



BSI Standards Publication

Household electric cooking appliances

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

National foreword

This British Standard is the UK implementation of EN 60350-1:2016+A1:2021. It is derived from IEC 60350-1:2016, incorporating amendment 1:2021. It supersedes BS EN 60350-1:2016, which will be withdrawn on 26 January 2022.

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]**.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by **[A1]** **[A1]**.

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 committee manager.

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Annex ZA/ZZ in the European text, and references to EU legislation, are still valid for this market.

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Amendments/corrigenda issued since publication

Date	Text affected
31 January 2018	Missing Excel spreadsheet added
31 July 2021	Implementation of IEC amendment 1:2021 with CENELEC endorsement A1:2021

English Version

**Household electric cooking appliances - Part 1: Ranges, ovens,
steam ovens and grills - Methods for measuring Performance
(IEC 60350-1:2016 , modified)**

Appareils de cuisson électrodomestiques - Partie 1:
Cuisinières, fours, fours à vapeur et grils - Méthodes de
mesure de l'aptitude à la fonction
(IEC 60350-1:2016 , modifiée)

Elektrische Kochgeräte für den Hausgebrauch - Teil 1:
Herde, Backöfen, Dampfgarer und Grills - Verfahren zur
Messung der Gebrauchseigenschaften
(IEC 60350-1:2016 , modifiziert)

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

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European foreword

The text of document 59K/263/CDV, future edition 2 of IEC 60350-1, prepared by SC 59K "Performance of household and similar electrical cooking appliances" of IEC/TC 59 "Performance of household and similar electrical appliances" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60350-1:2016.

A draft amendment, which covers common modifications to IEC 60350-1 (59K/263/CDV), was prepared by CLC/TC 59X "Performance of household and similar electrical appliances" and approved by CENELEC.

The following dates are fixed:

- latest date by which the document has to be (dop) 2017-05-04
implemented at national level by
publication of an identical
national standard or by endorsement
- latest date by which the national (dow) 2019-11-04
standards conflicting with the document
have to be withdrawn

This document supersedes EN 60350-1:2013.

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Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60350-1:2016 are prefixed "Z".

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 Regulations.

For the relationship with EU Regulations see informative Annex ZZA, Annex ZZB and Annex ZZC which are integral parts of this document.

Endorsement notice

The text of the International Standard IEC 60350-1:2016 was approved by CENELEC as a European Standard with agreed common modifications.

Foreword to amendment A1

The text of document 59K/328/FDIS, future IEC 60350-1/A1, prepared by SC 59K "Ovens and microwave ovens, cooking ranges and similar appliances" of IEC/TC 59 "Performance of household and similar electrical appliances" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60350-1:2016/A1:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-03-21
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-06-21

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Endorsement notice

The text of the International Standard IEC 60350-1:2016/A1:2021 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(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 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60584-2	1982	Thermocouples - Part 2: Tolerances	EN 60584-2	1993
IEC 62301	-	Household electrical appliances - Measurement of standby power	EN 50564	-
ISO 80000-1	2009	Quantities and units - Part 1: General	EN ISO 80000-1	2013
CIE 15.2		Colorimetry	-	-

Annex ZZA (informative)

Relationship between this European Standard and the energy labelling requirements of Commission Delegated Regulation (EU) No 65/2014 aimed to be covered

This European standard has been prepared under a Commission's standardization request M/495 Standardization mandate to CEN, CENELEC and ETSI under Directive 2009/125/EC relating to harmonized standards in the field of Ecodesign to provide one voluntary means of conforming to the energy labelling requirements of Commission Delegated Regulation (EU) No 65/2014 of 1 October 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of domestic ovens and range hoods [OJ L 29/1, 31.01.2014].

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in Table ZZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding energy labelling requirements of that Regulation and associated EFTA Regulations.

Table ZZA.1 — Correspondence between this European Standard and Commission Delegated Regulation (EU) No 65/2014 of 1 October 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of domestic ovens and range hoods [OJ L 29/1, 31.01.2014] and Commission's standardisation request M/495 Standardization mandate to CEN, CENELEC and ETSI under Directive 2009/125/EC relating to harmonized standards in the field of Ecodesign

