

CONSOLIDATED VERSION

VERSION CONSOLIDÉE



Household microwave ovens – Methods for measuring performance

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

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**HOUSEHOLD MICROWAVE OVENS –
METHODS FOR MEASURING PERFORMANCE**

FOREWORD

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This Consolidated version of IEC 60705 bears the edition number 4.1. It consists of the fourth edition (2010-04) [documents 59K/195/FDIS and 59K/198/RVD] and its amendment 1 (2014-06) [documents 59K/252/FDIS and 59K/255/RVD]. The technical content is identical to the base edition and its amendment.

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through. A separate Final version with all changes accepted is available in this publication.

This publication has been prepared for user convenience.

International Standard IEC 60705 has been prepared by subcommittee 59K: Ovens and microwave ovens, cooking ranges and similar appliances, of IEC technical committee 59: Performance of household and similar electrical appliances.

The main changes from the previous edition are as follows:

- the definition of rounding is given in 3.5;
- the usable volume and the overall volume are respectively determined in 7.2 and 7.3.

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

In this standard, the following print types are used:

- *test specifications: in italic type*
- notes: in small roman type
- other texts: in roman type.

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

This standard contains an attached file in the form of an Excel®¹ 97-2003 data sheet program. This file is intended to be used as a complement and does not form an integral part of the standard.

The following differences exist in some countries:

Clause 7: Metric dimensional measures are not in common use (USA).

The committee has decided that the contents of the base publication and its amendment 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

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INTRODUCTION to Amendment 1

This amendment includes the following significant technical changes:

- the usable volume is renamed to calculated volume and the measurement method for the calculated volume is revised (see 7.2), which is in accordance with IEC 60350-1;
- new definitions for **microwave function**, **combination microwave function**, **set to off mode**, **set to standby mode**, **cooling down period** and **food support** in Clause 3;
- a method for measuring the energy consumption of the **microwave function** in Clause 14;
- more precise requirements for instruments and measurements in Table 2;
- additional product specific requirements for measuring the energy consumption of low power modes in Clause 15;
- a method for measuring the energy consumption for the **cooling down period** in Annex F (informative).

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HOUSEHOLD MICROWAVE OVENS – METHODS FOR MEASURING PERFORMANCE

1 Scope

This International Standard applies to **microwave ovens** for household use. It also applies to **combination microwave ovens**.

This standard defines the main performance characteristics of household microwave ovens which are of interest to the user, and it specifies methods for measuring these characteristics.

NOTE 1 This standard does not deal with

- **microwave** ovens which cannot accept a load having a diameter of ≥ 200 mm or a height of ≥ 120 mm;
- safety requirements (see IEC 60335-2-25 [1]* and IEC 60335-2-90 [2]).

NOTE 2 This standard does not apply to ovens incorporating conventional heating means only (see IEC 60350) [3].

2 Normative references

The following referenced documents are indispensable for the application 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 60350-1:2011, *Household electric cooking appliances – Part 1: Ranges, ovens, steam ovens and grills – Methods for measuring performance*

IEC 60584-2, *Thermocouples – Part 2: 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 purpose of this document, the following terms and definitions apply.

3.1

microwave oven

appliance using electromagnetic energy in the ISM frequency band of 2 450 MHz, for heating food and beverages in the cavity

~~NOTE 1—The microwave oven may incorporate a browning element.~~

NOTE 2¹ ISM frequency bands are the electromagnetic frequencies established by the ITU and reproduced in CISPR 11 [4].

* Figures in square brackets refer to the bibliography.

3.2 combination microwave oven

microwave oven in which the microwave energy is combined with thermal energy

NOTE Energy transfer by steam is included in the term thermal heat.

3.3 microwave transparent

property of a material having negligible absorption and reflection of microwaves

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

3.4 rated voltage

voltage assigned to the appliance by the manufacturer

3.5 microwave function

heat transfer exclusively by electromagnetic energy in the ISM frequency band of 2 450 MHz

3.6 combination microwave function

heat transfer by electromagnetic energy simultaneously or sequentially with thermal heat

NOTE Thermal heat can be a conventional heating function, a forced air circulation function, a hot steam function or steam function. These functions are defined in 3.12 to 3.15 of IEC 60350-1:2011.

3.7 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 All actions required to **set to off mode** like for example empty the water tank, remove food, close the door, etc. have to be taken.

NOTE 2 See 3.5 of IEC 62301:2011 for the definition of "off mode".

3.8 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 See 3.6 of IEC 62301:2011 for the definition of "standby mode".

3.9 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

3.10 food support

horizontal support in the cavity on which the load is placed

NOTE 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**.

4 Classification

Appliances are classified according to their type and characteristics.

4.1 According to type

- Microwave ovens
- Combination microwave ovens

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.

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

The type of oven shall be stated in the report.

4.2 According to characteristics

- Usable cavity dimensions
- ~~With or without a turntable~~
- Dimensions of shelves
- Moved **food support**, e.g. reciprocating tray, turntable
- Possible thermal heating modes (grilling, hot air, steam function etc.).

The characteristics of the oven shall be stated in the report.

5 List of measurements

Performance is measured by the tests listed in Table 1.