

JIS

JAPANESE INDUSTRIAL STANDARD

**Gas burning cooking appliances
for domestic use**

Ⓔ **JIS S 2103**—1991

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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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Gas burning cooking appliances for domestic use S 2103-1991

1. Scope

This Japanese Industrial Standard specifies cooking appliances (hereafter referred to as "appliance") mainly for domestic use using liquefied petroleum gas or city gas⁽¹⁾ (hereafter referred to as "gas") as the fuel, which are given in Table 1.

Note (1) The liquefied petroleum gas means the gas described in the "Standard for liquefied petroleum gas" of enforcement regulations (1969, Ordinance of Ministry of International Trade and Industry No. 14) based on the Law Concerning the Security of Safety and Optimization of Transaction of Liquefied Petroleum, Gas (1967, Law No. 149).
The city gas means the gas of gas group described in the ministerial ordinance (1971, Ordinance of Ministry of International Trade and Industry No. 27) concerning the verification of products for gas based on the Gas Utility Industry Law (1954, Law No. 51).

Table 1. Appliances

Classification	Marked gas consumption ⁽²⁾			Function and the like	(Informative reference)
	kW MJ/h	Liquefied petroleum gas {kg/h}	City gas {kcal/h}		
Gas cooking burner (except portable cooking burner) (hereafter referred to as burner.)	13.9 50.2 max.	{1.0} max.	{12000} max.	The appliance to cook by holding a pan and the like on burner.	Informative Reference Figs. 1 to 7
[Per one unit of burner ⁽³⁾]	(5.81) (20.9) max.	(0.42) max.	(5000) max.		
Gas grill (hereafter referred to as grill.)	6.98 25.1 max.	{0.5} max.	{6000} max.	The appliance to grill or broil foods with direct fire mainly.	Informative Reference Figs. 8 to 12
Gas oven (hereafter referred to as oven.)	6.98 25.1 max.	{0.5} max.	{6000} max.	The appliance to cook foods with radiated heat, and convection heat not by to direct fire.	Informative Reference Figs. 13 to 15
Gas rice cooker [The maximum rice cooking capacity ⁽⁴⁾ 4 l max.] (hereafter referred to as rice cooker.)	4.64 16.7 max.	{0.33} max.	{4000} max.	The appliance provided with an apparatus to extinguish main burner automatically by detecting cooking of rice completed.	Informative Reference Figs. 16 to 19

Table 1 (Continued)

Classification	Marked gas consumption(²)			Function and the like	(Informative reference)
	kW MJ/h	Liquefied petroleum gas {kg/h}	City gas {kcal/h}		
Cooking burner with gas grill (hereafter referred to as burner with grill.)	13.9 50.2 max.	{1.0} max.	{12000} max.	To be provided with the grill.	Informative Reference Figs. 20 to 24
Gas range (hereafter referred to as range)	20.9 75.3 max.	{1.5} max.	{18000} max.	The appliance combined with oven and burner.	Informative Reference Figs. 25 to 28
Others.	The sum of marked gas consumption of combined appliances of not more than 20.9 kW, 75.3 MJ/h {1.5 kg/h 18000 kcal/h}			The appliance combined with any two or more of cooking burner, grill, oven, or rice cooker.	
Gas cooking table (hereafter referred to as cooking table.)	6.98 25.1 max.	{0.5} max.	{6000} max.	The dining table provided with appliances such as cooking burner, grill, etc.	Informative Reference Fig. 29

Complex type

- Notes (2) The marked gas consumption means the gas volume to be consumed by the appliance when used under the condition where the gas consumption is maximum, of which value is marked on the appliance.
- (3) The burner means a burner having the purpose to heat a substance needs to be heated (for example a "pan").
- (4) The maximum rice cooking capacity means the maximum quantity (/) of rice that can be cooked at one time with a rice cooker, of which value is marked on the appliance or others.

