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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 19141-2026

Replacing GB/T 19141-2011

Specification for domestic solar water heating systems

家用太阳能热水系统技术条件

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Foreword

The symbols given in GB/T 18708 and the following symbols are applicable to this document. Ac contour lighting area measurement, m

1 Scope

GB/T 19141-2026 is the Chinese national standard covering the household solar water heater - the collector and tank, the thermal performance over a day, the freeze and overheat protection, the water quality and the mounting that has to survive wind on a roof.

China has more of these installed than the rest of the world combined. It replaces GB/T 19141-2011 and has been in force since 1 August 2026. It was issued on 30 April 2026 and has been in force since 1 August 2026, replacing GB/T 19141-2011. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

2 C_{pw} is the specific heat capacity of water, in $J/(kg \cdot ^\circ C)$. H Daily solar irradiance, MJ/m^2 m Hot water tank capacity (kg) q During the test, the daily usable heat gain per unit outline light-receiving area of the household solar water heating system, in MJ/m

2 When the daily solar irradiance is $17 MJ/m^2$, the daily usable heat gain per unit area of a household solar water heating system is [data missing]. Quantity, MJ/m

2 When the daily solar irradiance is $17 MJ/m^2$, the daily usable heat gain per unit area of a household solar water heating system is [data missing]. Amount, kWh/m^2 t_b The water temperature in the hot water storage tank at the start of the heat collection test, in $^\circ C$. The water temperature in the hot water storage tank at the end of the heat collection test, in $^\circ C$. The final water temperature in the hot water storage tank during the t_f heat loss test, in $^\circ C$. t_i Initial water temperature in the hot water storage tank during the heat loss test, in $^\circ C$. t_a is the air temperature near the hot water storage tank, in $^\circ C$. When the solar irradiance on day t_{17} is $17 MJ/m^2$, the final water temperature of the hot water storage tank is $^\circ C$. Average heat loss factor of USL residential solar water heating systems, $W/(m^3 \cdot K)$ V . Measured water volume in the hot water storage tank, m^3 V

1 Nominal water capacity of the hot water storage tank, m^3 ν Ambient air velocity, m/s ρ_w is the density of water, in kg/m^3 . ΔA_c is the deviation rate between the nominal and measured values of the profile lighting area, dimensionless. ΔV is the deviation rate between the nominal and measured values of the hot water storage tank capacity, dimensionless. $\Delta \tau$ is the time interval, in seconds. (av) Parameter average

Note. (av) is a subscript.

5 Product Classification and Labeling

5.1 Product Classification The classification of household solar water heating systems shall be in accordance with GB/T 18708.

5.2 Product Marking

5.2.1 Marked Content The product marking of a household solar water heating system consists of the following six parts, separated by "-", as shown in Figure 2.

5.2.2 Tagging Example The following is an example of product labeling for a residential

solar water heating system.

a) A compact, direct-type system using an all-glass vacuum tube, with the heat transfer medium inside the glass tube, rated water capacity of 150L, and a contoured light-transmitting area. Taking a household solar water heating system with a capacity of 2.00m^2 , a rated working pressure of 0.05MPa for heat storage, and a serial number of 1 as an example, the following is a notation.

b) Using a flat plate, with the heat transfer medium inside a metal tube, a separate, indirect type, with a rated water capacity of 100L and a contour lighting area of 1.80m^2 . Taking a household solar water heating system with a rated working pressure of

0.6 MPa and serial number 1 as an example, it is marked as follows:

6.1 Components

6.1.1 Solar collectors Flat-plate solar collectors used in domestic solar water heating systems should meet the requirements of GB/T 6424; evacuated tube solar collectors... The heater should meet the requirements of GB/T 17581.

6.1.2 Vacuum Solar Collector Tube All-glass vacuum solar collector tubes should meet the requirements of GB/T 17049; glass-metal sealed heat pipe vacuum solar collector tubes should meet the requirements of GB/T 17049. The requirements of GB/T 19775 shall apply; all-glass heat pipe vacuum solar collectors shall comply with the requirements of GB/T 26975.

6.1.3 Pipelines The insulation of pipelines should comply with the requirements of GB/T 4272. If self-regulating electric heating tape is used for the pipeline, its performance should comply with GB/T 19835. Requirements.

6.1.4 Circulation Pump The circulating pump shall meet the requirements of GB/T 4706.66.

6.1.5 Heat Exchanger The heat exchanger should have good compatibility with the heat transfer medium and should not pollute the water, such as the hardness of the water in a household solar water heating system. In areas where the water temperature exceeds 60°C after being heated by a hot water system, a water softening system should be installed, and the system's instruction manual should specify regular cleaning procedures. The content.

6.1.6 Controller The controller used in a household solar water heating system should comply with the requirements of GB/T 23888.

6.1.7 Exhaust valve The pressure rating, temperature resistance, exhaust speed, and compatibility with the heat transfer medium of the exhaust valve should meet the system requirements.

6.1.8 Expansion Tank The materials used in the expansion tank components of a domestic solar water heating system should be compatible with the heat transfer medium, and the

pre-charge pressure of the expansion tank should be compatible with the system's static pressure. The expansion tank should be compatible with the system's operating temperature, and its temperature resistance should be adapted to the pressure requirements.

6.2 Resistance to external influences

6.2.1 Weather resistance All components of a residential solar water heating system exposed outdoors should have good weather resistance, enabling the system to withstand the extreme temperatures of the location of use. It should be designed for use in warm and low temperature environments, and its service life should not be less than 10 years.

6.2.2 Wind resistance The outdoor portion of a residential solar water heating system should have reliable wind-resistant measures, which should be clearly described in the product manual.

6.2.3 Lightning Protection When a residential solar water heating system is installed outside the protection zone of a building's lightning protection system, additional measures should be taken in accordance with the provisions of GB 50057. Lightning protection measures should be implemented.

7.1 Appearance

7.1.1 The transparent cover of the flat-plate solar collector used in the system should be free from cracks; the all-glass vacuum solar collector tube should comply with GB/T 17049. The glass tubes of glass-metal sealed heat pipe vacuum solar collectors should meet the requirements of GB/T 19775. All-glass heat pipe vacuum... Solar collector tubes should meet the requirements of GB/T 26975.

7.1.2 The color of the heat absorber coating should be uniform, without peeling, cracking, or flaking.

7.1.3 The external surface of the hot water storage tank of a household solar water heating system should be flat and free from scratches, dirt and other defects.

7.1.4 The deviation between the nominal outline lighting area and the actual outline lighting area should be within $\pm 3.0\%$.

7.1.5 Domestic solar water heating systems should have a clear and indelible label in a prominent location. The product label should include the following.

- a) Manufacturer;
- b) Product Name;
- d) Product model;
- e) Outline lighting area;