

INTERNATIONAL STANDARD

AMENDMENT 1

**Household and similar electrical appliances – Safety –
Part 2-90: Particular requirements for commercial microwave ovens**

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FOREWORD

This amendment has been prepared by subcommittee 61B: Safety of microwave appliances for household and commercial use, of IEC technical committee 61: Safety of household and similar electrical appliances.

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

CDV	Report on voting
61B/618/CDV	61B/631/RVC
61B/619/CDV	61B/632/RVC
61B/617/CDV	61B/633/RVC
61B/616/CDV	61B/634/RVC
61B/612/CDV	61B/635/RVC
61B/620/CDV	61B/636/RVC

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

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations can need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

A bilingual version of this publication may be issued at a later date.

1 Scope

Replacement:

Replace the first dashed item of NOTE 105 with the following:

- for appliances intended to be used in vehicles or on trains, on board ships or board aircraft, additional requirements may be necessary;

2 Normative references

Add the following references to the existing list:

IEC 60335-2-36, Household and similar electrical appliances – Safety – Part 2-36: Particular requirements for commercial electric cooking ranges, ovens, hobs and hob elements

IEC 60335-2-42, Household and similar electrical appliances – Safety – Part 2-42: Particular requirements for commercial electric forced convection ovens, steam cookers and steam convection ovens

IEC 60335-2-49, Household and similar electrical appliances – Safety – Part 2-49: Particular requirements for commercial electric hot cupboards

IEC 60335-2-75, Household and similar electrical appliances – Safety – Part 2-75: Particular requirements for commercial dispensing appliances and vending machines

3 Definitions

Replace the title of this clause, not the numbering, with “**Terms and definitions**”.

3.113 microwave enclosure

Renumber Note 2 with Note 1 and Note 3 with Note 2

11 Heating

11.7 Add the following text after the first sentence:

The last cycle does not include a rest period of 1 min.

15 Moisture resistance

15.2 Replace the text of the addition with the following:

A quantity of 0,5 l of the same spillage solution is poured steadily over the **shelf** over a period of 1 min. If the **shelf** can collect spilled liquid, it is filled with the solution and a further 0,5 l is then added over a period of 1 min.

15.101 Replace the first and second paragraph of the compliance criterion with the following:

The probe is completely immersed in water containing approximately 1 % NaCl and having a temperature of $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. The solution is heated to the boiling point in approximately 15 min. The probe is then removed from the boiling solution and immersed in the solution having a temperature of $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for 30 min.

This procedure is carried out five times, after which the probe is removed from the solution. All traces of liquid are then removed from the surface.

Replace the Note with the following:

NOTE Detachable temperature-sensing probes are not connected to the appliance for this test. Non-detachable temperature-sensing probes are tested in the cavity, the probe being immersed as much as possible.

19 Abnormal operation

19.13 Replace the first sentence of the first paragraph with the following.

During the tests, the temperature of windings shall not exceed the values shown in Table 8.

19.101 Add the following text after the last paragraph:

If microwave leakage exceeds 100 W/m², the following alternative measurement method shall be applied, which modifies the microwave leakage limit of 19.13.

In order to identify and mark all spots where peak values of microwave leakage exceed 100 W/m², the instrument antenna is moved again over the external surface of the appliance, particular attention being given to the door and its seals.

NOTE 1 A peak hold function of the measurement instrument, if any, can be activated for identification of spots where peak values of microwave leakage exceeds 100 W/m².

The leakage values of each such spot shall be recorded and the averaged leakage value of any spot over the most onerous 20 s shall not exceed 100 W/m². Furthermore, the peak value shall not exceed 500 W/m².

NOTE 2 Since the stirrer and/or turntable revolution time and the number of microwave stirrer blades determine the frequency and duration of actual peak leakage values, instruments with appropriate specifications (like minimum sampling time, capability to measure peak values of power flux density, capability to average these values) can be used.

19.102 Replace the current NOTE with the same normative text and add the following text:

These short-circuits are applied one at a time.

19.104 Replace Table 101 with the following new table:

Table 101 – Number of potatoes

Rated microwave power output <i>W</i>	Volume of the cavity <i>l</i>	Number of potatoes
<600	≥14 and <28	2
≥600 and <1 000	≥28 and <42	4
≥1 000 and <2 000	≥42 and <56	6
≥2 000	≥56	6 + N ^a
NOTE The rated microwave power output or the volume of the cavity applies, whichever results in the higher number of potatoes.		
^a N is 2 for each 500 W increase in power output or for each 14 l increase in volume.		

20 Stability and mechanical hazards

20.101 Replace the fifth paragraph with the following:

For appliances normally used on a table, the mass is

- 7 kg for **stationary appliances**;
- 3,5 kg for **portable appliances**.

21 Mechanical strength

Add, before 21.101, the following new Subclause 21.2:

21.2 Addition:

Compliance is also checked by the tests of 21.101 to 21.105.

During these tests, the appliance is rigidly supported, except for 21.102.

21.1

Delete this subclause.

22 Construction

22.102 *Replace the first paragraph with the following:*

Oven vents shall be constructed so that any moisture or grease discharged through them cannot affect **clearances** and **creepage distances** between **live parts** and other parts of the appliance.

