



Légende

Anglais	Français
Set to off mode	Mise en mode arrêt
Cooling down period for 15 min ± 1 min	Période de refroidissement pendant 15 min ± 1 min
transition to low power mode	transition en mode faible puissance
Energy consumption according to Clause 14	Consommation d'énergie selon l'Article 14
unload oven and close the door 30 s ± 2 s after switching off	vider le four et fermer la porte 30 s ± 2 s après l'arrêt
cooling down period	période de refroidissement

Figure F.1 – Phases de mesure de la consommation d'énergie – exemple

On interrompt la mesure après 15 min ± 2 s indépendamment de l'arrêt automatique de la ventilation.

La consommation d'énergie pour la **période de refroidissement** W_v est notée en Wh pour chaque charge.

S'assurer que les conditions suivantes restent applicables pendant la durée de la mesure:

- raccordement au secteur pendant la durée de l'essai;
- aucun réseau n'est connecté au produit.

Bibliographie

- [1] IEC 60335-2-25:2002, *Appareils électrodomestiques et analogues – Sécurité – Partie 2-25: Règles particulières pour les fours à micro-ondes, y compris les fours à micro-ondes combinés*
 - [2] IEC 60335-2-90:2006, *Appareils électrodomestiques et analogues – Sécurité – Partie 2-90: Règles particulières pour les fours à micro-ondes à usage commercial*
 - [3] IEC 60350:1999, *Cuisinières, foyers de cuisson, fours électriques et grils à usage domestique – Méthodes de mesure de l'aptitude à la fonction*
 - [4] CISPR 11:2009, *Appareils industriels, scientifiques et médicaux – Caractéristiques de perturbations radioélectriques – Limites et méthodes de mesure*
-

FINAL VERSION

VERSION FINALE



Household microwave ovens – Methods for measuring performance

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

This is a preview. [Click here to purchase the full publication.](#)

CONTENTS

FOREWORD.....	5
INTRODUCTION to Amendment 1.....	7
1 Scope.....	8
2 Normative references.....	8
3 Terms and definitions	8
4 Classification	10
4.1 According to type.....	10
4.2 According to characteristics	10
5 List of measurements	10
6 General conditions for measurements	11
6.1 General.....	11
6.2 Supply voltage.....	12
6.3 Test room.....	12
6.4 Water	12
6.5 Initial condition of the oven	12
6.6 Control setting	12
6.7 Instruments and measurements	13
6.8 Positioning the appliance	13
7 Dimensions and volume	13
7.1 External dimensions	13
7.2 Usable internal dimensions and calculated volume	14
7.2.1 General	14
7.2.2 Usable height.....	17
7.2.3 Usable width	17
7.2.4 Usable depth	17
7.2.5 Reciprocating tray.....	17
7.2.6 Calculated volume	17
7.2.7 Dimensions of food support.....	18
7.3 Overall internal dimensions and overall volume	18
7.3.1 General	18
7.3.2 Overall height (<i>H</i>)	18
7.3.3 Overall width (<i>W</i>)	18
7.3.4 Overall depth (<i>D</i>)	18
7.3.5 Overall volume of rectangular cavities	18
7.3.6 Overall volume of non-rectangular cavities	19
8 Determination of microwave power output	19
9 Efficiency.....	20
10 Technical tests for performance	20
10.1 General	20
10.2 Square tank test	20
10.2.1 Procedure.....	20
10.2.2 Evaluation.....	21
10.3 Multiple cup test	21
10.3.1 Procedure.....	21
10.3.2 Evaluation.....	24

11	Heating performance	24
11.1	Heating beverages.....	24
11.1.1	General	24
11.1.2	Procedure.....	24
11.1.3	Evaluation.....	25
11.2	Heating simulated food	25
11.2.1	Test purpose	25
11.2.2	Procedure.....	25
11.2.3	Evaluation.....	26
12	Cooking performance.....	26
12.1	General	26
12.2	Evaluation	26
12.3	Tests	27
12.3.1	Egg custard	27
12.3.2	Sponge cake.....	27
12.3.3	Meatloaf	28
12.3.4	Potato gratin	29
12.3.5	Cake.....	30
12.3.6	Chicken	30
13	Defrosting performance	31
13.1	General	31
13.2	Evaluation	31
13.3	Meat defrosting.....	32
13.3.1	Purpose of test	32
13.3.2	Container.....	32
13.3.3	Ingredients	33
13.3.4	Procedure.....	33
14	Energy consumption for the microwave function	34
14.1	General	34
14.2	Test load	34
14.3	Preparation.....	34
14.4	Positioning the load in the appliance	35
14.5	Measurement of energy consumption for a cooking cycle	35
14.6	Calculation for the energy consumption of a cooking cycle	36
14.7	Final result	37
14.8	Reporting of test results.....	37
15	Consumption measurement of low power modes	37
	Annex A (informative) Regional defrosting tests.....	39
	Annex B (informative) Dishes for Clause 12 and 13	41
	Annex C (informative) Stirrer	42
	Annex D (informative) Glass container for Clauses 8 and 14.....	43
	Annex E (informative) Data and calculation sheet: Energy consumption for a cooking cycle with microwave function (Clause 14).....	44
	Annex F (informative) Energy consumption for the cooling down period	46
	Bibliography	48

Figure 1 – External dimensions of the microwave oven	14
Figure 2a – Gauge for determining the usable volume	15
Figure 2 – Usable internal dimensions	16
Figure 3 – Square tank	21
Figure 4 – Cup	22
Figure 5 – Cup positions for the test of 10.3	23
Figure 6 – Cup position for the test of 11.1	24
Figure 7 – Rectangular tank	25
Figure 8 – Shallow dish	33
Figure C.1 – Plastic stirring adapter.....	42
Figure C.2 – Example stirrer.....	42
Figure D.1 – Example: small beaker (600 ml)	43
Figure F.1 – Phases of energy consumption measurement – example	47
 Table 1 – List of measurements	 11
Table 2 – Instruments	13
Table 3 – Measurements	13
Table 4 – Test loads for measuring the energy consumption	34
Table D.1 – Specification – glass containers.....	43

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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.

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted 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

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

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.

¹ Excel® is the trademark of a product supplied by Microsoft®. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the product named. Equivalent products may be used if they can be shown to lead to the same results.

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).

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 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.