

JIS

JAPANESE INDUSTRIAL STANDARD

**General Rules for Construction
of Oil Burning Appliances**

JIS S 3030—1989

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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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General Rules for Construction of Oil
Burning Appliances

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1. Scope

This Japanese Industrial Standard specifies general common matters such as burning system, draft system, use division system, construction, working method, etc. of oil burning appliances (hereafter referred to as "appliances") using kerosine, gas oil, or fuel oil as fuel.

Remark: In this Standard the units and numerical values shown in { } are in accordance with traditional units and are appended for informative reference.

2. Division of Using Fuels

The division of using fuels shall be as given in Table 1.

Table 1. Division of Using Fuels

Using fuel	Symbol
No. 1 specified in JIS K 2203	K 1
No. 2 specified in JIS K 2203	K 2
All classes specified in JIS K 2204	G
Class 1 specified in JIS K 2205	A
Class 2 specified in JIS K 2205	B
Class 3 specified in JIS K 2205	C

Applicable Standards: See page 40.

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3. Division of Appliances

3.1 Division of Appliances According to Burning System The division of appliances according to burning system shall be as given in Table 2.

Table 2. Division of Appliances According to Burning System

Division	Content of division	Informative reference
Wick feed type	System to burn with evaporation of fuel by wick	Attached Fig. 1
Pot type	System to burn with evaporation of fuel by evaporating dish, and the carburetion part and burning part are integrated.	Attached Fig. 2
Pressure spray type	System to vaporize fuel by pressure and to burn with evaporation, and its carburetion part and burning part are integrated.	Attached Fig. 3
Rotary vaporization type	System to vaporize fuel by centrifugal force and to burn with evaporation.	Attached Fig. 4
Jet spray type	System to vaporize fuel by air jet and to burn with evaporation, and its carburetion part and burning part are integrated.	Attached Fig. 5
Carburetion type	System to burn to fuel in burning part after evaporating in carburetion chamber or tube, of which carburetion part and burning part are divided.	Attached Fig. 6

3.2 Division of Appliances According to Draft System The division of appliances according to draft system shall be as given in Table 3.

Table 3. Division of Appliances According to Draft System

Installing place	Division		Content of division	Informative reference
	Type	Style		
Indoor use	Open type	Natural vent style	System to feed air required for burning from inside of room according to natural vent force and to exhaust the burning exhaust gas as it is to inside of room.	Attached Fig. 7
		Forced vent style	System to feed air required for burning from inside of room by vent force of blower and to exhaust the burning exhaust gas as it is to inside of room.	Attached Fig. 8
	Semi closed type	Natural vent style	System to feed air required for burning from inside of room by natural vent force and to exhaust burning exhaust gas to outside of room.	Attached Fig. 9
		Forced vent style	System to feed air required for burning from inside of room by vent force of blower and exhaust cylinder and to exhaust burning exhaust gas to outside of room.	Attached Fig. 10
		Forced exhaust gas style	System to feed air required for burning forcedly from inside of room by blower or exhauster and to exhaust forcedly burning exhaust gas to outside of room.	Attached Fig. 11
	Closed type	Forced draft style	System to extrude draft tubes through wall or the like contacting the atmospheric air to outside of room and to carry out forcedly the draft by blower or exhauster.	Attached Fig. 12

Table 3 (Continued)

Installing place	Division		Content of division	Informative reference
	Type	Style		
Outdoor use	Open style		System to be installed at outdoor, to feed air required for burning from the installing place, and to discharge the burning exhaust gas as it is to installing place.	Attached Fig. 13
	Natural vent style		System to be installed at outdoor, to feed air required for burning by natural vent force of exhaust cylinder and to discharge the burning exhaust gas through exhaust gas cylinder to installing place.	Attached Fig. 14
	Forced vent style		System to be installed at outdoor, to feed air required for burning from the installing place by vent forces of blower and exhaust gas cylinder.	Attached Fig. 15
	Forced exhaust gas style		System to be installed at outdoor, to feed air required for burning forcedly from the installing place by blower or exhauster and to discharge forcedly the burning exhaust gas to the installing place.	Attached Fig. 16
	Forced draft style		System to be installed at outdoor, and to carry out draft forcedly at installing place by blower or exhauster.	Attached Fig. 17

3.3 Division of Appliances According to Heat Medium and Use Division System

The division of appliances according to heat medium and use division system shall be as given in Table 4.

