

JIS

JAPANESE INDUSTRIAL STANDARD

Electric ovens

JIS C 9206—1994

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Electric ovens

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1. **Scope** This Japanese Industrial Standard specifies electric ovens for domestic use with a rated power consumption not exceeding 2 kW (hereafter referred to as "ovens"). Fish roasters, oven toasters are excluded.

Remarks: 1. The following standards are cited in this Standard:

- JIS A 9505 Thermal insulation material made of glass wool
- JIS C 0602 General rules of colour identification for protective conductor and neutral conductor and terminal marking for apparatus
- JIS C 2520 Wires and rolled wires for electrical heating
- JIS C 3301 Rubber insulated flexible cords
- JIS C 8303 Plugs and receptacles for domestic and similar general use
- JIS C 8304 Small switches for indoor use
- JIS C 8358 Appliance couplers for domestic and similar use
- JIS K 2240 Liquefied petroleum gases
- JIS K 5400 Testing methods for paints
- JIS K 7202 Method of Rockwell hardness test for plastics
- JIS S 6006 Pencils and coloured pencils

2. The units and numerical values in { } in this Standard are based on traditional units and are appended for informative reference.

2. **Definitions** For the purpose of this Standard, the following principal definitions apply:

- (1) **electric oven** An apparatus which heats and cooks foods by utilizing electric heat in the form of convection heat and radiation heat.
- (2) **time switch** A switch on which the time is set by the user at use and which cuts off the current to the heating element when the set time is elapsed.
- (3) **rack** A netting on which food to be cooked is placed.
- (4) **tray** A pan on which food to be cooked is placed.

3. **Rated voltage and rated frequency** The rated voltage shall be a single-phase a.c. voltage not exceeding 300 V, and the rated frequency shall be 50 Hz, 60 Hz or 50 Hz/60Hz in common.

4. Performances

4.1 Starting When an oven with a motor is tested as specified in 7.2, the motor shall start irrespective of the position of rotor.

4.2 Voltage fluctuation When the test of 7.3 is carried out, the voltage fluctuation shall cause no trouble to practical service.

4.3 Power consumption When the test of 7.4 is carried out, the power consumption shall fall within the value from the rated power consumption specified in Table 1.

Table 1. Tolerance on power consumption

Rated power consumption W	Tolerance %
Up to and incl. 1000	± 10
Over 1000 up to and incl. 2000	+ 5 -10

4.4 Insulation

4.4.1 Insulation resistance When the test of 7.5.1 is carried out, the insulation resistance shall be not less than 1 M Ω .

4.4.2 Dielectric withstand voltage When the dielectric withstand voltage test is carried out as specified in 7.5.2, the specimen shall withstand the test voltage.

4.4.3 Leakage current when the test of 7.5.3 is carried out, the leakage current shall not exceed 1 mA.

4.5 Temperature

4.5.1 Normal temperature When the normal temperature test is carried out as specified in 7.6.1, the temperature at each part shall not exceed the value specified in Table 2.

Table 2. Temperature of each part

Unit: °C

Point of measurement		Temperature	
Winding	of Class A insulation	100	
	of Class E insulation	115	
	of Class B insulation	125 (120)	
	of Class F insulation	150 (140)	
	of Class H insulation	170 (165)	
Handle for carriage (excluding the one operated by a man while current is flowing)	Made of metal, ceramics and glass	65	
	Made of others	80	
Knob and push button of switch	Made of metal, ceramics and glass	60	
	Made of others	75	
Handle to be operated during service	Made of metal, ceramics and glass	55	
	Made of others	70	
Surface of wooden base on which specimen is placed ⁽¹⁾		95	
Rectifier		Made of silicon 135	
Surface of cord and of each layer of wire in cord reel mechanism	Natural rubber mixture	60	
	Styrene-butadiene rubber mixture and chloroprene rubber mixture	75	
	Ethylene-propylene rubber mixture	80	
	Silicone rubber mixture and chloro-sulfonite polyethylene rubber mixture	90	
Enclosure ⁽²⁾	Easily accessible by a man	Made of metal, ceramics and glass	85
		Made of others	100
	Not easily accessible by a man		100

Notes ⁽¹⁾ For built-in type, this means the place comes in contact when it is built-in.⁽²⁾ For ovens whose volume exceeds 30000 cm³ only. However, periphery of outlet through which the heat in chamber is exhausted is excluded.

Remarks 1. The reference ambient temperature is 30°C.

2. The numerical values in parentheses are applicable to motor winding.

4.5.2 Abnormal temperature When the abnormal temperature test is carried out as specified in 7.6.2 the oven or the wooden base shall not burn, and the insulation resistance between live parts and surface of appliance body measured with a d.c. 500 V insulation tester two minutes after completion of the test shall be not less than 0.1 MΩ.