Energy labelling requirements of Regulation No 65/2014 [OJ L 29/1, 31.01.2014]	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
General description of the appliance model; number of cavities; heat source(s) per cavity; the heating function(s) (conventional and/or the forced air convection) per cavity	1 Scope 2 Normative references 3 Terms and definitions 6.8 Mass of the appliances	
Determining the volume of the cavity of the domestic oven in litres	6.2 Usable internal dimensions and calculated volume of ovens	
Measuring the energy consumption of a cavity of a domestic oven for one standardised cycle by heating a standardised load soaked with water (conventional and if available the forced air convection)	5 General conditions for the measurement 7.1 General 7.4 Energy consumption and time for heating a load C.7 Brick for testing energy consumption of ovens Annex D Description of the test brick	
Verifying 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	7.4.3.2 Checking the oven temperature Annex I Marking the temperature setting for checking the oven temperature	
copy of the calculation and the results of the calculations	Annex E Data and calculation sheet: Energy consumption for heating a load	

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Annex ZZB (informative)

Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 66/2014 aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/495 Standardization mandate to CEN, CENELEC and ETSI under Directive 2009/125/EC relating to harmonized standards in the field of Ecodesign to provide one voluntary means of conforming to the ecodesign requirements of 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 domestic ovens, hobs and range hoods [OJ L 29/33, 31.01.2014].

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Table ZZB.1 — Correspondence between this European Standard and 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 domestic ovens, hobs and range hoods [OJ L 29/33, 31.01.2014] and Commission's standardization request M/495 Standardization mandate to CEN, CENELEC and ETSI under Directive 2009/125/EC relating to harmonized standards in the field of Ecodesign

Ecodesign requirements of Regulation No 66/2014 [OJ L 29/33, 31.01.2014]	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
General description of the appliance model; number of cavities; heat source(s) per cavity; the heating function(s) (conventional and/or the forced air convection) per cavity.	1 Scope 2 Normative references 3 Terms and definitions 6.8 Mass of the appliances	
Determining the volume of the cavity of the domestic oven in litres.	6.2 Usable internal dimensions and calculated volume of ovens	
Measuring the energy consumption of a cavity of a domestic oven for one standardized cycle by heating a standardized load soaked with water (conventional and if available the forced air convection).	5 General conditions for the measurement 7.1 General 7.4 Energy consumption and time for heating a load C.7 Brick for testing energy consumption of ovens Annex D Description of the test brick	
Verifying 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.	7.4.3.2 Checking the oven temperature Annex I Marking the temperature setting for checking the oven temperature	

copy of the calculation and the results of the calculations.	Annex E Data and calculation sheet: Energy consumption for heating a load	
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Annex ZZC (informative)

Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EC) No 1275/2008 aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/439 Mandate to CEN, CENELEC and ETSI for standardization in the field of standby and off modes power consumption measurement for energy using products (EuPs) to provide one voluntary means of conforming to the ecodesign requirements of Commission Regulation (EC) No 1275/2008 of 17 December 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 [OJ L 339, 18.12.2008].

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in Table ZZC.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding ecodesign requirements of that Regulation and associated EFTA regulations.

Table ZZC.1 – Correspondence between this European Standard and Commission Regulation (EC) No 1275/2008 of 17 December 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 [OJ L 339, 18.12.2008] and Commission's standardization request M/439 Mandate to CEN, CENELEC and ETSI for standardization in the field of standby and off modes power consumption measurement for energy using products (EuPs)

Ecodesign requirements of Regulation (EC) No 1275/2008 [OJ L 339, 18.12.2008]	Clause(s) and subclause(s) of this EN	Remarks / Notes
Power consumption requirements for standby- and off-mode	12 Consumption measurement of low power modes (additional requirements for the measurement of low power modes)	

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC 60350-1 Edition 2.0 2016-04

HOUSEHOLD ELECTRIC COOKING APPLIANCES –

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

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by subcommittee 59K: Performance of household and similar electrical cooking appliances, of IEC technical committee 59: Performance of household and similar electrical appliances.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
59K/322/DISH	59K/325/RVDISH

Full information on the voting for the approval of this interpretation sheet can be found in the report on voting indicated in the above table.

SC 59K interpretation sheet on: Volume measurement in IEC 60350-1:2016

Rationale

When measuring the oven volume in accordance with IEC 60350-1:2016, 6.2, the wording in the standard leaves room for interpretation as to how to proceed with side grids in the oven. In many regions, the volume is used to calculate an energy efficiency index, which always raises the question as to what extent the measurement with and without side grids leads to different statements on energy efficiency.

This document clarifies how to interpret 6.2 of IEC 60350-1:2016 in order to achieve a clearer approach.

Question

According to IEC 60350-1:2016, 6.2, removable items, e.g. the side grids, shall be removed to measure the volume if this is indicated in the user manual. The question that arises is to ascertain when this condition is met, and when the measurement is performed without side grids.

