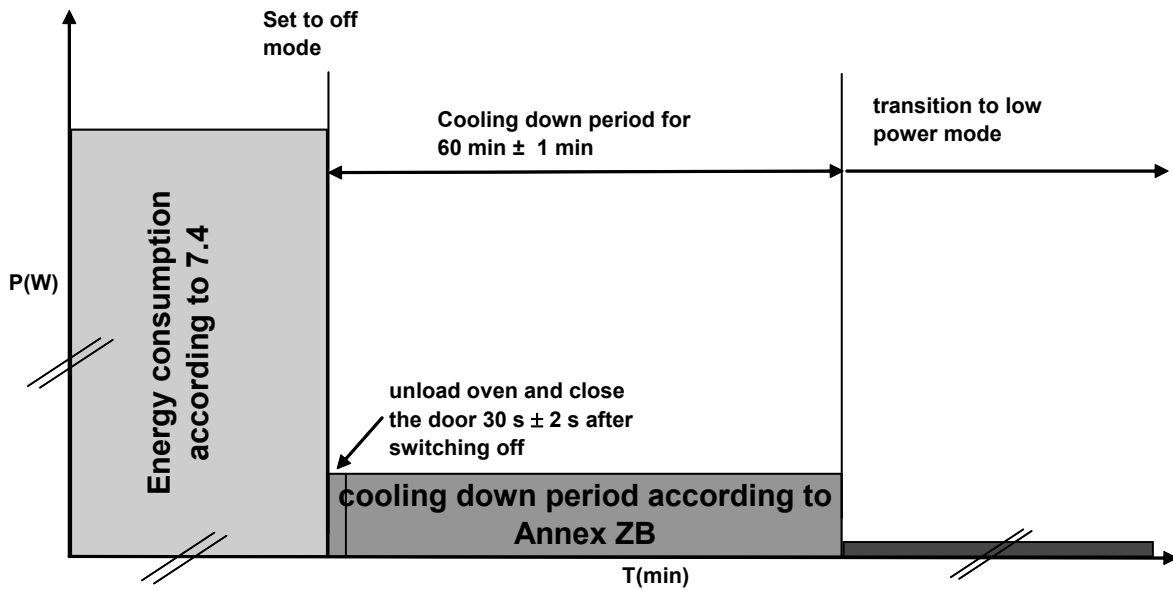


Figure ZB.1 – Phases of energy consumption measurement – Example

ZB.2 Preliminary measurements

For measuring the energy consumption of the cooling down period a pre-test to fix the relevant temperature setting is carried out.

A thermocouple is placed in the empty oven as described in Clause 7.

The temperature control is set to positions where the mean oven temperature rises ΔT_2^i as defined in Table 1 can be expected. The oven is run for some time without changing the setting until steady state conditions reached. The oven temperature is determined as the arithmetic mean between the maximum and minimum temperatures at steady state conditions.

NOTE Steady conditions are considered to be attained after five cycles of the thermostat or 1 h, whichever is shorter.

The temperature control setting is adapted until the arithmetic mean between the maximum and minimum temperature is $\Delta T_2^i \pm 5$ K. This temperature control setting is noted for measuring the energy consumption of the cooling down period.

The oven is cooled down to ambient temperature.

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The procedure to prepare the brick stated in 7.4.2.2 and 7.4.2.3 is followed. The brick is positioned in the oven according to 7.4.3.1. The oven is switched on within 3 min from the removal of the brick from the refrigerator. The temperature control is set to the position determined in ZB.2. The oven is operated for the time $t_{\Delta T_0}^{i\dots}$ determined in 7.4.4.2.

The measurement shall be started by setting the appliance to **off mode**. The brick is removed and the door shall be closed after (30 ± 2) s. The measurement of the low power energy consumption is started immediately when the appliance is **set to off mode**.

If the appliance doesn't offer an off mode it is **set to standby mode**.

The measurement is stopped after $60 \text{ min} \pm 1 \text{ min}$ independent if the ventilation stops automatically.

The energy consumption for the cooling down period W_v is noted in Wh for each heating mode according to Table 1.

Ensure that the following conditions remain relevant for the duration of the measurement:

- connected to mains power for the duration of the test;
- no network is connected to the product.