Remarks 1. Applicable Standards to this Standard are the following:

- JIS A 9505 Thermal Insulation Material Made of Glass Wool
- JIS C 9212 Electric Rice-Cookers and Electric Rice-Warmers
- JIS S 2010 Aluminium Sheet Wares
- JIS S 2092 General constructions of gas burning appliances for domestic use
- JIS S 2093 Test methods of gas burning appliances for domestic use

2. In this Standard the units and numerical values shown in { } are in accordance with the traditional units and are Standard values.

Further, on and after 1st January, 1995 these are to be in accordance with the International System of Units (SI) and the traditional units and numerical values are to be for informative reference.

3. In this Standard the marked gas consumption are described in four kinds units and numerical values, but for each kind substantially these are equal values.
4. The pressure in this Standard are all gauge pressure unless otherwise indicated as atmospheric pressure.

2. Classification

2.1 Classification according to setting profile of appliances The classification according to setting profile of appliances shall be in accordance with Table 4 of JIS S 2092.

2.2 Classification by kind

2.2.1 Cooking burners Cooking burners shall be classified according to number of burners as given in Table 2.

Table 2. Classification of cooking burners by number of burners

Number of burners	Classification	(Informative reference)
One unit	That of burner is one.	Informative reference Figs. 1 to 7
Two or more units	That of burner two or more.	

2.2.2 Rice cookers Rice cookers shall be classified according to thermal insulation system as given in Table 3.

Table 3. Classification of rice cookers by hot insulation system

Hot insulating system	Classification	(Informative reference)
Hot insulating burner system	The system having hot insulating function by hot insulating burner.	Informative reference Figs. 16, 18
Electronic rice warmer system	The system having thermal insulation function by electronic rice warmer.	Informative reference Fig. 19

Note (5) Electronic rice warmers shall be as specified in JIS C 9212.

3. Performance

The appliance, when tested according to JIS S 2093 and 5., shall satisfy the performance of Table 4.

Further, the complex type and that of combined use of two or more functions, shall satisfy respective functions.

Table 4. Performance and

Item	Performance	JIS S 2093	
Gastightness of gas passage	Leak quantity through device plug is 0.07 l/h max.	Table 6	
	Leak quantity through gas choking valve other than device plug is 0.55 l/h max.		
	There is no leak to outside from gas connecting opening to ports.		
Gas consumption	The accuracy of total gas consumption against the marked gas consumption is $\pm 10\%$	Table 5	
	The accuracy of individual burner against marking is $\pm 10\%$ of the value marked on instructions		
	The ratio of total gas consumption against the total sum of gas consumption of individual burner is 80 % min.	Table 5	Measure burner total accor where



nce and test methods

Test method	Applicable machine type						
	Cooking burner	Grill	Oven	Rice cooker	Cooking table	Cooking burner with grill	Range
Test method specified in this Standard							
	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐
Measure respectively the gas consumption of individual burner capable of being used at the same time and the total gas sumption used at the same time and calculate according to the following formula. $r = \frac{Q}{\Sigma Q_i} \times 100$ where, r : ratio of total gas consumption to total sum of gas consumption of respective burner (%) Q : total gas consumption (kW, MJ/h {kg/h, kcal/h}) ΣQ_i : total sum of gas consumption of individual burners (kW, MJ/h, {kg/h, kcal/h})	☐					☐	☐

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Table 4. (C

Item	Performance	JIS S 2093	
Combustion condition	Still air condition	Table 7	(1) R co "1
	Flames are established securely and there is no explosive ignition.		(2) C
	To be free from lifting.		(a)
	To be free from flame failure.		Sampl
	Flame is to be uniform.		Pan
	To be free from back fire.		(b)
	Continuous noise is not more than 60 dB.		
	There is no explosive sound when burner extinguished.		
	The CO concentration (vol %) in theoretical dry combustion gas (hereafter referred to as CO %) is 0.14 % max.		
	To be free from generation of soot.		
Using condition of excessively large pan (Applies to burner part)	The yellow flame does not contact always to electrode part.		Use a p pan in placed make th burner by view
	To be free from flame failure and back fire of pilot burner.		

