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Closed type oil burning space heaters

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently, JIS S 2031 : 1991 has been revised and replaced with this Standard. In this revision, for the purpose of promotion for spreading of closed type oil burning space heaters, not only provisions on construction in respect to the take out position of supply and exhaust pipe are added intending the standardization, but also revision is made for quality performance, construction, etc., corresponding to the progress of technical development.

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In the event of any doubts arising as to the contents,
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Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Classes	1
3.1 Classes of space heater by the method of combustion	1
3.2 Classes of space heater by the supplying and exhausting system	1
3.3 Classes of space heater by the use division system	1
4 Performance	2
4.1 Using performance	2
4.2 Quality performance	2
5 Structure	8
5.1 General structure	8
5.2 Structure of space heater classified by combustion system	8
5.3 Structure of space heater classified by supplying and exhausting system	9
5.4 Structure of oil tank	9
5.4.1 Structure of oil tank being apart from the space heater	9
5.4.2 Structure of oil tank being united in one body with the space heater	9
5.5 Structures of electric apparatus, wiring parts, etc.	10
5.6 Structure of earthquake breaker	10
5.7 Structures of safety device and control device	10
6 Materials	10
7 Working method	10
8 Appearance	10
8.1 Appearance	10
8.2 Rust prevention	11
9 Accessories	11
9.1 Clamping metal fittings for oil feed rubber tube	11
9.2 Supply and exhaust pipe	11
10 Test methods	11
10.1 Structure	11

S 2031 : 1997

10.2	Materials	11
10.3	Working method	11
10.4	Appearance	11
10.5	Accessories	11
10.6	Marking	11
10.7	Instruction manual	11
10.8	Marking and instruction manual of export commodities	11
11	Inspection	11
11.1	Type inspection	11
11.1.1	Execution of type inspection	11
11.1.2	Sampling method and size of sample	12
11.1.3	Inspection items	12
11.1.4	Judgement of acceptance	12
11.1.5	Inspection record	12
11.2	Product inspection	12
11.2.1	Execution of product inspection	12
11.2.2	Inspection items	12
11.2.3	Judgement of acceptance	12
11.2.4	Inspection record	12
12	Marking.....	13
12.1	Rating marking	13
12.2	Instruction marking	13
12.3	Marking of cocks, knobs, etc.	14
12.4	Marking of switch for ignition and extinction or operation and stop ...	14
12.5	Marking of oil level indicator	14
12.6	Marking of oil tank	14
12.7	Marking of acceptance of type inspection	14
13	Instruction manual	15
14	Marking and instruction manual of export commodities	15
Attached Fig. 1	Natural convection type	16
Attached Fig. 2	Forced convection type	17
Attached Fig. 3	Forced convection type	18
Attached Fig. 4	Natural convection type	19
Attached Table 1	Normative references	20
Attached Table 2	Materials	21
Attached Table 3	Plate thickness of materials	22

Closed type oil burning space heaters

Introduction The closed type oil burning space heater whose system is to take the air for burning forcibly from the outdoors and take the combustion exhaust away to the outdoors has the characteristic not polluting the air in the room. It went on the market in 1972 to 1973 and, along with the rapid increases of the needs for it, it had been standardized in 1975 as **JIS S 2031** from the standpoint to improve the quality and secure the safety in preventing fire.

1 Scope This Japanese Industrial Standard specifies the oil burning space heaters of the closed type⁽²⁾ (hereafter referred to as "space heaters"), which use kerosine, gas oil or heavy oil as fuel, and are not more than 2 200 g/h in fuel consumption⁽¹⁾.

Notes (1) The amount of fuel consumption is the indicated amount of fuel to be burnt per hour when setting the oil quantity control device at the maximum.

(2) The closed type is the "closed type" specified in 3.2 of **JIS S 3030**.

2 Normative references The standards shown in Attached Table 1 contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards shall be applied.

3 Classes

3.1 Classes of space heater by the method of combustion The classes of space heater by the method of combustion shall be "pot type", "pressure spray type" "rotary vaporization type", "jet spray type" and "carburetion type" which have been specified in 3.1 of **JIS S 3030**.

3.2 Classes of space heater by the supplying and exhausting system The classes of space heater by the supplying and exhausting system shall be "forced draft style" and closed type for indoor use specified in 3.2 of **JIS S 3030**.

3.3 Classes of space heater by the use division system The classes of space heater by the use shall be "natural convection style" and "forced convection style" which have been specified in 3.3 of **JIS S 3030**, and shall be given in Table 1 (see Attached Figs. 1 to 4).

