



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS S 3024 : 2009

(JHIA)

**Oil burning water heaters for
domestic use**

ICS 27.060.30; 91.140.65; 97.100.40

Reference number : JIS S 3024 : 2009 (E)

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Date of Establishment: 1977-03-01

Date of Revision: 2009-03-20

Date of Public Notice in Official Gazette: 2009-03-23

Investigated by: Japanese Industrial Standards Committee
Standards Board

Technical Committee on Consumer Life Products

JIS S 3024 : 2009, First English edition published in 2009-11

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

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Printed in Japan

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Contents

	Page
Introduction.....	1
1 Scope.....	1
2 Normative references	1
3 Classifications	2
3.1 Classification by burning system	2
3.2 Classification by draft system	2
3.3 Classification by feed water system	3
3.4 Classification by heating style.....	3
4 Performance	3
4.1 Working performance	3
4.2 General quality performance	4
4.3 Quality performance as water works equipment	9
5 Construction	11
5.1 General construction	11
5.2 Construction of water heaters according to the burning system	11
5.3 Construction of water heaters according to the draft system	11
5.4 Construction of water heaters according to the feed water system	11
5.5 Construction of oil tank	12
5.6 Construction of electric system, wiring part and the like	12
5.7 Construction of safety devices	12
5.8 Construction of boil-dry safety mechanism	13
6 Materials	13
7 Processing	13
8 Appearance	13
8.1 Appearance	13
8.2 Rust prevention.....	13
9 Exhaust terminal and supply and exhaust tube	13
9.1 Exhaust terminal	13
9.2 Supply and exhaust tube	14
10 Test methods	14
10.1 Pressure resistant test	14
10.2 Low temperature resistant test	14
10.3 Water hammer limiting test	14
10.4 Reverse flow prevention test	14
10.5 Negative pressure breaking test	14

10.6	Leaching test	14
11	Inspection	14
11.1	Type inspection	14
11.2	Product inspection	15
12	Marking	16
12.1	Marking of ratings	16
12.2	Instruction marking	16
12.3	Marking on cocks, knobs and the like	17
12.4	Marking on switch of ignition/extinction or start/stop operation	17
12.5	Marking on oil level meter	17
12.6	Marking on oil tank	17
12.7	Marking on water piping joints	17
12.8	Markings for pressure reducing valve and relief valve to be used	18
12.9	Marking on earth terminal	18
12.10	Marking of type inspection passed	18
13	Instruction manual	18

Foreword

This translation has been made based on the original Japanese Industrial Standard 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 Heating Appliances Inspection Association (JHIA) 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 3024:2007** is replaced with this Standard.

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Oil burning water heaters for domestic use

Introduction

This Japanese Industrial Standard was established in 1977 and has gone through seven revisions to this day. In this revision, the requirements for quality performance have been revised to respond to the Ordinance of the Ministry of Economy, Trade and Industry with respect to the technical requirements for specified products prescribed under the provisions of Consumer Product Safety Act and its Enforcement Ordinance.

The corresponding International Standard has not yet been published at this moment.

1 Scope

This Standard specifies oil burning water heaters for domestic use mainly for hot water supply, fueled by kerosine, light oil or fuel oil, with a fuel consumption¹⁾ of 70 kW or less and a heat exchanger capacity of 30 L or less (hereafter referred to as “water heaters”).

Note ¹⁾ The fuel consumption means a value of burning amount at the maximum burning indicated in calorific value per hour.

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 A 9504 *Man made mineral fibre thermal insulation materials*
- JIS A 9510 *Inorganic porous thermal insulation materials*
- JIS B 0203 *Taper pipe threads*
- JIS B 8410 *Pressure reducing valves for water works*
- JIS B 8414 *Relief valves for hot water appliances*
- JIS C 3301 *Rubber insulated flexible cords*
- JIS C 3306 *Polyvinyl chloride insulated flexible cords*
- JIS C 3307 *600 V Polyvinyl chloride insulated wires*
- JIS C 3312 *600 V Grade polyvinyl chloride insulated and sheathed portable power cables*
- JIS C 3323 *600 V Silicone rubber insulated wires*
- JIS C 3327 *600 V Rubber insulated flexible cables*
- JIS C 3405 *Road vehicles—High tension cables*
- JIS C 4003 *Thermal evaluation and classification of electrical insulation*
- JIS G 3101 *Rolled steels for general structure*
- JIS G 3131 *Hot-rolled mild steel plates, sheets and strips*

