

Eco Mark Product Category No.154

**“Solar Heating System Version 1.0”
Certification Criteria**

—Applicable Scope—

Solar Heating System

Established: October 1, 2013
Expiration: September 30, 2020

Japan Environment Association
Eco Mark Office

Eco Mark Product Category No.154

“Solar Heating System Version 1.0” Certification Criteria

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1. Purpose of establishing criteria

Omitted

2. Applicable Scope

Solar Heating System

3. Terminology

Omitted

4. Certification Criteria and Certification Procedures

The product shall comply with all of criteria items (1)-(14). With respect to conformance to criteria items, the corresponding boxes in the Attached Certificates shall be checked/filled in, stamped with the applicant company seal and submitted along with the appendix.

4-1. Environmental Common Criteria and Certification Procedures

(1) The system shall have any of the main component devices shown in Table 1 and shall satisfy the heat collecting performance of the relevant device.

Table 1 Heat collecting performance against amount of solar radiation per day

Main component	Thermal energy collection [kJ/m ² -day]	Test method
Solar water heater (Thermal energy collecting unit)	8,374 or more	JIS A 4111: 2011 9.1 Heat collecting performance test
Liquid-based solar collector	8,372 or more	JIS A 4112: 2011 10.1 Heat collecting performance test

Solar air heat collector	6,279 or more	JIS A 4112: 2011 10.1 Heat collecting performance test
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[Certification Procedures]

The applicant shall fill in the required items on the attached certificate and submit the test results.

(2) The system shall have any of the main component devices shown in Table 2 and shall satisfy the heat-insulation performance of the relevant device.

In this regard, however, in the solar air heat collection system, if heat storage and space-heating are directly carried out to a building (concrete, etc.) without having a heat storage tank, simulations shall have been conducted to independently predict the indoor warmer environment when the heat quantity stored in the building or the system is used so that satisfactory heat insulation performance is secured.

Table 2 Heat-insulation performance

Main component device	Heat loss coefficient [W/K]	Test method
Solar water heater (Hot water storage unit)	5.81 or less	JIS A 4111:2011 9.2 Heat-insulation performance test
Heat storage tank	$3.5V + 5.81$ or less V: Storage tank volume [m ³]	JIS A 4113:2011 9.2 Heat-insulation performance test

[Certification Procedures]

The applicant shall fill in the required items on the attached certificate and submit the test results.

(3) For more effective use of solar heat, the system shall conform to all relevant items of following mandatory items a. through c. and one or more items of selection items d. through i. by standard specifications or optional specifications.

[Mandatory items]

- a. In the case of a system for hot-water supply with no built-in auxiliary heat source, the connection method to existing auxiliary heat source (hot-water supply equipment) shall be defined (hot-water supply equipment compatible with solar

- system, separately required devices, piping, etc.).
- b. In the case of a system for hot-water supply with a built-in auxiliary heat source, the system shall have a function for supplying hot water with priority given to solar thermal conversion rather than the auxiliary heat source. Specifically, a gas water heater and oil-fired water heater shall have a function to heat water only by the heat quantity heated by solar heat without operating any auxiliary heat sources. A heat-pump electric water pump shall have a function to automatically or manually reduce the boiling up quantity by heat pump in accordance with the weather of the next day.
 - c. In the case of a system for hot-water supply with a built-in auxiliary heat source, the auxiliary heat source shall be a latent heat recovery type water heater or a heat pump type electric water heater, or shall provide the coefficient of performance equivalent to the judgment criteria of “water heaters, etc.” in “Basic policy for the procurement of eco-friendly goods, etc.” according to Article 6 of “Law Concerning the Promotion of Procurement of Eco-friendly Goods and Services by the State and Other Entities (Law on Promoting Green Purchasing).”

