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**Portable gas cookers with LPG
cartridge**

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Foreword

This Japanese Industrial Standard has been 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 Japan Gas Appliances Inspection Association (JIA) 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 S 2147:2009** is replaced with this Standard.

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Portable gas cookers with LPG cartridge

Introduction

This Japanese Industrial Standard was established in 1991 and has been revised three times since then. Cooking appliances used with gas cylinders that are built into the appliance as one of its components or as an accessory to it, are largely divided into those comprising a trivet at their top surface so that the food is heated in a pot or the like placed on the trivet, and those without a trivet and comprising instead a net, a griddle, or a rice cooker pot, etc. at their top surface on which the food is directly placed to be boiled or cooked in other ways. In this revision, the latter type of appliances have been newly incorporated into the scope, and their performance and structural criteria added.

No corresponding International Standard has been established at this point.

1 Scope

This Standard specifies the portable cookers (hereafter referred to as the appliance) used with a cylinder filled with liquefied petroleum gas (hereafter referred to as gas) which is built into the appliance either as one of its components or as an accessory to it.

A cylinder as referred to in this Standard is that containing gas which meets the exemption requirements of the High Pressure Gas Safety Act, and either bearing a marking showing compliance with **JIS S 2148** or specified on the marking on an appliance covered by this Standard as a cylinder to be used.

2 Normative references

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

JIS B 1501 *Rolling bearings—Balls*

JIS C 3101 *Hard-drawn copper wires for electrical purposes*

JIS C 3102 *Annealed copper wires for electrical purposes*

JIS G 3314 *Hot-dip aluminium-coated steel sheet and strip*

JIS G 3446 *Stainless steel tubes for machine and structural purposes*

JIS G 3459 *Stainless steel pipes*

JIS G 4303 *Stainless steel bars*

JIS G 4304 *Hot-rolled stainless steel plate, sheet and strip*

JIS G 4305 *Cold-rolled stainless steel plate, sheet and strip*

JIS G 4308 *Stainless steel wire rods*

JIS G 4313 *Cold rolled stainless steel strip for springs*

JIS G 4314 *Stainless steel wires for springs*

- JIS G 5501 *Grey iron castings*
- JIS H 3100 *Copper and copper alloy sheets, plates and strips*
- JIS H 3250 *Copper and copper alloy rods and bars*
- JIS H 3300 *Copper and copper alloy seamless pipes and tubes*
- JIS H 3320 *Copper and copper alloy welded pipes and tubes*
- JIS H 4000 *Aluminium and aluminium alloy sheets, strips and plates*
- JIS H 4040 *Aluminium and aluminium alloy bars and wires*
- JIS H 4080 *Aluminium and aluminium alloy extruded tubes and cold-drawn tubes*
- JIS H 4090 *Aluminium and aluminium alloy welded pipes and tubes*
- JIS H 4100 *Aluminium and aluminium alloy extruded profiles*
- JIS H 5120 *Copper and copper alloy castings*
- JIS H 5121 *Copper alloy continuous castings*
- JIS H 5301 *Zinc alloys die castings*
- JIS H 5302 *Aluminium alloy die castings*
- JIS S 2010 *Aluminium cookwares*
- JIS S 2091 *Gas and kerosene appliances for domestic use, and their accessories—
Glossary*
- JIS S 2148 *Gas cylinders for portable gas cooker*
- JIS S 2149 *Bimetal type thermal switches for gas appliances*
- JIS Z 1522 *Pressure sensitive adhesive cellophane tapes*
- JIS Z 2371 *Methods of salt spray testing*
- JIS Z 8703 *Standard atmospheric conditions for testing*
- JIS Z 8731 *Acoustics—Description and measurement of environmental noise*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS S 2091**, and the following apply.

3.1 portable gas cooker

cooking appliance provided with a trivet on its top surface, on which a cooking container can be placed for boiling food or other cooking operations (see Figure 10)

3.2 griller

appliance comprising a net on which food is cooked either directly by open fire or by radiant heat from a radiant plate heated red hot by burner flame (see Figure 11)

3.3 hot plate cooker

appliance comprising a plate which, by being heated over open fire, mainly provides the conductive heat to cook food (see Figure 12)

3.4 takoyaki (Japanese octopus dumpling) cooker

appliance for making takoyaki mainly with conductive heat from a dedicated plate heated over open fire (see Figure 13)

