

Specification for

Safety of household and similar electrical appliances

Part 2. Particular requirements

Section 2.25 Microwave ovens

The European Standard EN 60335-2-25 : 1995, with the incorporation of its amendment No. 1 : 1997, has the status of a British Standard

ICS 97.040.20

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee CPL/61, Safety of electrical appliances, upon which the following bodies were represented:

Agricultural Engineers' Association
 Association of Consulting Scientists
 Association of Control Manufacturers (TACMA (BEAMA Ltd.))
 Association of Manufacturers of Domestic Electrical Appliances
 British Cable Makers' Confederation
 British Electrotechnical Approvals Board
 British Pest Control Association
 British Retail Consortium
 Cesa (the Association of Catering Equipment Manufacturers and Importers)
 Consumer Policy Committee of BSI
 Consumers' Association
 Department of Trade and Industry (Consumer Safety Unit, CA Division)
 ERA Technology Ltd.
 Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)
 Electricity Association
 Health and Safety Executive
 Industrial Cleaning Machine Manufacturers' Association (BEAMA Ltd.)
 Institute of Trading Standards Administration
 Institution of Electrical Engineers
 Loss Prevention Council
 Ministry of Defence
 Portable Electric Tool Manufacturers' Association
 Rotating Electrical Machines Association (BEAMA Ltd.)
 Royal Society for the Prevention of Accidents
 Small Electrical Appliances Marketing Association

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

British Bathroom Council
 British Warm Air Hand Dryer Association
 Institute of Dermatology
 Lighting Industry Federation Ltd.
 National Radiological Protection Board

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on
 15 April 1996

© BSI 1997

First published 1991
 Second edition 1996

The following BSI references relate to the work on this standard:
 Committee reference CPL/61
 Draft for comment 90/34466 DC

ISBN 0 580 25245 0

Amendments issued since publication

Amd. No.	Date	Text affected
9646	November 1997	Indicated by a double sideline in the margin

Summary of pages

The following table identifies the current issue of each page. Issue 1 indicates that a page has been introduced for the first time by amendment. Subsequent issue numbers indicate an updated page. Vertical sidelining on replacement pages indicates the most recent changes (amendment, addition, deletion).

Page	Issue	Page	Issue
Front cover	2	3 - 5	original
Inside front cover	2	6 - 8	2
a	1	8a	1
b	blank	8b	blank
i	original	9 - 31	original
ii	2	32 - 33	blank
EN cover page	2	34	original
2	2	Inside back cover	original
		Back cover	original

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	2
Text of EN 60335-2-25	4
National annex NA (informative) Original IEC text prior to amendment by CENELEC common modifications	34

National foreword

This British Standard has been prepared by Technical Committee CPL/61 and is the English language version of EN 60335-2-25 : 1995 *Safety of household and similar electrical appliances Part 2. Particular requirements for microwave ovens*, including amendment A.1, published by the European Committee for Electrotechnical Standardization (CENELEC). It was derived from IEC 335-2-25 : 1993, including Amendment 1, published by the International Electrotechnical Commission (IEC) which has the same title as the European Standard.

The CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by a side line in the margin. Parts of the original text that have been modified by CENELEC are quoted in national annex NA.

This British Standard is to be read in conjunction with BS 3456 : Part 201 : 1990 *General requirements*, including the amendments shown in the following table, which supplement and modify BS 3456 : Part 201. Those which apply to this British Standard are indicated by an asterisk.

Amendment to BS 3456 : Part 201 : 1990	Amendment to EN 60335-1 : 1988 ¹⁾	Amendment to IEC 335-1 : 1976
Amendment No 1 : 1990*	Amendment 2 : 1988	Amendment No 4 : 1984
Amendment No 2 : 1990*	Amendment 5 : 1989	Amendment No 5 : 1986
Amendment No 3 : 1990*	Amendment 6 : 1989	Amendment No 6 : 1988
Amendment No 4 : 1992*	Amendment A51 : 1991	—
Amendment No 5 : 1992*	Amendment A52 : 1992	—
Amendment No 6 : 1992*	Amendment A53 : 1992	—
Amendment No 7 : 1993*	Amendment A54 : 1992	—
Amendment No 8 : 1993*	Amendment A55 : 1993	—
Amendment No 9 : 1993*	Corrigendum to Amendment A55 : 1993	—
Amendment No 10 : 1994*	Corrigendum to EN 60335-1 : 1988	—
Amendment No 11 : 1995*	Amendment A56 : 1995	—
¹⁾ These amendments to EN 60335-1 implement, with additions and modifications, the corresponding amendments to IEC 335-1.		