Answer

The usable width of the oven is measured in accordance with 6.2.3 from the left side wall of the cavity to the right side wall of the cavity. In accordance with 6.2.1, parts, such as side grids, shall be removed before the measurement if they are removable and if they are not necessary for any intended operation, in accordance with the user manual.

As a result, side grids shall be removed if:

- 1) the user manual describes the removal of side grids (the extent of the description and the assignment to a chapter is not defined);
- 2) the user manual describes any application for which the removable parts are not required (= intended operation). This is the case when an application on the bottom of the cavity without the use of side grids is given as an example. The number of applications as well as the type of application (heating type, temperature, minor relevance, preheated operation) are not specified in 6.2.1 and are, therefore, irrelevant.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD ELECTRIC COOKING APPLIANCES –

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

FOREWORD

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International Standard IEC 60350-1 has been prepared by subcommittee 59K: Performance of household and similar electrical cooking appliances, of IEC technical committee 59: Performance of household and similar electrical appliances.

This second edition cancels and replaces the first edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- new definitions for "**set to off mode**" and "**set to standby mode**" are included in Clause 3;
- reference to ISO 80000 regarding rounding;
- more exact determination of the mass of the appliances (6.2);
- update of the existing 7.3 in order to improve the clarity of procedure;

- additional temperature requirement in 7.4.3 to ensure an adequate temperature setting during the energy measurement process;
- editorial changes in 7.6.1.3, 7.6.2.1, 7.6.2.2 and 7.6.2.3;
- revision of Clause 8 in order to increase the repeatability for the measurements for steam ovens;
- Clause 12 "Standby power" is renamed to "Consumption measurement of low power modes" and the content is adapted for IEC 62301:2011;
- replacing the supplier for the colouring measurement device in Clause C.6, because the previous device is no longer available;
- adaptation of Annex A to the new supplier of colouring measurement devices;
- adaptation of Annex E;
- measurement method for measuring the consumption of the **cooling down period** is added in the informative, new Annex G;
- measurement method to check applied microwave energy during the measurement according to 7.4 is added in the informative Annex H;
- new Annex I for marking the temperature setting for checking the oven temperature.

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.

The text of this standard is based on the following documents:

FDIS	Report on voting
59K/273/FDIS	59K/277/RVD

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

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

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

A list of all parts in the IEC 60350 series, published under the general title *Household electric cooking appliances*, can be found on the IEC website.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

 The contents of the Interpretation Sheet 1 of March 2021 have been included in this copy. 

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

HOUSEHOLD ELECTRIC COOKING APPLIANCES –

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

1 Scope

This part of IEC 60350 specifies methods for measuring the performance of electric **cooking ranges, ovens, steam ovens, and grills** for household use.

A1 NOTE 3 This document is also applicable to portable appliances with similar functionalities that were previously covered by the withdrawn IEC 61817. **A1**

The **ovens** covered by this standard may be with or without microwave function.

Manufacturers should define the primary cooking function of the appliance – microwave function or thermal heat. The primary cooking function should be measured with an existing method according to energy consumption. If the primary cooking function is declared in the instruction manual as a microwave function, IEC 60705 is applied for energy consumption measurement. If the primary cooking function is declared as a thermal heat, then IEC 60350-1 is applied for energy consumption measurement.

If the primary function is not declared by the manufacturer, the performance of the microwave function and thermal heat should be measured as far as it is possible.

NOTE 1 For measurement of energy consumption and time for heating a load (see 7.4), this standard is furthermore not applicable to:

- microwave combination function;
- ovens with reciprocating trays or turntable;
- small cavity ovens;
- ovens without adjustable temperature control;
- heating functions other than defined in 3.12 to 3.14;
- appliances with only solo **steam function** (3.15).

NOTE 2 This standard does not apply to

- microwave ovens (IEC 60705),

A1 Text deleted **A1**

This standard defines the main performance characteristics of these appliances which are of interest to the user and specifies methods for measuring these characteristics.

This standard does not specify a classification or ranking for performance.

NOTE 3 Some of the tests which are specified in this standard are not considered to be reproducible since the results may vary between laboratories. They are therefore intended for comparative testing purposes only.

NOTE 4 This standard does not deal with safety requirements (IEC 60335-2-6 and IEC 60335-2-9).

NOTE 5 Appliances covered by this standard may be built-in or for placing on a working surface or the floor.

NOTE 6 There is no measurement method for the energy consumption for grilling and **steam functions** available.

2 Normative references

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.

IEC 60584-2, *Thermocouples – Part 2: Tolerances*

IEC 62301, *Household electrical appliances – Measurement of standby power*

ISO 80000-1:2009, *Quantities and units – Part 1: General*

CIE 15, *Colorimetry*

3 Terms and definitions

For the purposes of this document the following terms and definitions apply.