ZB.4 Measurement uncertainty – Energy consumption for the cooling down period

The energy consumption for the cooling down period determined according to ZB.3 shall not be greater than the value declared by the manufacturer plus 15 %.

If the result of the test carried out on the first appliance is greater than the declared value plus 15 %, the test shall be carried out on a further three appliances, which shall be randomly selected from the market.

The arithmetical mean of the values of these three appliances shall not be greater than the declared value plus 10 %.

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(informative)

Check of applied microwave energy during the measurement according to 7.4

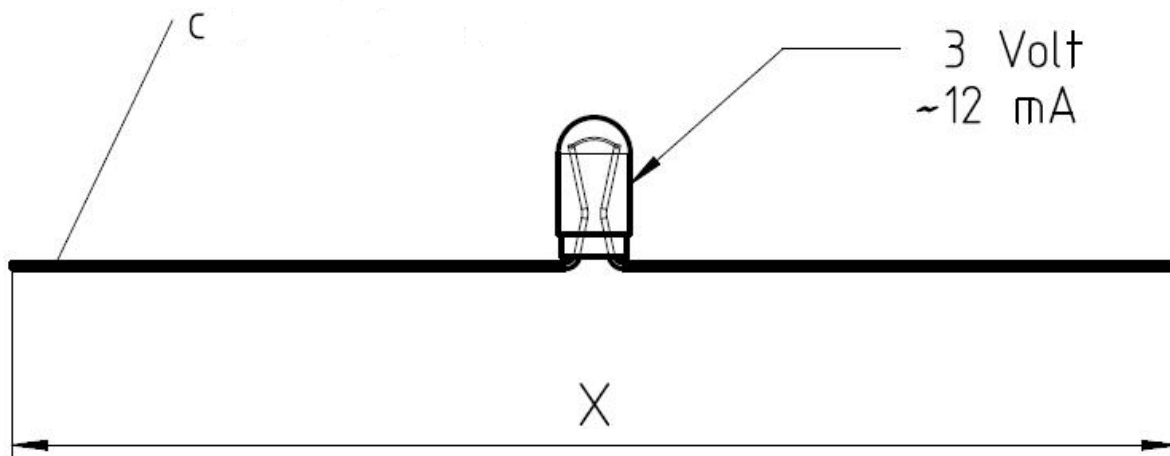
ZC.1 General

Heating up the brick according to 7.4 shall only be done with thermal heating. It is not allowed to switch on a magnetron even not for a short period.

The sophisticated method to check a possible applied microwave energy during the energy consumption measurement according to 7.1 is to proof if the magnetron is switched on and off. Depending on the design of the appliances it is not always possible to determine clearly if microwave energy is switched on during the long lasting heating up process. Therefore following method can be used in a pre-test.

ZC.2 Procedure

A filament lamp with a rated current of 12 mA and rated voltage less than 6 V with bended connecting wires is used. The length of the wires are approximately half of the wave length of the microwave so the current distribution is maximum in the middle where the filament of the lamp is (see Figure ZC.1).



Key

- c connecting wire
- x in the range of 50 mm to 60 mm

Figure ZC.1 — Filament lamp

The brick is prepared as described in 7.4.2.3 and placed in the oven as described in 7.4.3.1 The filament lamp is placed on the upper surface of the wet brick. The oven is switched on and operated according to 7.4.3.1 for at least this time which is necessary to have a temperature rise in the brick of 55 K.

Then the oven is switched off and the filament lamp is tested. If microwave energy was applied the electric field during microwave operation will induce currents much more than 12 mA so the filament will be damaged. The lamp can be tested with a resistance-test-equipment or with a small tester for LED lamps. The lamp is put into a socket and the filament will light up if it is not damaged. Otherwise microwave energy was applied.

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(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60584-2 + A1	1982 1989	Thermocouples Part 2: Tolerances	EN 60584-2	1993
IEC 62301 (mod)	2011	Electrical and electronic household and office equipment – Measurement of low power consumption	EN 50564	2011
ISO 7724	(all parts)	Paints and varnishes - Colorimetry	-	-
ISO 11664-2	-	Colorimetry Part 2: CIE standard illuminants	EN ISO 11664-2	-
CIE 15.2	1986	Colorimetry	-	-

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(informative)

Marking the temperature setting for checking the oven temperature

For marking the temperature setting on the panel, a polar coordinate paper can be useful. Polar coordinate paper has concentric circles divided into small arcs to allow an exact marking around a knob.

