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# JIS C 9335-2-25 : 2003 (JEMA)

**Household and similar electrical  
appliances—Safety—  
Part 2-25 : Particular requirements  
for microwave ovens, including  
combination microwave ovens**

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ICS 13.120; 29.020; 97.040.20

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## Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee, as the result of proposal for revision of Japanese Industrial Standard submitted by The Japan Electrical Manufacturers' Association (JEMA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS C 9335-2-25 : 1999** is replaced with this Standard.

This revision has been made based on **IEC 60335-2-25 : 2002** *Household and similar electrical appliances—Safety—Part 2-25 : Particular requirements for microwave ovens, including combination microwave ovens* for the purposes of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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# Household and similar electrical appliances—Safety—Part 2-25 : Particular requirements for microwave ovens, including combination microwave ovens

**Introduction** This Japanese Industrial Standard has been prepared based on **IEC 60335-2-25** *Household and similar electrical appliances—Safety—Part 2-25 : Particular requirements for microwave ovens, including combination microwave ovens* published in 2002 as the fifth edition with some modifications of the technical contents and to be read together with **JIS C 9335-1 : 2003** *Household and similar electrical appliances—Safety—Part 1 : General requirements*.

Portions underlined with dots are the matters in which the contents of the original International Standard have been modified. The list of modifications with the explanations is given in Annex 1 (informative).

**1 Scope** This Standard deals with the safety of microwave ovens for household use, their rated voltage being not more than 250 V.

This Standard also deals with combination microwave ovens, for which Annex AA is applicable.

As far as is practicable, this Standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general it does not take into account

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

**NOTES 101** Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- in many countries, additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the water work authorities and similar authorities.

**102** This Standard does not apply to

- commercial microwave ovens (**JIS C 9335-2-90**)
- industrial microwave heating equipment (**IEC 60519-6**)
- appliances for medical purposes (**IEC 60601**)
- 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).

**NOTE :** The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

IEC 60335-2-25 : 2002 *Household and similar electrical appliances—Safety—Part 2-25 : Particular requirements for microwave ovens, including combination microwave ovens* (MOD)

**2 Normative references** The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS C 9335-2-6 *Safety of household and similar electrical appliances—Part 2 : Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances*

NOTE : **IEC 60335-2-6** : 1997 *Safety of household and similar electrical appliances—Part 2 : Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances* is equivalent to the said standard.

JIS C 9335-2-9 *Safety of household and similar electrical appliances—Part 2 : Particular requirements for toasters, grills, roasters and similar appliances*

NOTE : **IEC 60335-2-9** : 1993 *Household and similar electrical appliances—Safety—Part 2-9 : Particular requirements for toasters, grills, roasters and similar appliances* and Amendment 1 (1998) are equivalent to the said standard.

**3 Definitions** Clause 3 of **JIS C 9335-1** is applicable except as follows. The terms in 3.1.7 and 3.1.9 are redefined in this Standard.

**3.1.7** 3.1.7 of **JIS C 9335-1** is applicable except as follows.

NOTE 101 The rated frequency is the input frequency.

### **3.1.9 normal operation**

3.1.9 of **JIS C 9335-1** is replaced with the following;

operation of the appliance with  $1\,000\text{ g} \pm 50\text{ g}$  of potable water at an initial temperature of  $20\text{ °C} \pm 2\text{ °C}$  in a cylindrical borosilicate glass vessel having a maximum thickness of 3 mm and an outside diameter of approximately 190 mm. The vessel is placed on the centre of the shelf.

### **3.101 microwave oven**

appliance using 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

### **3.102 combination microwave oven**

microwave oven in which heat is also provided in the cavity by simultaneous or consecutive operation of resistive heating elements

NOTE : The resistive heating elements are used to provide radiant heat, convection heat or steam.

**3.103 cavity**

space enclosed by the inner walls and the door in which the load is placed

**3.104 shelf**

horizontal support in the cavity on which the load is placed

**3.105 door interlock**

device or system that prevents the operation of the magnetron, unless the oven door is closed

**3.106 monitored door interlock**

door interlock system that incorporates a supervision device

**3.107 temperature-sensing probe**

device that is inserted into the food to measure its temperature and is a part of an oven control

**4 General requirement** Clause 4 of JIS C 9335-1 is applicable.

**5 General conditions for the tests** Clause 5 of JIS C 9335-1 is applicable except as follows. 5.2 and 5.3 are modified in this Standard.

**5.2** 5.2 of JIS C 9335-1 is applicable except as follows.

NOTE 101 An additional sample may be required for the test of 19.104.

NOTE 102 Six samples of the interlocks are required for the test of 24.1.4.

**5.3** 5.3 of JIS C 9335-1 is modified as follows.

Instead of carrying out the tests in the order of clauses, the following sequence of clauses and subclauses applies: 32, 22.113, 22.108, 22.115, 7 to 17, 20, 21 (except 21.101 to 21.105), 18, 19 (except 19.104), 22 (except 22.108, 22.113 and 22.115), 23 to 31, 21.101 to 21.105 and 19.104.

**5.101** Microwave ovens are tested as motor-operated appliances.

**5.102** Class III temperature-sensing probes are only subjected to the tests of 22.112.

**6 Classification** Clause 6 of JIS C 9335-1 is applicable except as follows. 6.1 is respecified in this Standard.

**6.1** 6.1 of JIS C 9335-1 is applicable except as follows.

Microwave ovens shall be class 0I, class I or class II.

**7 Marking and instructions** Clause 7 of JIS C 9335-1 is applicable except as follows. 7.1, 7.12 and 7.14 are respecified in this Standard.

**7.1** 7.1 of **JIS C 9335-1** is applicable except as follows.

Appliances shall be marked with the nominal frequency in megahertz of the ISM band in which they operate.