4. (Continued)

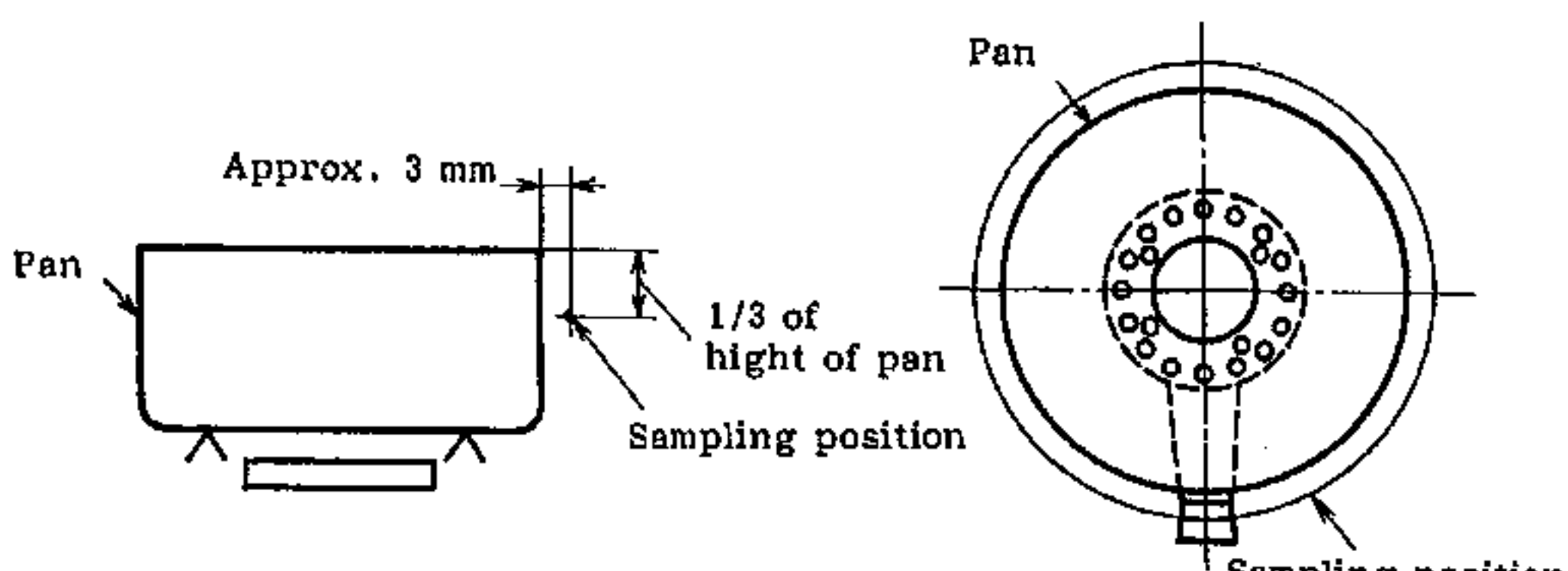
Test method	Applicable machine type						
	Cooking burner	Grill	Oven	Rice cooker	Cooking table	Cooking burner with grill	Range
Test method specified in this Standard							
(1) Relating to flame establishment, for that of gas consumption adjusting type, examine only on "large". (2) Combustion gas sampling method (a) At the burner part, collect uniformly over the total circumference of sampling position of the following Figure. Sampling position of combustion gas of burner part  (b) For grill, oven, and rice cooker, collect uniformly by using the infundibular hood, sampler or the like suitably for respective exhaust openings.	○	○	○	○	○	○	○
Use a pan larger by 60 ± 10 mm in diameter than the test pan indicated in Table 5 (in case where it can not be placed on, the maximum pan capable of being placed-on), make the test gas conditions B-1 or 1-1, ignite each burner, make the device plug fully open and examine by viewing with eyes or the like.	○				○	○	○

