# IEC 60350-1

Edition 3.0 2023-03
REDLINE VERSION

# INTERNATIONAL STANDARD

colour inside

## Household electric cooking appliances – Part 1: Ranges, ovens, steam ovens and grills – Methods for measuring performance



IEC 60350-1:2023-03 RLV(en)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# HOUSEHOLD ELECTRIC COOKING APPLIANCES –

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

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**This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60350-1:2016+AMD1:2021 CSV. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.**

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. It is an International Standard.

This third edition cancels and replaces the second edition published in 2016 and Interpretation Sheet 1:2021. This edition constitutes a technical revision.

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

a) new definitions for heating function, eco function and definitions relevant for low power mode considerations are amended in Clause 3;
b) order of clauses is changed;
c) revision of 5.3;
d) update of 6.2 in order to improve the reliability of volume measurement;
e) removal of 6.7, Level of shelf;
f) revision of Clause 7 concerning the accuracy of **eco functions** with residual heat use;
g) revision of Clause 8 in order to improve the reliability of the method for measuring the energy consumption, especially regarding anti-circumvention;
h) unique energy consumption measurement for all **heating functions** and **eco functions** with an indication of the energy consumption for a temperature increase of 165 K (compared to 155 K currently for forced air circulation function, for example), which results in higher energy consumption values compared to the previous edition;
i) $R_y$ replaced by $L^*$ in Clause 9 and reference to IEC TS 63350;
j) cooking time for reference measurement introduced for broccoli in Clause 10;
k) yellow part replaced by hue angle value in Clause 10;
l) requirements for digital assessment (see former 7.5.3.6.3) are obsolete as specified in IEC TS 63350;
m) revision of Clause 14 (Consumption measurement of low power modes, previous Clause 12);
n) former Annex G (informative) is cancelled due to the fact that this method for measuring an associated activity has been not applied;
o) former Annexes B and F are obsolete, up-to-date shade charts are specified in IEC TS 63350;
p) former Annex E will be substituted by a supporting document located on the IEC's website.

The document contains supplementary material highlighted by notes indicating the link.

The text of this International Standard is based on the following documents:

| Draft | Report on voting |
|---|---|
| 59K/365/FDIS | 59K/370/RVD |

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

The language used for the development of this International Standard is English.

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.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

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# 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.

NOTE 1 This document is also applicable to portable appliances with similar functionalities that were previously covered by the withdrawn IEC 61817.

The **ovens** covered by this document ~~may~~ can be with or without microwave function.

Manufacturers ~~should~~ are expected to define the primary cooking function of the appliance – microwave function or thermal heat. The primary cooking function ~~should be~~ is 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~~ is measured as far as it is possible.

NOTE 2 For measurement of energy consumption and time for heating a load (see Clause 8), this document is furthermore not applicable to:

– microwave combination function;
– **ovens** with reciprocating trays or turntable;
– **small cavity ovens** (see 3.16);
– **ovens** without adjustable temperature control;
– **heating functions** and **eco functions** other than defined in this document;
– appliances with only solo **steam function**.

NOTE 3 This document does not apply to

– microwave ovens (IEC 60705).

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

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

NOTE 5 Appliances covered by this document ~~may~~ can 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 are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

IEC 62301:2011, *Household electrical appliances – Measurement of standby power*

IEC TS 63350:2022, *Household electrical appliances – Specification of the properties of a digital system for measuring the performance*

IEC 63474[1], *Electrical and electronic household and office equipment – Measurement of networked standby power consumption of edge equipment*

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.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

**3.1**
**active mode**
mode in which the appliance is connected to a mains power source, has been activated, and is performing any of the intended functions

EXAMPLE Producing heat transfer by thermal heat, electromagnetic energy or condensation

Note 1 to entry: Examples of recognised associated functions include displaying recipes, running an egg timer, software download, running a cooling fan and the like.

**3.2**
**combi steam oven**
appliance or compartment of a **cooking range** in which food is cooked by a combination of **oven** and **steam oven**

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 instruction manual or if the appliance provides a setting for **steam function**.

Note 2 to entry: The term "steam" does not refer to the evaporated water from the food.

**3.3**
**cooking range**
appliance having a **hob** and at least one **oven** and which ~~may~~ can incorporate a **grill**

[1] Under preparation. Stage at the time of publication: IEC CDV 63474:2022.

**3.4**
**delay start**
condition where the user has selected a specified delay to the beginning of any **active mode**

Note 1 to entry: This mode is only applicable if the appliance provides a delay start function for the user.

**3.5**
**eco function**
heat transmission by natural air circulation, forced air circulation or radiation for certain applications using efficient technical solutions

EXAMPLE Technical solutions:

- residual heat usage;
- low-power heating;
- or a combination of both.

**3.6**
**grill**
appliance or part of an appliance in which food is cooked by radiant heating

**3.7**
**heating function**
heat transmission by natural or forced air circulation, or radiation for baking and roasting

EXAMPLE

- Forced air circulation function which heats food mainly by circulating the air with the aid of a fan;
- conventional **heating function** which heats food mainly by natural convection of the air;
- or a combination of both functions.

Note 1 to entry: Heat transmission by steam or by microwave power, also in combination with any **heating function**, is excluded.

**3.8**
**hob**
**cooktop**
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: The **control** unit can be included in the **hob** itself or integrated in a **cooking range**.

**3.9**
**hot steam function**
heat transmission to the food by generated steam in combination with radiation ~~and/~~or convection, or a combination of both, at ambient pressure (approximately ~~1 bar~~ 100 kPa) and with a temperature > 100 °C

**3.10**
**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

**3.11**
**network**
communication infrastructure with a topology of links, an architecture, including the physical components, organizational principles, communication procedures and formats (protocols)

**3.12**
**off mode**
condition in which the appliance is connected to the mains and is not providing any **active mode** or **standby mode** and where the mode can persist for an indefinite time

Note 1 to entry: The following shall also be considered as **off mode:**

a) conditions providing only an indication of **off mode**;

b) conditions providing only functionalities intended to ensure electromagnetic compatibility.

**3.13**
**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

**3.14**
**oven thermostat**
device or sensor that detects the temperature inside the cavity in order to control the set temperature

**3.15**
**oven with catalytic cleaning**
**oven** in which cooking deposits are removed by breaking them down on a special coating

**3.16**
**small cavity oven**
**oven** with the following dimensions:

– both ~~usable~~ internal width and ~~usable~~ internal depth are < 250 mm, or

– either one of internal width and internal depth is < 120 mm. or

– ~~usable~~ internal height is < 120 mm

Note 1 to entry: The defined maximum size of small cavity **ovens** in this document is ~~due~~ adapted to the size of the test load used in Clause 8.

**3.17**
**standby mode**
condition where the appliance is connected to the mains and provides only the following functions, which can persist for an indefinite duration:

(a) reactivation function, or reactivation function and a mere indication of enabled reactivation function;

(b) information or status display;

(c) detection function for emergency measures.

**3.18**
**standby mode in condition of networked standby**
condition where the appliance is connected to the mains and provides only the reactivation function through a connection to a **network**, which can persist for an indefinite duration

Note 1 to entry: This mode is only applicable to appliances that provide a connection function to a **network.**

**3.19**
**pyrolytic self-cleaning oven**
**oven** in which cooking deposits are removed by heating the **oven** to a sufficiently high temperature

**3.20**
**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: The term "steam" does not refer to the evaporated water from the food.

**3.21**
**steam function**
heat transmission to the food mainly by condensation of steam at ambient pressure (approximately ~~1 bar~~ 100 kPa) and with a temperature ≤ 100 °C

**3.22**
**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

~~**3.12**~~
~~**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).~~

~~**3.16**~~
~~**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.~~