The foreword of EN 60335-2-5 makes reference to the date of withdrawal, dow, of the relevant national standard. In this case the relevant national standard is BS EN 60335-2-25 : 1991 which will be withdrawn on 1 January 1998 in accordance with the CENELEC Internal Regulations. Certificates and marks will not be awarded after this date with regard to the withdrawn British Standard. However such certificates and marks, already awarded may continue to apply to production until 1 January 2003.

Cross-references

Publication referred to	Corresponding British Standard
EN 60335-2-6 : 1990	BS EN 60335 <i>Specification for safety of household and similar electrical appliances</i> BS EN 60335-2 <i>Particular requirements</i> BS EN 60335-2-6 : 1991 <i>Cooking ranges, cooking tables, oven and similar appliances for household use.</i>
IEC 384-14 : 1981	BS 6201 <i>Fixed capacitors for use in electronic equipment</i> Part 3 : 1982 <i>Specification for fixed capacitors for radio interference suppression. Selection of methods of test and general requirements</i>

Product approval. Attention is drawn to the fact that the products conforming to this British Standard may be approved by the British Electrotechnical Approvals Board for the purposes of participation in the CENELEC Certification Agreement and in the CB Scheme of the IECEE. (Details of the BEAB Approvals Scheme are given on the inside back cover).

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Descriptors: Household electrical appliances, microwave ovens, safety requirements, protection against electric shock, fire protection, protection against mechanical hazard

English version

Safety of household and similar electrical appliances Part 2: Particular requirements for microwave ovens

(IEC 335-2-25 : 1993, modified includes amendment A1 : 1997)

Sécurité des appareils électrodomestiques et
analogues
Partie 2: Règles particulières pour les fours à
micro-ondes
(CEI 335-2-25 : 1993, modifiée
inclut l'amendement A1 : 1997)

Sicherheit elektrischer Geräte für den
Hausgebrauch und ähnliche Zwecke
Teil 2: Besondere Anforderungen für
Mikrowellengeräte
(IEC 335-2-25 : 1993, modifiziert
enthält Änderung A1 : 1997)

This European Standard was approved by CENELEC on 1995-07-04. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Foreword

The proposal to endorse IEC 335-2-25 : 1993, document CLC/TC 61 (SEC) 922, was circulated under the enquiry procedure in September 1993. This proposal was discussed during the Oslo meeting in April 1994, when it was decided to submit a draft for EN 60335-2-25 to the voting procedure.

This draft was circulated in November 1994 and was ratified by CENELEC as EN 60335-2-25 on 1995-07-04.

This European Standard has been prepared by the secretariat of CENELEC Technical Committee TC 61.

The following dates are applicable:

- latest date of publication of an identical national standard (dop) 1996-01-01
- latest date of withdrawal of conflicting national standards (dow) 1998-01-01

For products which have complied with EN 60335-2-25 : 1990 including its amendments A51 : 1992 and A2 : 1993 before 1998-01-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2003-01-01.

This standard has to be used in conjunction with EN 60335-1 : 1988, *Safety of household and similar electrical appliances, Part 1: General requirements*, including its amendments A2 : 1988, A5 : 1989, A6 : 1989, A51 : 1991, A52 : 1992, A53 : 1992, A54 : 1992, A55 : 1993 and A56 : 1995.

Where a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies as far as is reasonable. Where this standard states 'addition', 'modification' or 'replacement', the relevant text of Part 1 is to be adapted accordingly.

Subclauses and figures which are additional to those in Part 1 are numbered starting with 101. Appendices which are additional to those in Part 1 are lettered AA, BB, etc.

There are no special national conditions (snc) causing a deviation from this European Standard, other than those listed in annex ZX of EN 60335-1.

There are no national deviations from this European Standard other than those listed in annex ZY of EN 60335-1.

Other publications quoted in this standard:

EN 60335-2-6 : *Safety of household and similar electrical appliances*
1990
Part 2: Particular requirements for cooking ranges, cooking tables, ovens and similar appliances for household use

IEC 384-14 : *Fixed capacitors for use in electronic equipment*
1981
Part 14: Sectional specification: Fixed capacitors for radio interference suppression — Selection of methods of test and general requirements

NOTE. The following print types are used:

- requirements: in roman type;
- test specifications: in italic type
- explanations: in small roman type.

Foreword to amendment A1

The proposal to endorse amendment 1 : 1995 to IEC 335-2-25 : 1993, document CLC/TC 61 (SEC) 1023, was circulated under the enquiry procedure in June 1995. This proposal was discussed during the Copenhagen meeting in May 1996, when it was decided to submit a draft for an amendment to EN 60335-2-25 to the formal vote.