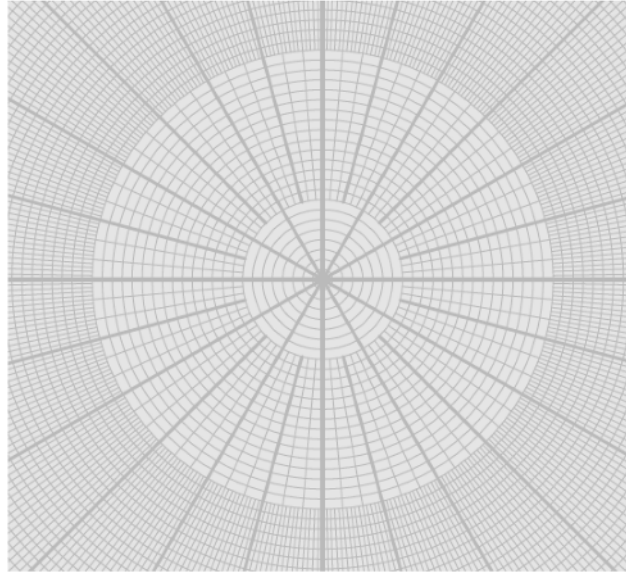


Figure ZE.1 – Polar coordinate paper – Example

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 **Annex ZZ**
(informative)

**Coverage of Requirements of Commission Regulation (EU) No 66/2014 and
Commission Delegated Regulation (EU) No 65/2014 and
Commission Regulation (EC) No 1275/2008**

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers only the following requirements out of those given in *Commission Regulation (EU) No 66/2014 of 14 January 2014* implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household **ovens** and *Commission Delegated Regulation (EU) No 65/2014 of 1 October 2014* supplementing Directive 2010/30/EU with regard to energy labeling of household **ovens**:

- ensuring that the prospective harmonized standard(s) provides, where appropriate, revised and/or new definitions for at least the appliances and parameters included in the Commission Regulation (EU) No 66/2014 and in the Commission Delegated Regulation (EU) No 65/2014., including additional requirements for the measurement of low power modes according (EC) No 1275/2008 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off-mode electric power consumption of electrical and electronic household and office equipment;
- ensuring that the prospective harmonized standard(s) provides procedures and methods to measure at least the energy consumption for household electric **ovens** as included in the Commission Regulation (EU) No 66/2014 and in the Commission Delegated Regulation (EU) No 66/2014;
- ensuring that the prospective harmonized standard takes into account a load which is representing the food in the test conditions:
 - a test procedure for measuring the energy consumption of an adequate application is confirmed;
 - a test procedure for checking the oven temperature within the duration of measuring the energy consumption to prevent circumvention is introduced;
 - control procedures for checking measured values in comparison to values declared by the manufacturer are updated;
- ensuring that the prospective harmonized standard(s) identifies and controls the sources of variability, in particular for market surveillance purposes; defining a template for a data calculation sheet.

Compliance with this standard provides means of conformity with the specified requirements of the Commission Regulations concerned.

WARNING: Other requirements or other EU Directives or Commission Regulations may be applicable to the products falling within the scope of this standard.

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Commission Regulation (EU) No 66/2014 and Commission Delegated Regulation (EU) No 65/2014 and Commission Regulation (EC) No 1275/2008:

1 Scope

2 Normative references

3 Terms and definitions

5 General conditions for measurements

6.2 Usable internal dimensions and calculated volume of ovens

6.8 Mass of the appliance

7.1 General

7.4 Energy consumption and time for heating a load

7.Z1 Measurement uncertainty of results

12 Consumption measurement of low power modes

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Annex ZE Marking the temperature setting for checking the oven temperature

Annex ZZ Coverage of Requirements of Commission Regulation (EU) No 66/2014 and Commission Delegated Regulation (EU) No 65/2014 and Commission Regulation (EC) No 1275/2008

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