Table 4 (Continued)

Item	Performance	JIS S 2093	
(Cont'd)	At the time of opening-closing the oven's door (Applies to oven part)	To be free from flame failure and back fire.	The bu time of be as f (1) St co co th ch ca do vi
		To be free from flame failure and back fire of pilot burner.	(2) St co bu st si
	At the time of opening-closing of cabinet door (Applies to built-in type burner)	To be free from flame failure and back fire.	Regulat marked it at th opening ignite t carry o at the c
	At the time of working of oven thermostat (Applies to oven part)	To be free from flame failure and back fire.	Relatin workin P-3 or where temper
		Flame establishment is steady and is free from explosive ignition.	Table 7, but make the test gas con- ditions P-3 or 3-3. Relatin of ther and ma approx

(Continued)

Test method	Applicable machine type						
	Cooking burner	Grill	Oven	Rice cooker	Cooking table	Cooking burner with grill	Range
Test method specified in this Standard							
The burner which continues its combustion at the time of opening-closing operation of oven's door is to be as follows: (1) <u>Stability of flame of burner</u> Make the test gas conditions P-3 or 3-3, ignite the burner, under the condition where the gas quantity is so adjusted that the temperature at the middle part of oven chamber is maintained at approximately 150°C, carry out the opening-closing operation of oven door at ordinary speed five times and examine visually. (2) <u>Stability of flame of pilot burner</u> Make the test gas conditions P-2 or 3-2, ignite only the pilot burner, after the combustion condition has become stable or after 5 min, carry out the operation similar to (1) and examine visually.			○				○
Regulate gas volume at the position of "minimum" marked on knob, or if no such marking exists regulate it at the position so as to be 1/3 gas volume of full opening, make the test gas conditions P-3 or 3-3, ignite the burner and after burning for 15 min or more, carry out the opening-closing operation of cabinet door at the ordinary speed five times and examine visually.	○					○	
Relating to oven burner which does not extinguish at working time of thermostat, make the test gas conditions P-3 or 3-3, ignite the burner, and under the condition where the thermostat set at approximately 200°C in temperature, examine visually is working.			○				○
Relating to the burner in which at the time of working of thermostat the flame extinguishes, ignite the burner, and make the condition where the thermostat is set at approximately 200°C is working.							

Table 4 (Continued)

Item		Performance		JIS S 2093	
(Cont'd)	Wind existing condition (Applies to that without flame failure safety device)	To be free from flame failure and back fire.			At the set the +0.2 m 0 Further there i (1) St el P 13 is fo (2) St U in ac vi
		To be free from flame failure and back fire of thermal-insulating burner.			
Temperature rise	Temperature rise at ordinary time (Each part of appliance)	Surface of part to contact with hand at the time of operation (Knobs and the like)	Those made of metal, porcelain and glass 60°C max.	Table 10	(1) As ap in in me th by or Fu to co ar le ta co
			The handle of outer frame and knob of lid (Applies to rice cooker) 75°C max.		
			Others 70°C max.		
		The surface of part being apt to be contacted with hand at the time of operation (except the exhausting part of combustion gas, outer frame of rice cooker lid, etc.) 140°C max.			