22.106 *Replace the first paragraph with the following:*

The supervision device of each **monitored door interlock** shall render the appliance inoperable if its switching part fails to control the microwave generator.

Replace Note 4 with the following:

NOTE 4 For appliances having a **rated voltage** under 150 V and those with a **rated current** over 20 A, the test with the series impedance is not carried out.

22.112 *Replace the third sentence of first paragraph of the compliance criterion with the following:*

*The force is then released and, if the oven can be operated with the **temperature-sensing probe** still being placed in the trapped position, the microwave leakage is measured under the conditions specified in Clause 32 and shall not exceed 100 W/m².*

22.117 *Replace this subclause with the following:*

22.117 Where interlocks are required to comply with this standard and are operated by **detachable parts**, they shall be guarded so that accidental operation is prevented.

Compliance is checked by inspection and by manual test with test probe B.

22.118 *Replacement:*

Replace the requirement with the following:

Lights, switches or push-buttons for the indication of danger, alarm or similar situations shall be coloured red.

Add the following new subclause:

22.121 For appliances that are controlled by programmable **electronic circuits** that limit the number of heating elements and motors from being energised at the same time, simultaneous activation of any combination of heating elements and motors shall not render the appliance unsafe.

Compliance is checked as follows:

- the fault/error conditions specified in Table R.1 are applied and evaluated in accordance with the relevant requirements of Annex R; or
- the appliance is operated under conditions of Clause 11 while being supplied at **rated voltage**, the programmable **electronic circuits** being modified to allow simultaneous activation of all heaters and motors under their control.

Under these conditions, compliance with 19.13 shall be fulfilled.

27 Provision for earthing

Add the following new subclause:

27.1

NOTE 101 For **class I appliances**, one pole of the output of power supply of microwave generator, if any, is earthed for functional purposes.

Annex A – Routine tests

A.103 Microwave leakage

Replace the existing text of the last paragraph with the following:

The microwave leakage shall not exceed

- 50 W/m² for **microwave ovens** not covered by Annex BB, or
- 50 W/m², averaged over the most onerous 20 s interval and 500 W/m² measured as peak value for **microwave ovens** covered by Annex BB,

as recorded with an instrument fulfilling at least the specifications in A.104 regarding its proper function.

A.104 Microwave leakage instrument minimum specifications

Replace the existing text of subclause A.104 by the following new text:

The following specification applies only for routine tests and may also apply for checks of **microwave ovens** after repair or servicing. Instruments for type testing shall fulfil more stringent requirements, which are obtained from National bodies responsible for protection against non-ionising radiation.

A.104.1 *Instruments shall be subjected to regular checks by carrying out the following tests, to ensure their proper function is maintained. The tests for instrument compliance are made at room temperature. For carrying out the tests, the position of the field sensor shall be known and preferably be marked. In order to allow the measurements specified in A.104.2, the minimum resolution of the instrument under test shall be 1 W/m².*

A.104.2 The checks are carried out either using a generator set-up in an anechoic chamber, or using a reference instrument in substitution mode. The far field shall be linearly polarized. The field sensor of the instrument under test (IUT) shall be placed at the position of the reference field, where the flux density is 10 W/m² or 50 W/m², depending on the task. The range selector, if any, shall be set to the most appropriate range to measure a flux density of 10 W/m² or 50 W/m², depending on the task and with a tolerance from –40 % to +60 %. By slowly rotating the IUT field sensor for 360° around its axis which is aligned to the propagation direction of the far field and directed towards the radiation source, the minimum and maximum readings shall be found and recorded. If the deviation of minimum and maximum readings is less than or equal to ± 2 dB (i.e. from –37 % to +58 %) related to the reference field, it is assumed that the IUT complies with this standard.

Annex AA – Combination microwave ovens

Add the following text after the first paragraph:

For **combination microwave ovens**, IEC 60335-2-36 is also applicable, for **combination microwave ovens** with convection or steam function, IEC 60335-2-42 is also applicable, for **combination microwave ovens** with the function of keeping food and crockery warm, IEC 60335-2-49 is also applicable and for **combination microwave ovens** in conjunction with dispensing appliances or vending machines, IEC 60335-2-75 is also applicable.

AA.3 Definitions

Replace the title of this clause, not the numbering, with “**Terms and definitions**”.

Annex BB – Requirements for commercial microwave ovens without a cavity door and with conveyor-type means

BB.3 Definitions

Replace the title of this clause, not the numbering, with “**Terms and definitions**”.

Annex EE – Microwave ovens intended to be used on board ships

EE.7 Marking and instructions

EE.7.12 Add the following new text before the modification:

The instructions for **microwave ovens** that are intended to be used on board ships shall state:

CAUTION: Verify that the voltage and frequency of the mains supply of the ship matches the **rated voltage** and **rated frequency** or **rated frequency range** of the **microwave oven**.

Bibliography

Delete the following references from the addition:

IEC 60335-2-36, Household and similar electrical appliances – Safety – Part 2-36: Particular requirements for commercial electric cooking ranges, ovens, hobs and hob elements