3.1

cooking range

appliance having a **hob** and at least one **oven** and which may incorporate a **grill**

3.2

hob

appliance or part of an appliance which incorporates one or more **cooking zones** and/or **cooking areas** including a **control** unit

Note 1 to entry: A **hob** is also known as a cooktop.

Note 2 to entry: The **control** unit can be included in the **hob** itself or integrated in a **cooking range**.

3.3

oven

appliance or compartment of a **cooking range** in which food is cooked by radiation, by natural convection, by forced-air circulation or by a combination of these heating methods

3.4

pyrolytic self-cleaning oven

oven in which cooking deposits are removed by heating the **oven** to a sufficiently high temperature

3.5

steam oven

appliance or compartment of a **cooking range** in which food is cooked mainly by steam condensation at ambient pressure

Note 1 to entry: Appliances are fitted with their own steam generator.

Note 2 to entry: Steam does not mean the evaporated water from the food.

3.6

combi steam oven

appliance or compartment of a **cooking range** in which food is cooked by a combination of **oven** (3.3) and **steam oven** (3.5)

Note 1 to entry: Appliances with only a steam assist function also exist. For these **ovens** the **steam function** can only be tested if this function is described in the manual instruction or if the appliance provides a setting for **steam function**.

Note 2 to entry: Steam does not mean the evaporated water from the food.

3.7

grill

appliance or part of an appliance in which food is cooked by radiant heating

3.8

oven with catalytic cleaning

oven in which cooking deposits are removed by breaking them down on a special coating

3.9

warming compartment

separate compartment in which dishes are placed in order to preheat them prior to serving, or in which food is maintained at serving temperature

3.10

small cavity oven

oven with the following dimensions:

- both usable width and usable depth < 250 mm, or
- usable height < 120 mm

Note 1 to entry: The defined maximum size of small cavity **ovens** in this standard is due to the size of the test load used in 7.4.

3.11

multiple cavity appliance

appliance that has more than one separate cavity in which food is cooked and which can be controlled independently, but cannot be installed separately

3.12

conventional heating function

heat transmission to the food by radiation and natural convection only

Note 1 to entry: This does not include **conventional heating functions** which operate a top heating element only (i.e. **grill** element).

3.13

forced air circulation function

heat transmission to the food by forced air convection, i.e. by circulating the air with the help of a fan

Note 1 to entry: This does not include circulated air functions which operate a top heating element only (i.e. **grill** element).

3.14

hot steam function

heat transmission to the food by generated steam in combination with radiation and/or convection at ambient pressure (approximately 1 bar) and with a temperature > 100 °C

3.15

steam function

heat transmission to the food mainly by condensation of steam at ambient pressure (approximately 1 bar) and with a temperature ≤ 100 °C

3.16

cooling down period

unstable condition persisting after completion of the active mode and the appliance is **set to off mode** where the power consumption may change without any intervention by the user

3.17

set to off mode

action where the product is switched off using appliance controls or switches that are accessible and intended for operation by the user during normal use to attain the lowest power consumption that may persist for an indefinite time while connected to a main power source and used in accordance with the manufacturer's instructions

Note 1 to entry: All actions required to **set to off mode** such as empty the water tank, remove the food, close the door, etc., have to be taken.

Note 2 to entry: For the definition of off mode IEC 62301 is relevant.

3.18

set to standby mode

action where the product is switched to standby using appliance controls or switches that are accessible and intended for operation by the user during normal use to attain the lowest power consumption that may persist for an indefinite time while connected to a main power source and used in accordance with the manufacturer's instructions

Note 1 to entry: For the definition of standby mode IEC 62301 is relevant.

4 List of measurements

4.1 Dimensions and mass

The following measurements are carried out:

- overall dimensions (see 6.1);
- internal dimensions (see 6.2);
- dimensions of shelves and steaming accessories (see 6.4);
- dimensions of grill grids (see 6.5);
- dimensions of warming compartments (see 6.6);
- level of the shelf (see 6.7);
- mass of the appliance (see 6.8).

4.2 Oven and combi steam oven

The following measurements are carried out:

- preheating the empty **oven** (see 7.2);
- accuracy of the control (see 7.3);
- energy consumption and time for heating a load (see 7.4);
- heat distribution (see 7.5);
- ability to supply heat (see 7.6).

4.3 Steam oven and combi steam oven

The following measurements are carried out:

- ability to supply steam (see 8.1);
- distribution of steam (see 8.2)
- determination of the capacity (see 8.3).

4.4 Grill

The following measurements are carried out:

- grilling area (see 9.2);