This draft was circulated in September 1996 and was ratified by CENELEC as amendment A1 on 1997-03-11.

This amendment has been prepared by the secretariat of CENELEC Technical Committee TC 61.

The following dates are applicable:

- latest date of publication of an identical national standard (dop) 1997-09-01
- date of withdrawal of conflicting national standards (dow) 1999-06-01

For products which have complied with EN 60335-2-25 : 1995 before 1999-06-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2004-06-01.

This amendment supplements or modifies the corresponding clauses of EN 60335-2-25 : 1995. There are no special national conditions causing a deviation from this amendment. There are no national deviations from this amendment.

Contents

	Page
Foreword	2
Clause	
1 Scope	4
2 Definitions	4
3 General requirement	6
4 General notes on tests	6
5 Rating	6
6 Classification	6
7 Marking	6
8 Protection against electric shock	8
9 Starting of motor-operated appliances	8
10 Input and current	8
11 Heating	9
12 Operation under overload conditions of appliances with heating elements	11
13 Electrical insulation and leakage current at operating temperature	11
14 Radio and television interference suppression	12
15 Moisture resistance	12
16 Insulation resistance and electric strength	13
17 Overload protection	14
18 Endurance	15
19 Abnormal operation	16
20 Stability and mechanical hazards	19
21 Mechanical strength	20
22 Construction	22
23 Internal wiring	26
24 Components	26
25 Supply connection and external flexible cables and cords	27
26 Terminals for external conductors	27
27 Provision for earthing	27
28 Screws and connections	27
29 Creepage distances, clearances and distances through insulation	27
30 Resistance to heat, fire and tracking	28
31 Resistance to rusting	28
32 Radiation, toxicity and similar hazards	29
Appendices	31

SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES

Part 2: Particular requirements for microwave ovens

1 Scope

This clause of part 1 is applicable, except as follows:

1.1 *Replacement:*

This standard applies to appliances for heating food and beverages using electromagnetic energy (microwaves) in one or more of the I.S.M. frequency bands¹⁾ between 300 MHz and 30 GHz and intended for household use. These appliances may also incorporate a browning or steaming function.

For combination microwave ovens EN 60335-2-6 is also applicable.

This standard does not take into account the special hazards which exist in nurseries and other places where there are young children or aged or infirm persons without supervision; in such cases additional requirements may be necessary.

This standard does not apply to:

- appliances for industrial purposes;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
- appliances for medical purposes.

Until an IEC standard for microwave ovens for commercial purposes is issued, this standard may form a guide to suitable requirements and tests for such appliances.

For appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary.

For appliances intended to be used in tropical countries, special requirements may be necessary.

Attention is drawn to the fact that in many countries additional requirements are specified by the national health authorities and the national authorities responsible for the protection of labour.

2 Definitions

This clause of part 1 is applicable, except as follows:

2.2.6 *Addition:*

Rated frequency refers to input frequency.

¹⁾ I.S.M. frequency bands are the electromagnetic frequencies established by international treaty for industrial, scientific and medical purposes.

2.2.30 Replacement:

normal load denotes that the appliance is operated with a potable water load of initially $(1\,000 \pm 50)$ g in a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm. The load is placed at the centre of the shelf. The initial temperature of the water is (20 ± 2) °C.

Additional definitions:

2.2.101 microwave oven: Appliance designed to use microwave energy for heating food and beverages in a cavity.

Examples of heating are defrosting, warming and cooking.

2.2.102 combination microwave oven: Appliance which combines some or all of the thermal heating functions of conventional ovens with microwave heating in a cavity.

Microwave ovens incorporating a browning function only are not considered to be combination microwave ovens.

2.2.103 cavity: Space enclosed by the inner walls and door and into which food and beverages are placed.

2.2.104 microwave enclosure: Structure intended to effectively confine the microwave energy to a defined region.

Examples are the cavity, door seals and waveguides.

2.2.105 shelf: Horizontal support in the cavity on which the load is placed.

2.2.106 browning function: Process which supplements microwave cooking by means of radiant heating elements.

2.2.107 magnetron: Type of vacuum tube used to generate microwaves.

2.2.108 stirrer: Device which changes the microwave relationship between the load in the cavity and the microwave generator by mechanical, electrical or magnetic means.

Examples of such devices are a rotating shelf, a moving secondary antenna or a metal propeller.

2.2.109 microwave transparency: Property of a material having negligible absorption and reflection of microwaves.