4 (Continued)

Test method		Applicable machine type						
		Cooking burner	Grill	Oven	Rice cooker	Cooking table	Cooking burner with grill	Range
93	Test method specified in this Standard							
	At the front surface of electric fan of 30 cm in diameter set the rice cooker at the position of wind velocity of $+0.2$ m/s and to be as follows. Further, within 2 m on the periphery of rice cooker there is no hinderance. (1) <u>Stability of flame of burner</u> Shield the wind from electric fan by screen, make the test conditions P-2 or 3-2, ignite the main burner, and after 15 min or when the change in combustion condition is not confirmed, remove the screen, apply the wind for 1 min, and examine visually. (2) <u>Stability of flame of thermal-insulating burner</u> Under the condition where only the thermal-insulating burner is burning, apply the wind according to the method similar to (1) and examine visually.				○			
	(1) As for the set condition of appliance, set the appliance on the temperature measuring board indicated in attached Figs. 1 to 11 so as the interval between the appliance and the temperature measuring board to be the interval indicated in the following table according to the gist instructed by manufacturer (the gist indicated in instructions or the like). Further, in the case where relating to the interval to the temperature measuring board, the effective countermeasures for fire prevention are executed and the interval instructed by manufacturer is less than the dimension specified in the following table, it is to be in accordance with the instructed conditions.	○	○	○	○	○	○	○

Table 4 (Continued)

Item	Performance	JIS S 2093	
(Cont'd)	Temperature rise at ordinary time (Each part of appliance)	The part having fear for touching of foot (Applies to cooking table) 100°C max.	Table 10
		Surface of dry cell 55°C max.	
		Surface of gas connecting opening (except the screw thread connecting opening) 60°C max.	
	Outer surface of gas passing port in gas choking valve component (including device plug)	Not more than 85°C or the temperature confirmed that it complies with the item of airtightness of gas passage and there is no abnormality in operation according to the heat resistance test.	Table 10 Table 14
	Surface of ignition unit (including the piezoelectric element)	Not more than 85°C or the temperature confirmed that there is no hindrance to use according to the heat resistance test.	

Class

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type
net tBuilt
type

Cook

Note

(Continued)

Test method						Applicable machine type						
						Cooking burner	Grill	Oven	Rice cooker	Cooking table	Cooking burner with grill	Range
Test method specified in this Standard												
Interval between the appliance and the temperature measuring board												
Unit: mm												
Classification of appliances		Upper part of appliance	Periphery of appliance		Set condition							
			Periphery of body	Periphery of upper body								
Table type	The type of which burner's part is open (one burner, grill)	1000	150	150	Attached Figs. 1, 2							
	The type of which burning part is enclosed (oven, box type grill)	500	45	45	Attached Figs. 1, 3							
	Rice cooker	4 / or less	300	100	Attached Figs. 1, 4							
		4 /	300	150								
		Cooking burner with two or more burners, cooking burner with grill	1000	0	150*	Attached Figs. 5, 6						
Stationary type cabinet type	Range * cabinet type cooking burner	1000	0	150*	Attached Figs. 5, 7							
Built-in type	Cooking burner, range *	1000	0	150*	Attached Figs. 8, 9							
	Oven	0	0	—	Attached Fig. 10							
Cooking table		—	—	—	Attached Fig. 11							
Note * The rear part of upper body is 0.												

Table 4 (Continued)

Item	Performance	JIS S 2093	
(Cont'd)	Outer surface of part of gas passing in device governor component	Not more than 70°C or the temperature confirmed that it complies with the item of airtightness of gas passage and the change of regulated pressure is not more than $(0.05 P_1 + 29.4)$ Pa $\{(0.05 P_1 + 3) \text{ mmH}_2\text{O}\}$ according to the heat resistance test. P_1 : regulated pressure before heat resistance test	
Temperature rise at ordinary time (wooden wall and the like)	Surfaces of wooden walls of rear surface, side surface of appliance and upper ceiling surface as well as surface of wooden stand underneath the appliance (Refer to Attached Figs. 1 to 11)	100°C max.	Table 10 (2) The following (a) M p h R a s (b) R c o a p m (c) R p r

Continued)

Test method	Applicable machine type						
	Cooking burner	Grill	Oven	Rice cooker	Cooking table	Cooking burner with grill	Range
Test method specified in this Standard							
(2) The using condition of appliance is to be as follows.	○	○	○	○	○	○	○
(a) Make the cooking burner where the device plug is so adjusted that the gas consumption becomes 1/2 of marked gas consumption. Further, for that having temperature control apparatus and capable of setting the temperature, set at the maximum temperature.							
(b) For oven with or without thermostat make the condition where the temperature of the middle in oven chamber is kept at 230°C by device plug and the like. However, in case of being in possible to attain 230°C, make the attainable maximum temperature.							
(c) For rice cooker make the condition where water is poured up to nearly the water level of maximum rice cooking quantity.							