Table 1 Classes of space heater by use

Class	Form of warming	Informative reference
Natural convection style	Space heater blowing heat upward and forward	Attached Figs. 1 and 4
Forced convection style	Space heater blowing warm air forward	Attached Fig. 2
	Space heater blowing warm air upward and forward	Attached Fig. 3

4 Performance

4.1 Using performance The using performance of space heater shall be in accordance with the following:

- a) The ignition is easy, and the use of dangerous matters of high inflammability such as alcohol and the like and the dangerous operation are not required.
- b) Working of each part is smooth, reliable, and free from defects harmful to use.
- c) Knobs and the like do not cause deformation easily during using, nor cause abnormalities to working.
- d) When the temperature has risen abnormality due to abnormal combustion or the like, it is able to stop burning of burner automatically.
- e) The operation is easy and at that time there is no fear of generating danger.
- f) The operation of extinction of flame can be carried out quickly and securely.
- g) During combustion according to normal handling, it does not become such condition that oil smoke adheres to inspection window and the combustion condition can not be confirmed.
- h) The space heater having a combustion control device has no fear that at each combustion amount, the flame becomes abnormally large, remarkable smoke is generated or other abnormal combustion is caused.

4.2 Quality performance The quality performance of space heater, when tested according to 10, shall comply with the specifications of Table 2.

Table 2 Quality performance

Item		Quality performance	Applicable item number of JIS S 3031
Combustion performance	a) Surface temperature of part to be applied with hand such as knob ⁽³⁾	The difference between the measured temperature and room temperature is not higher than 25 °C in metal and ceramic wares, and not higher than 35 °C in plastics.	5.1 and 5.2 (1)
	b) Surface temperature of part having a fear to be touched with hand ⁽⁴⁾	150 °C max.	5.1 and 5.2 (2)
	c) Surface temperature of rectification body	For that made of selenium, 75 °C max. For that made of germanium, 60 °C max. For that made of silicon, 135 °C max.	5.1 and 5.2 (3)
	d) Surface temperature of the contact part of fuse-clip	90 °C max.	5.1 and 5.2 (4)
	e) Surface temperature of oil tank	The difference between the measured temperature and room temperature is 25 °C max.	5.1 and 5.2 (5)
	f) Surface temperature of wooden stand at lower surface of space heater	80 °C max. 45 °C max. for that not given space between lower surface of space heater and placing stand or floor	5.1 and 5.2 (6)
	g) Surface temperature of wooden stand at periphery of space heater	80 °C max.	5.1 and 5.2 (6)

Table 2 (continued)

Item		Quality performance	Applicable item number of JIS S 3031
Combustion performance	h) Surface temperature of wooden wall at side face of space heater	90 °C max.	5.1 and 5.2 (6)
	i) Surface temperature of wooden wall at upper surface of supply and exhaust pipe	90 °C max.	5.1 and 5.2 (6)
	j) Surface temperature of wooden wall around supply and exhaust pipe top (Limited only to that using supply and exhaust pipe top that makes the distance between the outer wall and the edge of supply and exhaust pipe top 150 mm or shorter when mounted by the method instructed by the manufacturer.)	90 °C max.	5.1 and 5.2 (6)
	k) Surface temperature of supply and exhaust tube of part contacting with the wall	90 °C max.	5.1 and 5.2 (7)
	l) Temperature of winding of electric motor and electromagnetic pump	That of A class insulation 100 °C max. That of E class insulation 115 °C max. That of B class insulation 120 °C max. That of F class insulation 140 °C max. That of H class insulation 165 °C max.	5.1 and 5.2 (8)
	m) Oil temperature	Difference between the measured temperature and room temperature 25 °C max.	5.1 and 5.2 (9)
	n) Combustion condition and using performance	There are no abnormalities such that during combustion, the flame becomes large, back-fire is caused, visible smoke is caused, and such as oil leak, rupture, etc., and the specifications of 4.1 are complied with.	5.3 and 31.1
	o) Warm wind temperature (Limited only to that of forced convection style and blowing warmed wind forwards.)	80 °C max.	5.4
	p) Temperature of heated air (Limited only to that of forced convection style blowing warm wind forward and upward and that of natural convection style.)	150 °C max.	5.5
	q) Temperature of exhaust air	260 °C max.	5.6.1
	r) The ratio of carbon monoxide to carbon dioxide in combustion exhaust gas (CO/CO ₂)	0.02 max.	5.7