- JIS G 3141 *Cold-reduced carbon steel sheets and strips*
JIS G 3302 *Hot-dip zinc-coated steel sheet and strip*
JIS G 3452 *Carbon steel pipes for ordinary piping*
JIS G 4305 *Cold-rolled stainless steel plate, sheet and strip*
JIS H 3100 *Copper and copper alloy sheets, plates and strips*
JIS H 3260 *Copper and copper alloy wires*
JIS H 3300 *Copper and copper alloy seamless pipes and tubes*
JIS K 6343 *Rubber hoses for oil discharge*
JIS R 2304 *Fireclay brick*
JIS R 2501 *Refractory mortars*
JIS R 3414 *Textile glass fabrics*
JIS S 0011 *Guidelines for all people including elderly and people with disabilities—Marking tactile dots on consumer products*
JIS S 0012 *Guidelines for all people including elderly and people with disabilities—Usability of consumer products*
JIS S 3020 *Oil tanks for oil burning appliances*
JIS S 3025 *Supply and exhaust pipes for burning appliances*
JIS S 3030 *General rules for construction of oil burning appliances*
JIS S 3031 *General rules for test methods of oil burning appliances*
JIS S 3200-1 *Equipment for water supply service—Test methods of hydrostatic pressure*
JIS S 3200-2 *Equipment for water supply service—Test method of low temperature resistant*
JIS S 3200-3 *Equipment for water supply service—Test method of water hammer*
JIS S 3200-4 *Equipment for water supply service—Test method of prevention from back current*
JIS S 3200-5 *Equipment for water supply service—Test methods of destruction by vacuum pressure*
JIS S 3200-7 *Equipment for water supply service—Test methods of effect to water quality*
JIS Z 8305 *Dimensions of printing types*

3 Classifications

3.1 Classification by burning system

Water heaters shall be classified by the burning system into “pressure spraying type”, “rotary atomization type” and “carburetion type”, as specified in 4.1 of JIS S 3030.

3.2 Classification by draft system

Water heaters shall be classified by the draft system as given in table 1, in accordance with 4.2 of JIS S 3030.

Table 1 Classification by draft systems

Installation location	Division	
	System	Type
Indoor	Semiclosed	Forced vent type
		Forced exhaust type
	Closed	Forced draft type
Outdoor	Open type	
	Forced vent type	
	Forced exhaust type	
NOTE : Those capable of both indoor and outdoor uses may be referred to as indoor/outdoor use.		

3.3 Classification by feed water system

The classification of water heaters by the feed water system shall be as given in table 2.

Table 2 Classification by feed water system

Classification	Feed water system	Informative
Direct water works coupling type	Connecting directly with a water service pipe and water is fed by the straight pressure of water works.	Figure 1
	Connecting directly with a water service pipe and water is fed through a pressure reducing valve and an relief valve at the pressure of 0.1 MPa or under.	Figure 2
Cistern type	Not directly connecting with a water service pipe and water is fed through a cistern and the like in which the water is temporarily stored.	Figure 3

3.4 Classification by heating style

The classification of water heaters by the heating style shall be as given in table 3.