Table 4

Item	Performance	JIS S 2093	
(Cont'd)	Counter surface and counter surface contacting with appliance (Applies to cooking table, built-in type. Refer to attached Figs. 8 to 11)		
	Wall surface of venting pipe penetrating part (Applies to built-in type)		

(Continued)

Test method	Applicable machine type						
	Cooking burner	Grill	Oven	Rice cooker	Cooking table	Cooking burner with grill	Range
Test method specified in this Standard							
(d) For the complex type appliance, make the condition corresponding to respective functions and use all usable burners at the same time. However for the cooking burner in combination use with grill make the using condition of cooking burner. (e) For combined use of functions (cooking burner in combined use with grill, rice cooker in combined use with cooker), carry out the test for the respective functions. (f) As for cooking table, in the case of iron plate or porcelain plate, for grill or barbecue carry out the test with adjusting the device plug or the like at the temperature of the middle part of the plate upper surface so as to keep at 250°C. Further, in the case of using as cooking burner, the aforementioned (a) is applied. However, in the case of using iron plate and porcelain plate, for grill or barbecue Mongolian mutton barbecue pan, Takoyaki device, etc. the position of using device plug or the adjusting method shall be referred to the instructions or markings affixed on the appliance if they are described in those. (3) The combustion duration, relating to each part of appliance shall be for 30 min after igniting the butner, and relating to the wooden wall or the like around the appliance it shall be for successively 30 min. However, relating to the main burner of rice cooker, the combustion duration shall be for first half 15 min of respective 30 min. Further, relating to the grill part of complex type appliance, combustion shall be for only 15 min of respective latter half (Refer to following Table).							

Table 4 (Continued)

Item	Performance		JIS S 2093	
(Cont'd)				(4) For 30 min. known measuring delay (discharge test) follow

(Continued)

Test method		Applicable machine type						
		Cooking burner	Grill	Oven	Rice cooker	Cooking table	Cooking burner with grill	Range
Test method specified in this Standard								
(4) For the temperature measuring time, carry out for 30 min respectively. However, relating to the knob of outer frame of rice cooker and grip of lid, measure the temperature at the time point elapsed by 30 min after beginning the test (directly before beginning the temperature rise test of wooden wall and the like) (Refer to following Table). Combustion time and temperature measuring time of appliance								
	Classification	Time						
		Ignition	30 min	60 min				
Combustion duration	Cooking burner grill, oven, etc.	Each part of appliance	Wooden wall and the like					
	Rice cooker							
	Complex type grill							
Temperature measuring time	Cooking burner, grill, oven, rice cooker, etc.							

● (Temperature measuring time point)
Knob of rice cooker and the like

Table 4 (Continued)

Item	Performance	JIS S 2093	
(Cont'd)	Abnormal time temperature rise (Wooden wall and the like)	135°C max.	Table 10
	Surface of wooden walls of appliance's rear surface, side surface, and upper ceiling surface as well as the surface of wooden stand underneath the appliance (Refer to Attached Figs. 1 to 11)		(1)
	Internal and external surfaces of back face of burner's lower part (Applies to cooking table for combined use with the food warmers top surface) (Refer to Attached Fig. 12)		(2) (a)
	Surface of counter and that to contact with appliance (Applies to cooking table, built-in type -Refer to Attached Figs. 8 to 11)		(b)
	The surface of wall adjacent to the place where vent-pipe passes through (Applies to built-in type.)		(c)
			(d)
			(e)
			(3)