Table 2 (continued)

Item		Quality performance	Applicable item number of JIS S 3031
Combustion performance	s) Concentration of soot and smoke	Smoke scale "5" max.	5.9
	t) Space heater output	90 % min. of marked output (maximum)	5.11.1
	u) Thermal efficiency	70 % min. to input	5.12.1
		90 % min. to marked thermal efficiency	
	v) Time of extinction of flame	Pot type Within 400 s Pressure spray type Within 10 s Rotary vaporization type Within 20 s Jet spray type Within 10 s Carburetion type Within 20 s	5.14
	w) Fuel consumption amount (max.)	The difference to marked fuel consumption amount (max.) ± 10 %	5.15.1
Overload combustion [This shall be applied only to the heaters having an oil control valve ⁽⁵⁾ .]		To meet the specifications of combustion performance (excluding thermal efficiency and fuel consumption amount). Furthermore, the space heaters equipped with the airflow quantity control device capable of being operated from the outside shall be free from explosion, abnormal combustion and others even when taking the airflow quantity control device as maximum or minimum.	6
Combustion performance by excess fuel [for only pot type having oil control valve ⁽⁵⁾]	Combustion condition and using performance	To be free from change in position of each part, going out of flame to outside of space heater, oil leak, breakage, etc. during combustion and to comply with the specification of 4.1 after testing.	9
	Surface temperature of wooden wall of the side face of space heater	100 °C max.	
Inclined combustion (Limited only to that not equipped with horizontality control legs and device capable of confirming horizontality.)		To be free from becoming large flame and arising remarkable smoke.	10.1
Humidifying capacity		Humidifying capacity of built-in humidifier: for that not exceeding 8 280 kJ/h in marked space heater output 2.3 kW: 70 g/h min. and for that exceeding 8 280 kJ/h: 100 g/h min.	13
Actuation of overheat preventive device		To work without hindrance.	14.1
Semichoking resistance		The overheat preventive device actuates and it is free from light up of gauze, going-out of flame to outside of space heater, and other dangerous condition. Further, for that of which overheat preventive device does not actuate, the warm wind temperature (surface of gauze) does not exceed 180 °C and the surface temperature of casing does not exceed 150 °C.	15

Table 2 (continued)

Item		Quality performance	Applicable item number of JIS S 3031
Wind velocity resistance		a) During applying respective wind velocities of 5 m/s, 10 m/s and 20 m/s, and within 5 min since stopping of wind, the following requirements shall be satisfied. Even when reigniting, explosive burning is not caused. 1) to be free from coming-in of fresh gas or exhaust gas in room, 2) to be free from going-out of flame to inside or outside of space heater from combustion chamber. b) For that in which extinction of flame is caused by wind, after stopping of wind, explosive combustion due to remaining heat energy of combustion chamber not caused. Further, even when reigniting, explosive combustion is not caused.	21.1 and 21.2
Wind pressure resistance		For wind pressure at 60 Pa and 250 Pa, it complies with following specifications. a) Light up is generated. b) Extinction of flame is not caused. c) Abnormal combustion is not caused. d) Soot-and-smoke concentration is "5" or less of smoke scale. e) CO/CO ₂ : 0.02 max. f) When the wind pressure is 60 Pa, the space heater output is free from change. Further, when the wind pressure is 250 Pa, the change of space heater output is not more than 20 % of that when not pressurized.	22
Airtightness		The leak amount is not more than 0.5 m ³ /h per 4.2 MJ/h in input.	23
Electric ignition		It ignites smoothly and surely.	24
Electric power consumption	Space heater of not higher than 100 W in rated power consumption	±15 % in difference to rated electric power consumption	25
	Space heater exceeding 100 W in rated electric power consumption	±10 % in difference to rated electric power consumption	
Noise	Marked space heater output For the space heaters of 6 kW : 21 600 kJ/h max.	Maximum combustion 45 dB max. Minimum combustion 40 dB max.	26
	Marked space heater output For the space heaters over 6 kW : 21 600 kJ/h to 12 kW : 43 200 kJ/h incl.	Maximum combustion 50 dB max. Minimum combustion 45 dB max.	
	Marked space heater output For the space heater exceeding 12 kW : 43 200 kJ/h	Maximum combustion 55 dB max. Minimum combustion 50 dB max.	
Service-interruption resistance		There shall be no fear to generate danger.	27