If the removal of any cover results in microwave leakage exceeding the value specified in clause **32**, the cover shall be marked with the substance of the following:

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

If an appliance incorporates a socket-outlet protected by means of fuses, other than D-type fuses, it shall be marked with the rated current of the relevant fuse. When a miniature fuse-link is provided, this marking shall indicate that the fuse-link is to have a high breaking capacity.

**7.12** 7.12 of **JIS C 9335-1** is applicable except as follows.

The instructions shall state the substance of the following:

**IMPORTANT SAFETY INSTRUCTIONS  
READ CAREFULLY AND KEEP FOR FUTURE REFERENCE**

The instructions for use shall include the substance of the following:

- **WARNING:** If the door or door seals are damaged, the oven must not be operated until it has been repaired by a competent person;
- **WARNING:** It is hazardous for anyone other than a competent person to carry out any service or repair operation that involves the removal of a cover which gives protection against exposure to microwave energy;
- **WARNING:** Liquids and other foods must not be heated in sealed containers since they are liable to explode;
- **WARNING:** Only allow children to use the oven without supervision when adequate instructions have been given so that the child is able to use the oven in a safe way and understands the hazards of improper use;
- the minimum height of free space necessary above the top surface of the oven;
- only use utensils that are suitable for use in microwave ovens;
- when heating food in plastic or paper containers, keep an eye on the oven due to the possibility of ignition;
- if smoke is observed, switch off or unplug the appliance and keep the door closed in order to stifle any flames;
- microwave heating of beverages can result in delayed eruptive boiling, therefore care must be taken when handling the container;
- the contents of feeding bottles and baby food jars shall be stirred or shaken and the temperature checked before consumption, in order to avoid burns;
- eggs in their shell and whole hard-boiled eggs should not be heated in microwave ovens since they may explode, even after microwave heating has ended;

- details for cleaning door seals, cavities and adjacent parts;
- the oven should be cleaned regularly and any food deposits removed;
- failure to maintain the oven in a clean condition could lead to deterioration of the surface that could adversely affect the life of the appliance and possibly result in a hazardous situation;
- only use the temperature probe recommended for this oven (for appliances having a facility to use a temperature-sensing probe).

**7.14** 7.14 of JIS C 9335-1 is applicable except as follows.

The height of the lettering of the warning specified in 7.1 shall be at least 3 mm. Compliance is checked by measurement.

**8 Protection against access to live parts** Clause 8 of JIS C 9335-1 is applicable except as follows. 8.1.1 and 8.2 are additionally specified in this Standard.

**8.1.1** 8.1.1 of JIS C 9335-1 is applicable except as follows.

Test probe 18 of JIS C 0922 is also applied, as specified for test probe B. However, it is only applied to parts that are accessible when the oven is operated in normal use.

**8.2** 8.2 of JIS C 9335-1 is applicable except as follows.

Test probe 18 of JIS C 0922 is also applied, as specified for test probe B. However, it is only applied to parts that are accessible when the oven is operated in normal use.

**9 Starting of motor-operated appliances** Clause 9 of JIS C 9335-1 is not applicable.

**10 Power input and current** Clause 10 of JIS C 9335-1 is applicable.

**11 Heating** Clause 11 of JIS C 9335-1 is applicable except as follows. 11.2, 11.7 and 11.8 are respecified in this Standard.

**11.2** 11.2 of JIS C 9335-1 is applicable except as follows.

Stationary type appliances, other than built-in appliances, are positioned in compliance with the condition as specified in JIS C 9335-2-6 and the portable type appliances are in compliance with the condition in JIS C 9335-2-9.

A ceiling is placed over the appliance at the minimum height stated in the instructions. The ceiling has a depth of 300 mm from the back wall of the test corner and a length at least 150 mm in excess of the width of the appliance.

**11.7** The specification in 11.7 of JIS C 9335-1 is replaced with the following:

Appliances are operated for three cycles, each cycle consisting of a heating period of 10 min followed by a rest period of 1 min. During the rest periods, the door is open and the load is replaced.

**11.8** 11.8 of **JIS C 9335-1** is applicable except as follows.

The temperature rises of external surfaces of microwave ovens are only measured on the surfaces that are not placed against the wall and the floor of the test corner.

There are no temperature rise limits for air-outlet grilles and for surfaces up to a distance of 25 mm from them.

NOTE 101 These surfaces do not include handles.

**12** (Not specified.)

**13 Leakage current and electric strength at operating temperature** Clause 13 of **JIS C 9335-1** is applicable.

**14 Transient overvoltages** Clause 14 of **JIS C 9335-1** is applicable.

**15 Moisture resistance** Clause 15 of **JIS C 9335-1** is applicable except as follows. 15.2 is additionally specified in this Standard.

**15.2** 15.2 of **JIS C 9335-1** is applicable except as follows.

A quantity of 0.5 L of water containing approximately 1 % NaCl is poured steadily over the shelf over a period of 1 min. If the shelf can collect spilled liquid, it is filled with the saline solution and a further 0.5 L is then added over a period of 1 min.

**15.101** Temperature-sensing probes shall be constructed so that their insulation is not affected by water.

Compliance is checked by the following test.

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 water is heated to the boiling point in approximately 15 min. The probe is then removed from the boiling water and immersed in water 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 water. All traces of liquid are then removed from the surface.

The probe shall then withstand the leakage current test of **16.2**.

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

**16 Leakage current and electric strength** Clause 16 of **JIS C 9335-1** is applicable except as follows.

**16.101** The windings of the power transformer that supplies the magnetron shall have adequate insulation.

Compliance is checked by the test of **16.101.1** for switch-mode power supplies and by the test of **16.101.2** for other power transformers.