[Selection items]

- d. The heat collecting performance of heat collector shall be higher than the heat collecting performance prescribed in 4-1. (1) Table 1. Specifically, the thermal energy collection to the amount of solar radiation per day shall be 12,557 [kJ/m²-day] or more for liquid-based solar collectors and 8,372 [kJ/m²-day] or more for solar air heat collectors.
- e. The real-time heat collection condition of the system and the environmental effects by solar thermal conversion such as accumulated CO₂ emission reduction, etc. should be visualized by monitors, etc. for users.
- f. No electricity is used for heat collection of the water heating system and for circulation of a forced circulation system heat collection medium, or heat collecting operation can be conducted by natural energy (photovoltaic cells, etc.).
- g. Standby power consumption of main component devices proper shall be 2W or less.
- h. The system shall have a function to recover heat of remaining hot water in a bath tub and utilize it for heating in a heat storage tank.
- i. The system shall be a solar air heat collection type heating system and shall have the equipment that can utilize solar heat (water heating, etc.) even in seasons where heating is not required, such as summertime, etc.

[Certification Procedures]

The applicant shall fill in the required items on the attached certificate and submit the documents to explain the compliance with each item.

(4) The system shall have sufficient durability secured so that it can stand the use over a long period of time. In addition, a system for securing the installation quality shall have been established, such that solar installers certified by Solar System Development Association install the system or oversee the installation work.

[Certification Procedures]

The applicant must fill in the required information on the attached certificate and submit the data describing the compliance condition to durability and installation quality in the high-quality solar system certification system and an installation work system diagram.

(5) The system shall have a maintenance control system (consultation service and repair contract) formulated and shall have the written quality warranty attached. In addition, the quality warranty shall be free repair warranty (excluding disclaimers) of at least 5 years for the casing of hot-water storage unit or heat storage tank as well as heat collector, and at least 2 years for other portions or functions. Incidentally, the period of supplying repair and replacement components of component devices for residential use shall be at least 10 years after discontinuation of production of the devices.

[Certification Procedures]

The applicant shall fill in the required information on the attached certificate and submit copies, etc. of the applicable portions on which information is provided with respect to quality assurance, repair contract receiving system, and component supply period.

(6) Product shall be designed with recyclability of unrequired systems after use taken into account (selection of material, labeling of resin material, good separability between dissimilar materials (metal and plastics, etc.), and others).

[Certification Procedures]

The applicant shall fill in the required items on the attached certificate and submit the explanatory documents.

(7) Of thermal insulation material used for main component devices, recycled materials such as glass cullet, slag, etc. are used for glass wool, rock wool, and other

fiber-based heat-retention materials.

[Certification Procedures]

The applicant shall fill in the required information on the attached certificate and submit a material supply certificate issued by the insulation material supplier or contents of transaction, contract documents, and others which the use of recycled materials for heat insulation materials is prescribed.

(8) For main component devices, specific chlorofluorocarbons (5 kinds of CFC), other CFCs, carbon tetrachloride, trichloroethane, and alternatives for chlorofluorocarbon (HCFC and HFC) prescribed in Table 3 shall not be used. HFC used for coolant for cooling apparatus and air-conditioners should be excluded or coolants with as low global warming potential as possible shall be used.

