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Technical code for solar heating system

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1 General

1.0.1 This standard is formulated in order to standardize the design, construction, acceptance and evaluation of solar heating projects, make solar heating projects safe and applicable, economical and reasonable, advanced and reliable, and improve project quality.

1.0.2 This standard applies to the use of solar heating and heating in newly built, expanded and rebuilt buildings, as well as the addition or renovation of solar heating and heating facilities and system engineering design, construction, acceptance and evaluation of existing buildings.

1.0.3 The solar heating system should be included in the construction management of construction projects, and should be planned, designed, constructed, checked and accepted in a unified manner, and put into use at the same time.

1.0.4 The solar heating system should be comprehensively utilized throughout the year. During the non-heating period, it should supply domestic hot water, summer refrigeration and air conditioning or other heat according to demand.

1.0.5 When adding or renovating solar heating systems in existing buildings, the building structure safety review should be carried out and the safety requirements should be met.

1.0.6 It is advisable to carry out building energy-saving renovation for existing buildings with solar heating systems.

1.0.7 Energy saving and environmental protection benefit analysis and evaluation should be

carried out for solar heating and heating projects.

1.0.8 The design, construction, acceptance and evaluation of solar heating projects shall not only comply with this standard, but also comply with the current relevant national standards.

2.0.1 Solar heating

Convert solar energy into heat energy to meet certain heating needs of buildings in winter, or supply buildings with winter heating and other heat throughout the year, which can be divided into passive solar heating and solar heating heating systems.

2.0.2 passive solar heating

Through the reasonable selection and treatment of building orientation and surrounding environment layout, building internal and external space layout, building materials, and envelope structure, the building itself can collect, store and distribute solar heat in winter, and shield solar radiation and dissipation in summer. Function of indoor heat.

2.0.3 solar heating system

Set up special equipment such as solar collectors, and provide heating for buildings in winter and other heat throughout the year through circulation pipelines.

2.0.4 solar thermal combined heat and power generation system

A system that converts solar energy into thermal energy, generates electricity through the thermal power conversion process, and uses waste heat for heating.

2.0.5 Solar heating system with short-term heat storage

The heat storage device can store the heat obtained from the sun for several days in a solar heating and heating system.

2.0.6 Solar heating system with seasonal heat storage

The thermal storage device can store the solar energy heat gained from the sun in the non-heating season.

2.0.7 solar liquid collector

A device that absorbs solar radiation and transfers the generated heat energy to a liquid heat transfer medium.

2.0.8 solar air collector

A device that absorbs solar radiation and transfers the generated heat energy to the air heat transfer medium.

2.0.9 solar collector system

A system that collects solar energy and converts it into thermal energy that is transferred to a heat storage device.

2.0.10 direct solar heat collection system solar direct system

The heated working fluid in the solar heat collector is directly supplied to the user's solar heat collection system.

2.0.11 solar indirect system

The heat transfer working medium is heated in the solar collector, and then the heat transfer working medium is heated by the heat exchanger to supply the user's solar heat collection system with water.

2.0.12 Closed solar heat collection system solar closed system

The solar heat collection system in which the heat transfer medium in the heat collection system is not connected to the atmosphere.

2.0.13 drain down system

When the working medium may be frozen, all the working medium can be emptied to prevent the direct solar heat collection system from freezing damage.

2.0.14 drain back system

When the working medium may be frozen, all the working medium can be discharged back to the indoor liquid storage tank to prevent the indirect solar heat collection system from freezing damage.

2.0.15 antifreeze system antifreeze system

A solar heat collection system that uses antifreeze as a heat transfer medium to prevent freezing damage.

2.0.16 freeze-proofing system with circulation

A solar heat collection system that prevents freezing damage through working medium circulation.

2.0.17 efficiency of solar collector system

The ratio of the heat gain of a solar thermal collection system to the total solar radiation incident on the total area of the system collectors during a specified period of time.

2.0.18 The ratio of electricity consumption to transferred heat quantity for solar collector system

Under design conditions, the ratio of the total power consumption of the circulating water pump or fan of the solar thermal collection system to the heat gain of the solar thermal collection system.

2.0.19 Solar fraction

The percentage of heat supplied by solar energy in the solar heating system to the design load of the solar collector system.

2.0.20 cost-benefit ratio of the system

The ratio of the increased investment of the solar heating system to the total energy saving of the system during the normal service life indicates the investment cost per kWh of conventional energy heat saved by using solar energy.

2.0.21 heat consumption of building

Under the condition of calculating the average outdoor air temperature during the heating period, in order to maintain the calculated indoor design temperature, the heat consumed by the building within a unit time must be supplied by indoor heating facilities.

2.0.22 Building heating design heat load heating load for space heating of building

Under the condition of the calculated temperature outside the heating, in order to maintain the calculated temperature of the indoor design, the heat consumed by the building in a unit time and needs to be supplied by the heating facility.

2.0.23 gross collector area

The maximum projected area of the entire collector, excluding those components that fix and connect the heat transfer pipes.

3.1 General provisions

3.1.1 The application of solar heating technology in new buildings should follow the principles of passive technology priority and active system optimization.