Table 3 Classification by heating style

Classification	Heating style	Informative
Instantaneous heating	Detecting a water flow through the passage in the apparatus, starts automatically burning to heat the water.	Figure 4
Storing water quick heating	Starting burning automatically correlating with the water temperature, under application of a pressure to the water in the apparatus, to heat the water.	Figure 5

4 Performance

4.1 Working performance

The working performance of water heaters shall be in accordance with the following:

- a) Ignition shall be easy and shall not require using any dangerous highly flammable substance such as alcohol or any dangerous operation.
- b) The actuation of each part shall be smooth, secure and free from defects detrimental to use.
- c) Knobs and the like shall not easily deform or function abnormally during use.
- d) The burner shall automatically stop burning at an unusual temperature rise due to abnormal burning and the like.
- e) Operation shall be easy and shall not cause any danger.
- f) Flame shall be extinguished rapidly and securely.
- g) Those having an observation aperture shall be free from such soot adhesion on the aperture which hinders the confirmation of burning during a burning in normal operation.
- h) Those provided with a burning control device shall not be liable to cause abnormal flame enlargement, visible smoking or any other abnormal burning, at any of each burning amount.

4.2 General quality performance

The general quality performance of water heaters, when tested by the methods mentioned in clause 10, shall conform to the specifications given in table 4.

Table 4 General quality performance

Item		Quality performance	Applicable clause and subclause of JIS S 3031
Burning performance	a) Surface temperature of manually handled parts such as knobs ^{a)}	Difference between measured and room temperatures shall be 25 °C or lower for metal and ceramics, and 35 °C or lower for plastics.	6.1 and 6.2 a)
	b) Surface temperature of parts liable to be touched by hand ^{b)}	150 °C or less	6.1 and 6.2 b)
	c) Surface temperature of rectifier	Selenium 75 °C or lower Germanium 60 °C or lower Silicon 135 °C or lower	6.1 and 6.2 c)
	d) Surface temperature of contact part of fuse clip	90 °C or lower	6.1 and 6.2 d)
	e) Surface temperature of oil tank	Difference between measured and room temperatures shall be 25 °C or lower.	6.1 and 6.2 e)
	f) Surface temperature of wooden base under the apparatus	Difference between measured and room temperatures shall be 65 °C or lower.	6.1 and 6.2 f)
	g) Surface temperature of wooden base around the apparatus	Difference between measured and room temperatures shall be 65 °C or lower.	6.1 and 6.2 f)

Table 4 (continued)

Item		Quality performance	Applicable clause and subclause of JIS S 3031
Burning performance (continued)	h) Surface temperature of wooden wall over the apparatus	Difference between measured and room temperatures shall be 65 °C or lower.	6.1 and 6.2 f)
	i) Surface temperature of wooden side wall of apparatus	Difference between measured and room temperatures shall be 65 °C or lower.	6.1 and 6.2 f)
	j) Surface temperature of wooden front wall of apparatus	Difference between measured and room temperatures shall be 65 °C or lower.	6.1 and 6.2 f)
	k) Surface temperature of wooden wall over exhaust pipe or draft pipe (only for forced exhaust and forced draft types for indoor use, and open and forced exhaust types for outdoor use)	Difference between measured and room temperatures shall be 65 °C or lower. Forced exhaust type water heaters whose installation conditions are specially indicated by an instruction or a manual need not comply with this requirement.	6.1 and 6.2 f)
	l) Surface temperature of wooden wall around the vent terminal (only for forced draft types for indoor use which use the vent terminal of which length from the outer wall to the point of the vent terminal is no more than 150 mm when installed as specified by the manufacturer)	Difference between measured and room temperatures shall be 65 °C or lower	6.1 and 6.2 f)
	m) Surface temperature of exhaust pipe or draft pipe adjacent to wall (only for forced exhaust and forced draft types for indoor use)	90 °C or lower Forced exhaust type water heaters whose installation conditions are specially indicated by an instruction or a manual need not comply with this requirement.	6.1 and 6.2 g)
	n) Temperature of coils of motor and solenoid pump	Class A insulation 100 °C or lower Class E insulation 115 °C or lower Class B insulation 120 °C or lower Class F insulation 140 °C or lower Class H insulation 165 °C or lower	6.1 and 6.2 h)
	o) Oil temperature	Difference between measured and room temperatures shall be 25 °C or lower.	6.1 and 6.2 i)
	p) Burning condition and working performance	There shall be no abnormalities during burning such as flame enlargement, backfire, visible smoke, oil leakage, breakage, etc., and shall conform to the specifications of 4.1 .	6.3 and 31.1