Table3 Fluorocarbons prohibited to use during manufacturing the main units

CFC5s	Trichlorofluoromethane	HCFC	Chlorofluoroethane
	Dichlorodifluoromethane		Hexachlorofluoropropane
	Trichlorotrifluoroethane		Pentachlorodifluoropropane
	Dichlorotetrafluoroethane		Tetrachlorotrifluoropropane
	Chloropentafluoroethane		Trichlorotetrafluoropropane
Other CFCs	Chlorotrifluoromethane		Dichloropentafluoropropane
	Pentachlorofluoromethane		Chlorohexafluoropropane
	Tetrachlorodifluoroethane		Pentachlorofluoropropane
	Heptachlorofluoropropane		Tetrachlorodifluoropropane
	Hexachlorodifluoropropane		Trichlorotrifluoropropane
	Pentachlorotrifluoropropane		Dichlorotetrafluoropropane
	Tetrachlorotetrafluoropropane		Chloropentafluoropropane
	Trichloropentafluoropropane		Tetrachlorofluoropropane
	Dichlorohexafluoropropane		Dichlorofluoropropane
	Chloroheptafluoropropane		Chlorodifluoropropane
	Carbon tetrachloride	Chlorofluoropropane	
	1,1,1-Trichloroethane	HFC	Trifluoromethane
HCFC	Dichlorofluoromethane		Difluoromethane
	Chlorodifluoromethane		Fluoromethane
	Chlorofluoromethane		1,1,1,2,2-Pentafluoroethane
	Tetrachlorofluoroethane		1,1,2,2-Tetrafluoroethane
	Trichlorodifluoroethane		1,1,1,2-Tetrafluoroethane
	Dichlorotrifluoroethane		1,1,2-Trifluoroethane
	Chlorotetrafluoroethane		1,1,1-Trifluoroethane
	Trichlorofluoroethane		1,1-Difluoroethane
	Dichlorodifluoroethane		1,1,1,2,3,3,3-Heptafluoropropane

Chlorotrifluoroethane	1,1,1,3,3,3-Hexafluoropropane
Dichlorofluoroethane	1,1,2,2,3-Pentafluoropropane
Chlorodifluoroethane	1,1,1,2,3,4,4,5,5,5-Decafluoropentane

[Certification Procedures]

The applicant shall fill in the required items on the attached certificate.

(9) The solar air heat collection system shall satisfy “Standard of emission rate of volatile organic compounds from building products (Committee for standardization of emission rate of VOC from building products)” regarding emission of Toluene, Xylene, Ethylbenzene or Styrene from the main unit to the indoor air. (Table 4) In addition, with respect to the formaldehyde emission, the solar air heat collection system shall be rated “F four-stars” or be outside the scope of regulations set forth by the Minister of Land, Infrastructure and Transport, respectively.

Table 4 Standard value of VOC emission rate

Target VOC	Standard value of emission rate ($\mu\text{g}/\text{m}^2\text{h}$)
Toluene	≤ 38
Xylene,	≤ 120
Ethylbenzene	≤ 550
Styrene	≤ 32

[Certification Procedures]

Test results followed by JISA 1901 “Measuring methods for emission of volatile organic chemicals (VOC), formaldehyde and other carbonyl compounds—small chamber method” conducted by a third party testing body or an own company, or certificate issued by a manufacture showing no relevant substance added, etc. shall be submitted. Regarding formaldehyde, a certificate showing that the product has been rated Class “F four-stars” or approved by the Minister of Land, Infrastructure and Transport, etc. shall be submitted.

(10) With respect to systems for water heating, migration performance of hot effluent water of main component devices shall satisfy the standard of “Ministerial Ordinance concerning the standard of structure and material of feed water supply system (MHW Ministerial Ordinance No. 14 dated March 19, 1997).”

[Certification Procedures]

The applicant should fill in required information on the attached certificate and submit test results, etc. by JIS S 3200-7 (Equipment for water supply service -- Test methods of effect to water quality).

(11) The content rate of lead, mercury, cadmium and these compounds, hexavalent chromium compounds, Polybrominated biphenyl (PBB) or Polybrominated diphenylether (PBDE) in the main unit shall comply with Table 5. However, this item does not apply to those substances specified in the amended RoHS Directive (2011/65/EU) ANNEX III and those used due to an unavoidable reason for product safety (such as lead in the thermal fuse).

In addition, the product shall contain no flame retardant of short-chain chlorinated paraffin (the number of chained C is 10 to 13 and contained chloride concentration is 50% or over) as prescriptive constituents.

Table 5 Content rate in the main unit

material	Content rate[wt%]
Lead and its compounds	≤ 0.1
Mercury and its compounds	≤ 0.1
Cadmium and its compounds	≤ 0.01
Hexavalent chromium compounds	≤ 0.1
Polybrominated biphenyl (PBB)	≤ 0.1
Polybrominated diphenylether (PBDE)	≤ 0.1

* The content rate refers to the content proportion in a homogeneous substance (minimum unit that can be separated by rule with totally uniform composition).