Table 4. Division of Appliances According to Heat Medium and Use Division System

Division		Content of division
Heat medium system	Use division system	
Warming air system	For heating	Radiation style System to improve heating effect by reflecting plate and the like and of appliance of 15 % or more in radiation effect ⁽¹⁾ .
		Natural convection style An appliance of system to make inside-room temperature higher by natural circulation of inside-room air according to the fact that the warmed air rises and the cooled air lowers.
		Forced convection style An appliance of direct blow-off style ⁽²⁾ and duct connecting style ⁽³⁾ of system to make higher inside-room temperature by diffusion or discharge of warmed air by blower or the like.
Warming water system	For heating	An appliance to supply warm water as heat source to heat emission appliance.
	Hot water supplying	An appliance to supply warm water heated rapidly or stored with heating.
	For bath	An appliance to make water temperature higher by connecting the appliance and bath tank with a circulation tube.
For cooking		An appliance to be utilized for heat cookery by using a pan or the like.

Notes ⁽¹⁾ The radiation effect means the ratio of quantity of heat irradiated by reflecting plate of appliance to the total calorific value.
Further the measurement of radiation effect is to be in accordance with 45. Radiation Effect Test of JIS S 3031.

- ⁽²⁾ The direct blow-off style means a system to blow-off warm wind directly into inside of room.
- ⁽³⁾ The duct connecting style means the system to feed warm wind to a heating room according to a duct.

4. Construction

4.1 General Construction The construction of appliance shall be as follows:

- (1) The appliance shall have sufficient strength and safety at the time of transportation, installation, running, etc.
- (2) The appliance is free from oil leak from any part and is not such structure that the spilled oil is applied to the following part to transmit or to be accumulated at the time of feeding of oil, maintenance, etc.
 - (a) Oil tank, burning cylinder, or part just under the fuel piping
 - (b) Parts exposed to burning gas
 - (c) Parts difficult to be found or cleaned
 - (d) Electric parts and wiring
 - (e) Other parts having a fear of generating fire
- (3) In the case where wind is received during burning, there is no fear to become such dangerous condition that the fire flame goes out to outside of appliance, the fire flame transfer easily to oil amount controller, oil tank and other parts accumulated with oil and risk is caused.
- (4) Appliances of wick style having no wick adjusting mechanism and to be used by fixing, of which burning is influenced remarkably by inclination are provided with horizontal adjusting legs without easy falling off.
- (5) Water drops condensated in appliance do not fall on burner, electric parts or other easily corrosive parts.
- (6) In the case where heat reflecting plate, thermal insulating material, etc. are used, these are fitted at correct position so as not to fall off.
- (7) Burner parts shall be as follows:
 - (a) The burner is free from remarkable deformation or deterioration during using.
 - (b) The burner is capable of being attached at correct position and capable of maintenance, check, cleaning, etc.
 - (c) The burner is free from risk due to overheating.
 - (d) The appliance of such construction as to recovery the fuel accumulated in inside of burner has no fear of back firing in oil tank.
 - (e) Plural burners are of such construction as not to be influence mutually and respective burners satisfy (a) to (d).

(8) Burning chamber and heat interchanger shall be as follows:

- (a) Joints of burning chamber and heat interchanger is kept at gas tightness required corresponding to style of appliance.
- (b) Doors, covers, etc. to be attached to burning chamber and heat interchanger are kept at gas tightness required under the ordinary use condition.
- (c) In the case where fire proofing materials such as refractory bricks and the like are attached to inside of burning chamber, the fire proofing materials are fixed surely at specified position and, capable of being interchanged or repaired.
- (d) The burning chamber is capable of being cleaned at inside.

(9) The appliance provided with a baffle plate at passage of burning gas are free from remarkable deformation or deterioration of baffle plate by burning gas.

(10) The appliance built in with air filter is easy in cleaning of air filter. Further, in the case of plastic air filter, it is provided at a place of 70°C or lower in environmental temperature during ordinary using.

(11) The burner requiring air regulation is capable of opening and closing of air regulating damper easily and after regulation, capable of fixing of damper securely.

(12) The appliance is provided with a device capable of confirming horizontality.

(13) Wick regulator, fuel-regulation valve, and operating direction of knobs are in accordance with Table 5.

Further, switches are, as a rule, in accordance with specifications of JIS C 0601.

Further, the appliance which uses no power source for general domestic use and is capable of wick regulation and ignition by one actuation by displacing the lever downward, is so made that the knob of lever does not go out from the outside surface of appliance body and not ignite in mistake by protecting with operation doors or the like.

Table 5. Wick Regulator and Valves, and Operation
Direction of Knobs

Division		Ignition direction or opening	Fire extinguishing direction or closing
Wick regulator (in the case of wick type)	Rotary style	Right rotation 	Left rotation 
	Lever style	Right displacement 	Left displacement 
Feed oil valve Oil amount regulating valve	Rotary style	Left rotation 	Right rotation 
	Lever style	Right displacement 	Left displacement 
		Downward displacement 	Upward displacement 