4.6 Performances of thermostat and self-resetting temperature limiter When the tests are carried out in accordance with the method of 7.7, the performances shall comply with the following requirements:

- (1) **Make and break performance** There shall be no abnormalities at any part.
- (2) **Operating temperature test** The test results shall comply with Table 3.

Table 3. Permissible range of operating temperature

Classification		Permissible range
Before make and break test	Thermostat	The average value of the average of temperatures at the instant when the circuit opens and the average of temperatures at the instant when the circuit closes, shall be within $\pm 5^{\circ}\text{C}$ from the set temperature for ovens with a temperature setting less than 100°C , within $\pm 5\%$ for ovens with a temperature setting from 100°C (incl.) to 200°C (incl.), and within $\pm 10^{\circ}\text{C}$ for ovens with a temperature setting exceeding 200°C .
	Self-resetting temperature limiter	The average value of the temperatures at the instant when the circuit opens shall be within $\pm 15^{\circ}\text{C}$ from the set temperature.
After make and break test	Thermostat	The average value of the average of temperatures at the instant when the circuit opens and the average of temperatures at the instant when the circuit closes, shall be within $\pm 5^{\circ}\text{C}$ from the measured value before the make and break test for ovens with a temperature setting less than 100°C and within $\pm 5\%$ for ovens with a temperature setting 100°C or over.
	Self-resetting temperature limiter	The average value of temperatures at the instant when the circuit opens shall be within $\pm 5^{\circ}\text{C}$ from the value before make and break test for ovens with a temperature setting less than 100°C and within $\pm 5\%$ for ovens with a temperature setting 100°C or over.

4.7 Performance of manually resetting temperature limiter When the tests are carried out in accordance with the method of 7.8, the performance shall comply with the following requirements:

- (1) Make and break performance There shall be no abnormalities at any part.
- (2) Operating temperature test The test results shall comply with Table 4.

Table 4. Permissible range of operating temperature

Classification	Permissible range
Before make and break test	The average value of temperatures at the instant when the circuit opens shall be within $\pm 15^{\circ}\text{C}$ from the set temperature.
After make and break test	The average value of temperatures at the instant when the circuit opens shall be within $\pm 5^{\circ}\text{C}$ from the value before make and break test for ovens with a temperature setting less than 100°C , and within $\pm 5\%$ for ovens with a temperature setting 100°C or over.

4.8 Time switch When a time switch is tested as specified in 7.9, the switch shall be free from short circuit, welding of contacts and other electrical and mechanical troubles.

After the test of 7.9, a current equal to the rated current is passed while the contacts are closed until the temperature rise of contacts is almost stabilized. The temperature rise so obtained shall not exceed 40°C for contacts of copper or copper alloy, or 65°C for contacts of silver or silver alloy.

The object of this test is time switches of mechanical system, and this test is not carried out on those of electronic system.

4.9 Practical performances

4.9.1 Baking performance When the baking performance test is carried out as specified in 7.10(1), the cookies shall be free from remarkable scorch and unevenness on their surface, and half-baked part in their inside.

4.9.2 Temperature rise performance of cabinet inside When an oven is tested for its temperature rise performance inside its cabinet as specified in 7.10(2), the time necessary for the temperature at the center of cabinet to reach 200°C shall be within 20 min, and the highest temperature shall be not less than 220°C .

4.9.3 Temperature distribution When the temperature distribution test is carried out as specified in 7.10(3), the difference in temperature between the center measurement point and each of other six measurement points shall be within 20°C .

4.9.4 Gurantee of temperature inside chamber When the test of 7.10(2) is carried out, the temperature at center of cabinet shall fall within $\pm 10\%$ from the highest temperature on the temperature scale.

4.10 Endurance of electric heating wire (ribbon) When an electric heating wire (ribbon) is tested as specified in 7.11, the wire (ribbon) shall not break.

4.11 Endurance of door opening and closing mechanism The door opening and closing mechanism shall not show any abnormality when tested in accordance with 7.12.

4.12 Flexure of cord joint The flexure of cord joint shall be as follows:

- (1) When an oven with a cord directly attached to the appliance body is tested in accordance with 7.13.1, the rate of broken component wires shall not exceed 20% and no short circuit shall occur.
- (2) When the cord joint of non-rewirable attachment plug with cord is tested in accordance with 7.13.2, the rate of broken component wires shall not exceed 20% and no short circuit shall occur.

4.13 Resistance to shock by fall Immediately after the test of 7.14, the resistance to shock by fall shall satisfy the requirements stated below. However, this test is not carried out on an oven exceeding 4 kg in mass.