[Certification Procedures]

The applicant should fill in required information on the attached certificate, and submit data explaining the investigation method (investigation sheet, test results, etc.) on the content percentage or non-inclusion of the relevant substance, as well as data describing the management system.

(12) With respect to the main component devices of the system, the information on the items shown in Table 6 is disclosed and easily accessible.

Table 6 Information disclosure items of solar heating system

Category	Item	Points to be checked
Heat collector	Presentation of thermal energy collection	Yearly estimated thermal energy collection Calculation conditions (amount of solar

	estimation method	radiation data, loss of heat collector and heat storage tank, etc. used for calculation)
	Conditions and factors of inability to obtain the standard heat collecting performance	Impact of shade, solar radiation conditions, impact of temperature, weather conditions, geographical conditions, etc.
Main component devices in general	Disposal	Disposal method and precautions at the time of disposal (in the event that HFC is used as air-conditioning coolant, precautions concerning HFC leakage prevention and recovery)
	Maintenance and inspection	Maintenance and inspection conditions (inspection frequency, etc.)
	Warranty system	Warranty conditions (scope and content of repair and replacement), warranty period

[Certification Procedures]

The applicant should fill in required information on the attached certificate and submit the relevant information disclosure portion (text is acceptable).

(13) In manufacturing the applied product, related environmental laws and regulations and pollution control agreement (hereinafter referred to as the “Environmental Laws, etc.”) must be followed with respect to air pollution, water contamination, noise, offensive odor, and emission of hazardous materials in the area where the plant performing the final manufacturing process is located.

In addition, the state of compliance with the Environmental Laws, etc. for the last five years from the date of application (whether there is any violation) must be reported. If there is any violation, it is necessary that proper remedies and preventive measures have been already taken, and the related Environmental Laws, etc. must thereafter be followed appropriately.

[Certification Procedure]

With respect to the compliance with the Environmental Laws, etc. in the area where the plant performing the final manufacturing process is located, a certificate issued by the representative of the business of manufacturing the applied product or the manager of the relevant plant (entry or attachment of the list of names of the Environmental Laws, etc.) must be submitted.

In addition, it is necessary to report whether there is any violation during the last five years, including a violation subject to administrative punishment or

administrative guidance, and if there is, the following documents in a and b must be submitted:

- a. With respect to the fact of violation, guidance documents from administrative agencies (including order of correction and warning) and copies of written answers (including those reporting causes and results of correction) to such documents (making a series of progress clear);
- b. Following materials (copies of recording documents, and so on) concerning the management system for compliance with the Environmental Laws, etc. in 1)-5):
 - 1) List of the Environmental Laws, etc. related to the area where the plant is located;
 - 2) Implementation system (organizational chart with entry of roles, etc.);
 - 3) Document stipulating retention of recording documents;
 - 4) Recurrence prevention measures (future preventive measures);
 - 5) State of implementation based on recurrence prevention measures (result of checking of the state of compliance, including the result of onsite inspection).

4-2. Criteria for Material and Certification Procedures

(14) The system shall conform to the requirements of “High-quality Solar System Certification System” implemented by Solar System Development Association.

[Certification Procedures]

The applicant should fill in required information on the attached certificate and submit a copy of the certificate of “High-quality Solar System Certificate System” issued by Solar System Development Association.

5. Considerations

In the process of manufacturing products, it is desirable to consider the following items, although they are not requirements for certification. Compliance with each item shall be indicated in the Attached Certificate

(1) There is a system for recovering the used system equipment and recycling the recovered equipment.

6. Application unit, indication of Eco Mark, etc.

Omitted.

October 1, 2013	Established (Version 1.0)
September 30, 2020	Expiration

The Certification Criteria for the Product Category will be revised when necessary.