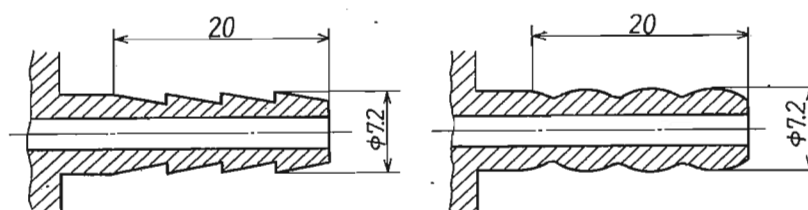
(14) Fuel piping shall be as follows:

- (a) The connecting part of fuel piping is capable of attaching the pipe securely without oil leak and, of detaching.
- (b) The fuel piping and connecting part have no fear for easy deformation and running out.
- (c) For the fuel piping used in inside of appliance, as a rule, metallic pipes are used. However, using of metallic pipes is not suitable for construction or using, pipes not to be corroded by using fuel other than metallic pipe may be used.
- (d) In the case where the oil tank is separated from appliance body, the fuel piping connecting oil tank with appliance body is to be metallic pipe. However, for the fuel piping to be used for appliance used for indoor using kerosine as fuel, the oil-feed pipe made of rubber specified in JIS S 3022 may be used. In this case, the shape and dimensions of fuel piping connecting metal fitting of inserting style are, as a rule, in accordance with either one of those shown in Fig. 1 and the connecting metal fittings and oil-feed pipe are connected rigidly by band fastening or the like.

Further, in the case of screw-thread connecting style, the screw threads of connecting part are in accordance with JIS B 0203, as a rule.

Fig. 1. Shape and Dimensions of Connecting Metal Fittings of Inserting Style

Unit: mm



- (15) In the case of attaching oil-amount regulator or oil-face regulator, it shall be as follows:
- (a) The oil-amount regulator is the one complying with the specification of JIS S 3019 or those equivalent or superior thereto.
 - (b) The oil-face regulator is capable of control the oil face correctly.
- (16) Electric ignitor shall be as follows:
- (a) The electric ignitor is capable of igniting safely and securely and endurable for a long time use.
 - (b) The electric ignitor is not to be damaged in insulating property by heat or the like during using.
 - (c) In the case of ignitor combined with a dry cell and heater, the heater voltage is 6 V or less, the electric current, 3 A or less, and the dry cell and heater are able to be exchanged easily.
Further, the heater is applied with electric current at a position within 20 mm from wick, and is capable of igniting smoothly and securely..
 - (d) In the case of ignitor without using dry cell as power source, the heater or electrode can be exchanged.
 - (e) In the case of using ignition transformer other than high voltage pulse type, those complying with the reference of engineering specified in the Electrical Appliance and Material Control Law are to be used.
 - (f) Electrodes are difficult to be damaged with crazing and the like.
- (17) The appliance to ignite by using a piezoelectric element unit shall be as follows:
- (a) It is to be fixed so as the space between the charging part and the non-charging part of high voltage wiring not to vary.
 - (b) The part having a fear of contacting at the time of ordinary using, bare high voltage piping, etc. are provided with effective insulating coating.

- (18) The appliance using no electric igniting system is easy and secure in ignition and the treatment after igniting is also safe.
- (19) In the case of attaching a placing stand to appliance, it shall be as follows. However, in the case of attaching no placing stand to appliance, the bottom plate is to be taken into sufficient consideration for heat insulation and oil leak to the floor surface.
 - (a) The oil leak from any part of appliance, if exists, is to be such size that it does not drop outside the placing stand.
 - (b) The stand is to be made such shape that the spilled oil on the placing stand is not accumulated on a non-visible part by making the middle part high and the like.
 - (c) The corner parts are rounded to have no fear to be deformed easily.
- (20) The construction for ordinary maintenance shall be as follows:
 - (a) Handling, cleaning, regulating, repairing and connecting operation are easy.
 - (b) Parts requiring detachment for cleaning, repairing, etc. are able to be attached and detached easily by means of ordinary tools or appended exclusive use tools.
 - (c) The outside plate, inside plate, etc. to be detached for ordinary maintenance are to be able to be detached easily.

4.2 Construction in Division of Burning System

4.2.1 Construction of Wick Style Appliance The construction of wick style appliance shall be as follows:

- (1) The burning regulator (wick regulator) is smooth and secure in operation and free from oil leak.
 - (2) The wick part⁽⁴⁾ is easily and securely attached and detached for appliance body and even when the appliance is overturned, it is not fallen down.
- Note ⁽⁴⁾ The wick part means an integral body of wick, wick stopper, wick regulator, wick outside cylinder, etc.
- (3) The wick does not rise by a definite height or over.
 - (4) The feed oil opening is not higher than the wick guide cylinder upper part and air hole of oil tank.
 - (5) The wick complying with specifications of JIS S 2038 is to be used.
 - (6) The feed-oil valve attached to the appliance without wick lifting-and-lowering mechanism is to be smooth and secure in opening and closing and free from oil leak.

Further, a portion having a fear of oil leak is made higher than the upper surface of oil receiving dish.