3.5 oden (Japanese hodgepodge soup) pot

appliance for boiling and cooking food using a dedicated pot placed on its top surface

3.6 rice cooker

rice cooking appliance equipped with a device which automatically extinguishes the main burner upon detecting the completion of rice cooking

3.7 oven

appliance for cooking food using radiant heat and/or convective heat but not over open fire

3.8 water receiver

tray used in a hot plate cooker, takoyaki cooker or other appliances for receiving cooking juice from the food being cooked

3.9 net

metallic mesh provided on a griller on which food can be placed for cooking

3.10 iron plate

plate provided on a hot plate cooker on which food can be placed for cooking (including the plate for takoyaki)

3.11 dedicated pot

container exclusively used for oden pot for putting food, water and the like

3.12 rice cooker pot

container for rice, water and the like used for a rice cooker

3.13 oven tray

tray used in an oven for putting food

3.14 cylinder containing exempted gas

cylinder containing gas which falls under item (i) or item (iii) of Article 4 of Notification No. 139 of Ministry of International Trade and Industry (Related Notification of the Enforcement Order of High Pressure Gas Safety Act) issued in 1997

4 Performance

The appliances, when tested by the methods specified in clause 7, shall satisfy the performance requirements in Table 1.

Table 1 Performance

Item		Requirement	Applicable test subclause
Gastightness of gas passage	Cylinder-appliance joint	There shall be no leakage under the pressure of 0.9 MPa. For appliances equipped with a pressure sensitive safety device designed so that the cylinder coupled with the appliance can be decoupled, there shall be no leakage under any pressure below the safety device activating pressure.	7.4
	From the cylinder-appliance joint to governor high-pressure side	There shall be no leakage under the pressure of 0.9 MPa.	
	From the governor low-pressure side to the appliance valve	There shall be no leakage under normal operation pressure.	
	From appliance valve to flame port		
Pressure resistance of gas passage		There shall be no leakage, or deformation or breakage detrimental to the use of the appliance.	7.5
Combustion	Normal service condition	Ignition shall be secure, and there shall be no explosive ignition ^{a)} . Ignition at all flame ports shall be achieved within 4 s.	7.7.1
		There shall be no flame lifting ^{b)} .	
		There shall be no unintended flame extinction ^{c)} .	
		The flames shall be uniform.	
		There shall be no backfire ^{d)} .	
		Continuous noise shall not exceed 60 dB.	
		There shall be no explosive noise at flame extinction.	
		The theoretical carbon monoxide (CO) concentration in dry combustion gas (vol %) (hereafter referred to as CO %) shall be 0.14 % max.	
		There shall be no generation of soot ^{e)} .	
	The yellow flame shall not be constantly in contact with the electrode part ^{f)} .		
Service condition of oversize pot	There shall be no flickering of flame, fogginess or irritating odour.		7.7.2
At the time of the oven door opening and closing (applicable to oven part whose burner continues to burn during opening/closing of the door)	There shall be no unintended flame extinction or backfire.		7.7.3
	There shall be no unintended flame extinction or backfire of pilot burner.		

Table 1 (continued)

Item		Requirement		Applicable test subclause
Flame-extinction performance		Flames of all the ports shall go out within 4 s after the closing of the appliance valve.		7.8
Temperature rise ^{g)}	During normal use	Surface of dry cell	55 °C max.	7.9.1 or 7.18 (In the case of heat resistance test)
		Surfaces to be touched by hand at operation (knobs etc.)	Metallic parts 60 °C max.	
			Other parts 70 °C max.	
		Surfaces that are possibly touched by hand at operation (excluding knobs etc.)	140 °C max.	
		Surface of gas-passing part of the appliance valve body	Not exceeding 85 °C or the temperature up to which no gas leakage or abnormalities in operation have been confirmed in the heat resistance test ^{h)} .	
		Surface of valves used for gas-passing parts		
		Surface of ignition unit	Not exceeding 85 °C or the temperature up to which conformity to the electric ignition performance requirement has been confirmed and no deformation or discolouration has been observed in the heat resistance test ^{h)} .	
		Surface of gas-passing part of appliance governor	Not exceeding 70 °C or the temperature up to which no gas leakage or change in regulating pressure exceeding 8 % has been confirmed in the heat resistance test.	
	Wooden wall surfaces corresponding to rear and side surfaces of the appliance and wooden base underneath the appliance	100 °C max. for all surfaces		
During use of oversize pot	Wooden wall surfaces corresponding to rear and side surfaces of the appliance and wooden base underneath the appliance	135 °C max. for all surfaces	7.9.2	
Electrical ignition		Ignition shall successfully occur at least 8 out of 10 times, without consecutive non-ignitions. There shall be no explosive ignition ⁱ⁾ .		7.10
Pressure inside the cylinder		It shall not exceed 0.4 MPa.		7.11