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

2.2.110 Interlock: Safety device or system, which prevents a particular situation unless specified conditions exist.

An example of an interlock is a switch which prevents the operation of the magnetron unless the cavity door is closed.

2.2.111 monitored door interlock: Interlock system which incorporates a supervision device.

2.2.112 temperature sensing probe: Device which is inserted into the food to measure temperature and which is the detachable component of a control incorporated in a microwave oven.

2.2.113 steaming function: Process which supplements microwave cooking by steam which is generated at approximately atmospheric pressure.

2.2.114 rated microwave power output: Microwave power output assigned to the oven by the manufacturer.

3 General requirement

This clause of part 1 is applicable.

4 General notes on tests

This clause of part 1 is applicable, except as follows:

4.2 Addition:

An additional sample may be required for the test of 19.106.

Six samples of the interlock are required for the test of 18.101.

4.3 Replacement:

The tests are carried out in the following order of clauses and subclauses: 32.1, 32.102 to 32.104, 7 to 10, 11 with 32.101, 13 to 17, 20, 21.1 to 21.4, 18, 19 except 19.106, 22 to 31, 21.101 to 21.105 and 19.106.

Additional subclauses:

4.101 Unless otherwise specified, microwave ovens are tested as motor-operated appliances.

4.102 Class III temperature sensing probes are not subjected to the tests, except that of 22.115.

5 Rating

This clause of part 1 is applicable.

6 Classification

This clause of part 1 is applicable.

7 Marking

This clause of part 1 is applicable except as follows:

7.1 Addition:

Appliances shall also be marked with the rated microwave frequency in megahertz. This frequency shall be the centre frequency of the I.S.M. band.

The appliance shall be marked with the substance of the following warning in clearly legible lettering at least 3 mm high. The warning shall be visible when removing any cover if removal of such a cover results in microwave leakage exceeding the value specified in 32.1:

**WARNING
MICROWAVE ENERGY
DO NOT REMOVE THIS COVER**

7.5 Addition:

The rated input of heating elements providing a browning function shall be marked either on each element or on the rating plate.

7.6 Addition:

Add the following to the list of symbols:

MHz megahertz

7.12 Addition:

Instructions for maintenance of the microwave oven shall be included in the instruction sheet. These instructions shall include the method for cleaning door seals and adjacent parts. A warning shall be included stating that if these areas are damaged the oven must not be operated until it has been repaired by a qualified service technician.

The instruction sheet shall warn the user that it is hazardous for anyone, other than a qualified service technician, to carry out any service or repair operation which involves removal of any cover which gives protection against exposure to microwave energy.

The instruction sheet shall warn the user that the contents of feeding bottles and baby food jars are to be stirred or shaken and that the temperature is to be checked before consumption, to avoid burns.

The instruction sheet shall warn the user that liquids or other foods must not be heated in sealed containers since they are liable to explode.

The instruction sheet shall warn the user that eggs in their shell or whole hard-boiled eggs should not be heated in the microwave oven since they may explode.

The instruction sheet shall state the rated microwave power output.

NOTE — Rated microwave power output refers to the level of output that is available on a continuing basis. Measurement of ovens with a boost function is under consideration.

The instruction sheet shall include the substance of the following:

Before use, the user should check that utensils
are suitable for use in microwave ovens.
If smoke is observed, keep the oven door closed,
and switch off or disconnect the oven from the power supply.

The instruction sheet shall advise the user to look at the oven from time to time when food is heated or cooked in disposable containers of plastic, paper or other combustible materials.

Furthermore, instruction sheets for microwave ovens shall warn the user about possible hazards caused by delayed eruptive boiling of liquids.

The instruction sheet shall state the minimum height of the free space necessary above the top surface of the oven.

The instruction sheet for microwave ovens provided with a socket for a temperature sensing probe shall include the substance of the following:

Only use the temperature sensing probe recommended for this microwave oven.

The instruction sheet shall warn the user that the contents of feeding bottles and baby food jars are to be stirred or shaken and that the temperature is to be checked before consumption to avoid burns.

Additional subclause:

7.101 Instructions for servicing shall clearly identify all parts which are liable to be removed when the appliance is serviced and which give access to potentials above 250 V to earth or which may cause undue microwave exposure.

Instructions for servicing shall contain the substance of the following in clearly legible text:

**CAUTION
MICROWAVE RADIATION**

**DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE
GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.**

8 Protection against electric shock

This clause of part 1 is applicable except as follows:

8.1 Addition:

Components connected between the secondary side of an isolating transformer and an earthed chassis are not considered as live at the point of connection to the chassis.



© BSI 1997

Documents
Document Sharing Hub