- (1) No live part shall be exposed. However, exposure of live parts in such a degree that the live parts are not touched by the test finger shown in Attached Fig. 1 is an exception.
- (2) No short circuit shall occur when the appliance is connected to the power supply.
- (3) The insulation resistance between the live parts and the surface of appliance body measured with a d.c. 500 V insulation resistance tester shall be not less than 0.1 M Ω .

4.14 Resistance to thermal shock of inspection window When an oven employing glass for its inspection window is subjected to the test of 7.15, the glass shall not break or fall down.

5. Construction

5.1 Construction in general The construction shall comply with the following requirements:

- (1) The oven shall be so constructed that there are no risks of hazards under normal service conditions, the shape is correct, assembling is done well, and the operation is smooth.

- (2) Ovens shall not overturn when inclined at an angle of 10 degrees to horizontal, in any direction.
- (3) Ovens with a rated voltage exceeding 150 V shall be equipped with an earthing terminal or earthing wire.
- (4) The earthing terminal shall comply with the following in addition to compliance with the provision of JIS C 0602.
 - (a) The earthing terminal shall ensure easy and firm mounting of the earthing wire.
 - (b) The nominal diameter of earthing terminal screw shall be not less than 4 mm (not less than 3.5 mm for pressure clamping type).
 - (c) A marking expressing earthing use shall be attached on the earthing terminal or in its vicinity.
- (5) The earthing wire shall be one of the wires stated below in addition to compliance with the provision of JIS C 0602.
 - (a) An annealed copper wire with 1.6 mm diameter or a less corrosive metal wire at least equivalent in strength and thickness.
 - (b) A single-core cord or cabtyre cable with nominal sectional area 1.25 mm² or more.
 - (c) A two-core cord with nominal sectional area 0.75 mm² or more both ends of conductor are twisted and brazed or crimped.
 - (d) One core in a multi-core cord (excluding twisted cord) or cabtyre cable with nominal sectional area 0.75 mm² or more.
- (6) The part of metal cover or box to which the arc is liable to reach when the switch is opened or closed shall be lined with an arc resistant insulating material.
- (7) Moisture proof treatment shall be carried out on the part which is liable to cause such danger as burning of components and exposure of live parts due to moisture absorption.
- (8) The oven shall be equipped with a thermostat (excluding the one which serves as a temperature limiter).
- (9) In an oven with a temperature limiter (including thermal fuse), the limiter shall not operate under normal service conditions.

- (10) Appliances with synthetic resin enclosure (excluding the one requiring translucency, transparency, flexibility or mechanical strength for its functions) shall not burn when tested in such a way that a square plane of 9 cm² or more of the outside surface of enclosure (a specimen cut into a square with one side length of 3 cm leaving the original thickness as it is, if there is no square plane of 9 cm² or more on the enclosure) is inclined by about 45 degrees to the horizontal, the tip of flame about 20 mm long produced by burning LP gas of class 1 and No. 1 specified in JIS K 2240 or a gas at least the equivalent, using a gas burner having a nozzle of inside diameter 0.5 mm with the air inlet closed, is applied to the central part of the above surface from the bottom vertically for 5 s and then removed.
- (11) The enclosure shall not cause fissures, cracks, or other abnormalities which result in such danger as electrical shock and fire when a weight 250 g in mass, having a spherical surface of 10 mm radius finished with polyamide to have Rockwell hardness HRR 100 specified in JIS K 7202 is dropped vertically from the height of 20 cm once, or when an impact force of $0.5 \pm 0.05 \text{ N} \cdot \text{m}$ ($0.05 \pm 0.005 \text{ kgf} \cdot \text{m}$) is applied with the impact testing apparatus given in Attached Fig. 2, once. However, the indicator lamp, fuse holder, inspection window or the like exposed on the outside of the body and their protective covers, each of which has a surface area not exceeding 4 cm², and does not project by 10 mm or more from the outer surface of the body, are excluded.
- (12) An appliance which produces steam from its inside shall be so constructed that the water drops produced from the steam will not splash on the switch, connector, cord, etc. attached to the appliance body under normal service conditions. If the said parts have waterproof construction or will not cause hazards like electrical shock and fire, such a case is an exception.
- (13) In an appliance in which a part of body is attached or detached, the operation of attaching or detaching the part shall be capable of being made easily and surely.
- (14) The knobs of switch can not be removed by a force of 30 N (3 kgf). If there is no possibility of mal-connection at mounting of the apparatus, such a case is an exception.
- (15) When a connector is used to connect the appliance body with the cord, the connecting operation shall be capable of being made surely and safely.
- (16) The strength of noise generated shall comply with the following requirements:
- (16.1) The noise power shall be not more than 55 dB in a frequency range of 30 MHz or over up to and including 300 MHz when measured with absorbing clamp. In this case, the dB means the value calculated based on 1 pW is 0 dB.
- (16.2) The noise terminal voltage measured between one line and the earth shall comply with the following requirements: