SLOVENSKI STANDARD
oSIST prEN IEC 60705:2024

01-januar-2024

Gospodinjske mikrovalovne pečice - Metode za merjenje lastnosti

Household microwave ovens - Methods for measuring performance

Mikrowellengeräte für den Hausgebrauch und ähnliche Zwecke - Verfahren zur Messung der Gebrauchstauglichkeit

Fours à micro-ondes à usage domestique - Méthodes de mesure de l'aptitude à la fonction

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COMMITTEE DRAFT FOR VOTE (CDV)

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IEC SC 59K : PERFORMANCE OF HOUSEHOLD AND SIMILAR ELECTRICAL COOKING APPLIANCES	
SECRETARIAT: Germany	SECRETARY: Ms Susanne Stolz
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☒ ENVIRONMENT ☒ QUALITY ASSURANCE ☐ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING **Attention IEC-CENELEC parallel voting** The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

Household microwave ovens - Methods for measuring performance

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HOUSEHOLD MICROWAVE OVENS – METHODS FOR MEASURING PERFORMANCE

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 60705 has been prepared by subcommittee 59K: Performance of household and similar cooking appliances, of IEC technical committee 59: Performance of household and similar electrical appliances. It is an International Standard.

This 5th edition cancels and replaces the 4th edition published in 2010, Amendment 1: 2014 and Amendment 2: 2018. This edition constitutes a technical revision.

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

a) thematically ordered new sequence of the clauses;
b) updated normative references;
c) introducing a new definition for microwave generator to open the standard for microwave ovens with one or more magnetrons or solid-state components;
d) alignment with IEC 60350-1 Ed. 3.0 regarding the definitions and references;
e) remove the definitions for set to off mode (3.7) and set to standby mode (3.8);
f) adding new definitions regarding low power modes;
g) aligning the low power mode measurement, clause 11, to IEC 60350-1:2013;
h) revision of square tank tests to one new clause 12.2;

i) revision of the dishes used for clause 12, 13 and 14 and removal of Annex B;

j) remove of A.3.3 Defrosting of gel berries;

k) remove of Annex F for measuring the energy consumption of the cooling down period;

l) 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
XX/XX/FDIS	XX/XX/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.

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.

HOUSEHOLD MICROWAVE OVENS – METHODS FOR MEASURING PERFORMANCE

1 Scope

This document applies to **microwave ovens** for household and similar use, it also applies to **microwave ovens with grills** and **combination microwave ovens**.

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

NOTE 1 This document does not deal with safety requirements (see IEC 60335-2-25 [1] and IEC 60335-2-90 [2].

NOTE 2 This document does not apply to appliances incorporating conventional heating means, steam function or hot steam function only. (see IEC 60350-1).

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 60350-1:2023, *Household electric cooking appliances – Part 1: Ranges, ovens, steam ovens and grills – Methods for measuring performance*

IEC 60584-1, *Thermocouples – Part 1: EMF specification and Tolerances*

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

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

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

Examples: Producing heat transfer by electromagnetic energy, thermal heat, or the combination from them.

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

3.2
combination microwave function
heat transfer by electromagnetic energy simultaneously or consecutively with energy transfer by a heating function, by hot steam or by steam

Note 1 to entry: For definitions of a heating function, hot steam function and steam function, IEC 60350-1 is relevant.

3.3

combination microwave oven
appliance which can be operated by **microwave function, combination microwave function**, heating function

Note 1 to entry: For the definition of a heating function IEC 60350-1 is relevant.

3.4
food support
horizontal support in the cavity on which the load is placed

NOTE 1 to entry If the appliance is fitted with a turntable, the turntable is the **food support**. The **food support** can also be a shelf or a reciprocating tray. If recommended by manufacturer's instruction also the cavity bottom can be the **food support**.

3.5

microwave function
function using only electromagnetic energy in one or several of the ISM frequency bands between 300 MHz and 30 GHz for heating food and beverages in a cavity

3.6
microwave function with grill
heat transfer by electromagnetic energy simultaneously or consecutively with energy transfer by radiant heat typically from the top of the cavity

Note 1 to entry: For a definition of a grill, IEC 60350-1 is relevant.

3.7
microwave generator
device in an appliance for generating microwave energy, i.e. one or more magnetrons or solid-state components

3.8
microwave oven
appliance using only electromagnetic energy in one or several of the ISM frequency bands between 300 MHz and 30 GHz, for heating food and beverages in a cavity

NOTE 1 to entry ISM frequency bands are the electromagnetic frequencies established by the ITU and reproduced in CISPR 11 [3].

3.9
microwave transparent
property of a material with microwaves passing through, having negligible absorption and reflection

NOTE 1 to entry: The relative permittivity of a microwave transparent material is less than 7 and the relative loss factor is less than 0,015.

3.10

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

3.11

off mode
condition in which the appliance is connected to the mains and is not providing any active mode or standby function and where the mode may 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.

3.12
rated voltage
voltage assigned to the appliance by the manufacturer

3.13

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

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

b) information or status display; and/or

c) detection function for emergency measures.

3.14 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**.

4 Classification

4.1 According to type

Appliances are classified according to their type and characteristics.

– **Microwave oven**

– **Combination microwave oven**

– **Microwave oven with grill**

The manufacturers shall define the primary cooking function of the appliance, **microwave function** or thermal heat. The primary cooking function has to be measured with an existing method according to energy consumption.

If the primary cooking function is declared as a **microwave function**, IEC 60705 shall be applied for energy consumption measurement. If the primary cooking function is declared as a thermal heat, IEC 60350-1 shall be applied for energy consumption measurement. If the manufacturer does not declare the primary function, the performance of the microwave function and thermal heat is measured as far as it is possible."

NOTE There is currently no measurement method for the energy consumption for grilling and steam functions.

The type shall be stated in the report.

4.2 According to characteristics

– Usable cavity dimensions

– Dimensions of shelves

– Moved **food support**, e.g. reciprocating tray, turntable

– Possible thermal heating modes (grilling, heating function, steam function etc.), combination modes.

The characteristics shall be stated in the report.

5 List of measurements

Table 1 shows which measurement shall be applied for the relevant function.

Table 1 – List of measurements

Measurements	Clause or subclause	Applicable to				
		microwave function	microwave function with grill	microwave function in combination with heating function	microwave function in combination with hot steam	microwave function in combination with steam
Dimensions and volume	7	Applicable to all appliances which are under the scope.				
Microwave power output	8	x	-	-	-	-
Efficiency	9	x	-	-	-	-
Energy consumption	10	x	-	-	-	-
Consumption measurement of low power modes	11	Applicable to all appliances which are under the scope.				
Square tank	12.2	x	-	-	-	-
Multiple beakers	12.3	x	-	-	-	-
Heating beverages	13	x	-	-	-	-
Egg custard	14.3.1	x	-	-	-	x
Sponge cake	14.3.2	x	-	-	-	x
Meatloaf	14.3.3	x	-	-	-	x
Potato gratin	14.3.4	-	x	x	x	-
Cake	14.3.5	-	x	x	x	-
Chicken	14.3.6	-	x	x	x	-
Meat defrosting	15	x	-	-	-	x
For definition of grill, heating function, hot steam function and steam function IEC 60350-1 is relevant.						

6 General conditions for measurements

6.1 General

Unless otherwise specified, the measurements are made under the following conditions.

When a metal **food support** is provided and used for the measurements, the load position and the corresponding shape of the metal **food support** shall be reported.

If not otherwise specified the **food support** is placed in the cavity in its lowest position.

NOTE The positioning influences the repeatability of the test results.

If numbers have to be rounded, they shall be rounded according to ISO 80000-1:2009, Annex B.3 Rule B. If the rounding takes place to the right of the comma, the omitted places shall not be filled with Zeros.

6.2 Supply voltage

The supply voltage shall be maintained at the main terminal at **rated voltage** ±1 %, while the microwave operation is switched on. If the appliance has a rated voltage range, the tests are carried out at the nominal voltage of the country where the appliance is intended to be used. The supply frequency shall be at rated frequency ±1 %.

The supply voltage measured during the tests shall be recorded.