Table 1 (continued)

Item		Requirement			Applicable test subclause
Activation performance of safety devices	Pressure sensitive safety device	The device shall activate in the range of 0.4 MPa to 0.6 MPa. If the device is designed to shut off the gas passage upon activation, no change of pressure in the high pressure part after gas shut-off shall cause the gas passage to automatically reopen and resume feeding of gas.			7.12
	Burner safety shut-off device (applicable to appliances equipped with the burner safety shut-off device)	Those designed to close the gas passage automatically at the time of non-ignition or unintended flame extinction.	The valve shall open within 90 s of ignition.	7.13	
			The valve shall close within 60 s of flame extinction.		
			The valve shall close within 60 s of non-ignition.		
Overheat prevention device (applicable to appliances equipped with the overheat prevention device)	The device shall activate before the appliance reaches the temperature specified by the manufacturer, and when the appliance has cooled down to a normal temperature, the gas passage shall not automatically reopen.			7.14	
Repeated use	Appliance valve		12 000 times	There shall be no gas leakage or defects detrimental to the use of the appliance ^{j)} .	7.15 a)
	Electric ignition device		12 000 times	The electric ignition performance requirement shall be satisfied, and there shall be no defects detrimental to the use of the appliance.	7.15 b)
	Appliance governor	At normal pressure (0.2 MPa)	30 000 times	There shall be no gas leakage or change in regulating pressure exceeding 8 %.	7.15 c)
		At high pressure (safety device activating pressure)	1 000 times	There shall be no gas leakage or change in regulating pressure exceeding 8 %.	
	Pressure sensitive safety device		1 000 times	There shall be no gas leakage ^{k)} , and the activation performance requirement of pressure sensitive safety device shall be satisfied.	7.15 d)
	Cylinder-appliance joint		6 000 times	The requirement for gastightness of gas passage shall be satisfied.	7.15 e)

Table 1 (concluded)

Item	Requirement			Applicable test subclause
Repeated use	Burner safety shut-off device (applicable to appliances equipped with the burner safety shut-off device)	1 000 times	There shall be no gas leakage and the activation performance requirement of burner safety shut-off device shall be satisfied.	7.15 f)
	Automatic flame extinguishing device (applicable to rice cookers)	1 000 times	There shall be no gas leakage and the rice cooking performance requirement shall be satisfied.	7.15 g)
	Oven door (applicable to the oven part)	500 times	There shall be no defects detrimental to the use of the appliance.	7.15 h)
Rice cooking performance (applicable to a rice cooker)	The rice cooker pot shall have a sufficient capacity so that when the maximum allowable amount of rice is cooked, the cooked rice does not touch the lid. There shall be no undercooking, noticeably uneven cooking, scorching, soaking of rice, or boiling over.			7.16 a)
Practical performance of appliance	The thermal efficiency shall not be less than 40 %.			7.17

Notes ^{a)} “No explosive ignition” means that the noise generated at ignition does not exceed 85 dB.

^{b)} “No flame lifting” means that, at 15 s after the ignition, the number of flames which depart from the flame port is not more than one-third of the flame ports in each burner corresponding to the nozzle.

^{c)} “No unintended flame extinction” means that, at 15 s after the ignition, there shall be no flame flickering out in each burner corresponding to the nozzle.

^{d)} “No backfire” means that, during 30 min after the ignition, there shall be no flame burning inside the burner and no flame extinction due to a backfire.

^{e)} “No soot generation” means that, during 30 min after the ignition, excluding the moment of ignition, the bottoms of the containers placed on the appliance such as a pot, net, iron plate, dedicated pot, rice cooker pot, oven tray, etc. as well as the surface of the radiation plate are free from soot deposition.

^{f)} “The electrode part shall not be constantly in contact with yellow flame” means that, when the burner is burnt for 15 min with a pot or the like to be used being placed on the appliance, the yellow flame shall not be in contact with the electrode for more than 30 s continuously per minute.

^{g)} The standard ambient temperature during the temperature-rise test shall be 35 °C.

^{h)} “No abnormalities in operation” means that there is no problem in operation of the appliance valve or in opening and closing of the valve.

ⁱ⁾ “There shall be no explosive ignition” means that the noise generated at ignition shall not exceed 85 dB.

^{j)} “Defects detrimental to the use of the appliance” means such defects as where the appliance valve becomes stuck and unrotatable, or broken.

^{k)} “No gas leakage” means that the amount of air leaking through the valve of the safety device does not exceed 0.55 L/h.

5 Construction

5.1 General

The appliance and each part thereof shall be manufactured with consideration for durability to gas leakage, fire accident or the like, shall be of such a construction as withstanding normal transportation, installation and use without breakage or deformation detrimental to the use of the appliance.

- a) The connection of a cylinder to the appliance shall not be achieved other than by moving¹⁾ the cylinder valve in its axial direction.

Note ¹⁾ “To move the cylinder valve in its axis direction” means that the cylinder is moved in the direction as shown in Figure 1.

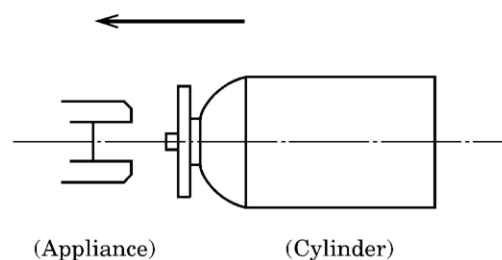


Figure 1 Moving the cylinder valve in its axial direction

- b) A spring shall not be used directly for joining the cylinder to the appliance.
This does not apply to those springs which are used for absorbing a dimensional error.
- c) The appliance shall be structured not to allow placement of a spare cylinder under normal service condition.

An appliance that allows the cylinder to be placed under stationary condition and causes it to drop under raised condition is not considered as satisfying this requirement.

- d) Connecting the cylinder to the appliance shall be possible only when the appliance valve is closed.
- e) The appliance shall be structured so that the cylinder compartment is free from accumulation of gas²⁾.

Note ²⁾ To be “structured so that the cylinder compartment is free from accumulation of gas” means that the appliance is provided with a vent hole in the side or lower face of the cylinder compartment, as well as that the lower face of the cylinder compartment is not in contact with the floor surface.

- f) The appliance shall be provided with an appliance governor.
- g) When tested in accordance with 7.2.4, 7.4 and 7.7, the appliance shall withstand impact and vibration that it may undergo during use or transportation without loss of gastightness and combustion performance, and any other defects detrimental to its use.

“Defects detrimental to the use of the appliance” herein means noticeable deformation or the like.

- h) When tested in accordance with **7.2.3**, the appliance shall not overturn when inclined at an angle within 10° in any direction and positions of the accessory parts shall not change³⁾.

Note ³⁾ “Positions of the accessory parts shall not change” means that no accessory part shall move or be disconnected.

- i) When tested in accordance with **7.2.6**, the appliance shall withstand the loads it may undergo during normal use without any breakage or change detrimental to its use.
- j) For those appliances constructed to release the gas when the cylinder is removed after the appliance valve is closed⁴⁾, when the test specified in **7.2.2** is performed, the inner cubic capacity of the space where the gas accumulates before being released (excluding the part from the appliance valve to the flame port) shall not exceed 1 cm³.

Note ⁴⁾ A construction to “release the gas when the cylinder is removed after the appliance valve is closed” means a construction where the gas passage from the cylinder-appliance joint to the appliance valve is opened to the atmosphere.

- k) Under normal service condition, the gas taken out from the cylinder shall be in gaseous state. However, an appliance having a gasification function shall be exempted from this requirement (but it shall be tested by the method specified in **7.7** to confirm that it is free from abnormal combustion).
- l) When the appliance is tested by the method described in **7.2.7 a)** with the dish and the trivet mounted incorrectly, ignition shall not be possible and the pot or the like shall not be stably supported.
- m) When the appliance is tested by the method described in **7.2.7 b)** with the cylinder shifted from the correct mounting position, the cylinder shall not be successfully mounted in the appliance.
- n) The construction of the appliance shall allow observation of the combustion condition of the burner from the outside.
- o) Ignition of the burner shall be normally possible with the use of a match, ignition rod or other lighting tool.
- p) Edges of the part to be touched by hands during use or cleaning shall be smooth.
- q) Parts that need to be removed for cleaning, repair, etc. shall normally be able to be detached/reattached with a common tool.
- r) The screw threads used for assembling the parts of the appliance shall be capable of fastening the parts securely together. The parts of the appliance that need to be removed for maintenance and checks shall endure repetitive use.
- s) For the gas-passing parts of the appliance, the following shall be satisfied.
- 1) Gas pipes shall be installed at a place free from exposure to excessive heat or from corrosion, or be given protection or other measures that does not impair the function of the appliance.

- 2) Joints shall be connected by welding, screwing-in, with the use of bolts and nuts, screws or the like, and shall be gastight.
 - 3) Appliance valve specified in **5.2** shall be provided.
 - 4) Nozzles shall be as specified in **5.3**.
 - 5) The burner as specified in **5.4** shall be provided.
- t) The burner shall be provided with the trivet specified in **5.6**.
 - u) The burner shall be provided with the drip pan specified in **5.7**, except for appliances for outdoor use such as camping.
 - v) Cylinder attachment to and detachment from the appliance shall be smooth and secure, and shall not cause any abnormalities.
 - w) When a cylinder is mounted in the appliance, there shall be no gas leakage from the joint part.
 - x) The appliance shall be provided with the pressure sensitive safety device as specified in **5.10**.
 - y) Devices used for the appliance shall be as follows.
 - 1) The air adjuster shall be as specified in **5.5**.
 - 2) The electric ignition device shall be as specified in **5.9**.
 - z) Under normal service condition, only the appliance legs shall be in direct contact with the table.
 - aa) The appliance shall not move or overturn easily under normal installation condition.
 - ab) The appliance, except for a rice cooker, shall allow observation of the combustion condition of the burner from the outside. This requirement does not apply to appliances equipped with a device which automatically shuts off the gas passage to the burner when a non-ignition occurs at the time of ignition or in the case of unintended flame extinction (hereafter referred to as burner safety shut-off device).
 - ac) Detachment/attachment of parts of the appliance, excluding the burner, that need to be removed for cleaning, daily maintenance or other purposes shall be normally possible without the use of a tool.
 - ad) The design of the lower burner of the lower burner type appliance and that of the double-sided burner type appliance shall be such that the burner flame is not extinguished by gravy or other cooking juice and such that cleaning of the burner is easy.
 - ae) The rice cooker shall satisfy the following.
 - 1) The rice cooker shall be provided with the burner safety shut-off device.
 - 2) The rice cooker shall be provided with a device which automatically extinguishes the main burner upon detecting the completion of rice cooking (hereafter referred to as automatic shut-off device).

- 3) The automatic shut-off device shall be protected from direct exposure to a boiling overflow or the like and shall not break down easily due to excessive heat or the like.
- 4) The rice cooker pot shall be marked with water levels necessary for cooking rice.
- 5) In the test described in **7.16 b)**, ignition of the burner shall be visually confirmable from the place where the burner ignition operation is performed.

5.2 Appliance valve

The appliance valve shall satisfy the following.

- a) The appliance valve shall be capable of opening/closing the gas passage to the burner smoothly and securely. Those functioning on multiple gas-passages shall be capable of opening/closing each gas passage securely.
- b) For those opening/closing by rotating operations, the rotating direction for opening the gas passage shall normally be counterclockwise.

5.3 Nozzles

The nozzles shall be provided at positions where they are not exposed to dust or foreign matter which may cause clogging, or shall be designed to prevent such clogging.

5.4 Burner

The burner shall satisfy the following.

- a) The pressing-jointed parts, welded parts or other parts shall be free from defects detrimental to the use of the burner.
- b) The flame ports shall be configured with precision, and free from deformation which may affect the combustion.
- c) The burner shall be attached so that its position in relation to other associated parts, for example the nozzle, electric ignition device can be maintained securely and so that, under normal use condition, it does not move or fall out of place.
- d) The burner flame shall not heat or injure any other part than required to be heated.
- e) The burner design shall allow easy cleaning. This does not apply to those burners whose design prevents them from being exposed to boiling overflow and the like.

5.5 Air adjuster

The air adjuster shall satisfy the following.

- a) The air adjuster shall enable easy adjustment of air amount (except for appliances not requiring air adjustment during use), and its setting position shall not be shifted under normal service condition.
- b) The adjuster knob, if provided, shall be located at a position convenient for operation, and its design allows smooth and secure operation.