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

GB/T 17581-2021

Replacing GB/T 17581-2007

Evacuated tube solar collectors

真空管型太阳能集热器

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Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules of Standardization Documents" drafted: This document replaces GB/T 17581-2007 "Evacuated Tube Solar Collectors": Compared with GB/T 17581-2007, except for structural adjustment In addition to the adjustment and editorial changes, the main technical changes are as follows:

- a) The definitions, technical requirements and test methods of medium temperature efficiency and medium temperature power are added (see 3:1, 3:2, 6:2:13, 7:14);
- b) The recommended structural dimensions of the evacuated tube solar collectors have been changed (see 5:1:3, Appendix B, 5:1:3 and Appendix B of the:2007 edition);
- c) Changed the marking of evacuated tube solar collectors (see 5:2, 5:2 of the:2007 edition);
- d) Added technical requirements for all-glass vacuum solar collector built-in metal heat pipes with fins (see 6:1:3);
- e) Added technical requirements for all-glass heat pipe vacuum solar collectors (see 6:1:4);
- f) Added technical requirements for medium temperature all-glass vacuum solar collectors (see 6:1:5);
- g) Changed the technical requirements for heat-resistant temperature and environmental protection of thermal insulation materials (see 6:1:8, 6:1:9, 6:1:5 of the:2007 edition);
- h) Added the technical requirements and test methods for the deviation of the nominal daylighting area for the appearance test of the vacuum tube type solar collector (see 6:2:1, 7:2);
- i) The strength is deleted (see 6:2:4 and 7:5 of the:2007 edition), and the technical requirements and test methods for mechanical load are added (see 6:2:4 and 7:5);
- j) Added technical requirements and test methods for standard stagnation temperature of vacuum tube solar collectors (see 6:2:6, 7:8);

k) Added technical requirements and test methods for the maximum working temperature of vacuum tube solar collectors (see 6:2:12, 7:13);

l) Changed the technical requirements and test methods for the thermal performance of vacuum tube solar collectors (see 6:2:13, 7:14,:2007 edition 6:2:11, 7:12);

m) Changed the technical requirements and test methods for impact resistance of vacuum tube solar collectors (see 6:2:15, 7:16,:2007 edition of 6:2:13, 7:14);

1 Scope

GB/T 17581-2021 is the Chinese national standard on evacuated tube solar collectors, in the field of energy and heat transfer engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 31 December 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 July 2022. Classification: ICS 27.160, CCS F12. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the symbols and units, product classification and marking, technical requirements, test methods, inspection rules, signs, packaging, transportation, storage and inspection reports: This document is applicable to all-glass vacuum tube solar collectors, glass-metal junctions, all-glass vacuum tube solar collectors, which are heated by solar radiation and the heat transfer working medium is liquid: The vacuum tube type solar collector and the heat pipe type vacuum tube type solar collector are constructed:

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, dated citations documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document:

GB/T 191 Graphical signs of packaging, storage and transportation

GB/T 1800:1-2020 Product Geometric Specifications (GPS) Linear Dimension Tolerance ISO Code System Part 1: Tolerances, Basis of Deviation and Fit

GB/T 4271 Test method for thermal performance of solar collectors

GB/T 6424 Flat-plate solar collector GB/T 12467:

3 Quality requirements for fusion welding of metallic materials Part 3: General quality requirements

GB/T 12936 Terms for Solar Thermal Utilization

GB/T 13384 General technical conditions for packaging of mechanical and electrical products

GB/T 17049 All-glass vacuum solar collector tube

GB/T 19775 Glass-metal sealed heat pipe vacuum solar collector

GB/T 26975 All-glass heat pipe vacuum solar collector tube

GB/T 28738 All-glass vacuum solar collector tube built-in metal heat pipe with fins

GB/T 33297 Medium temperature (100°C~150°C) all-glass vacuum solar collector tubes

3 Terms and Definitions

The terms and definitions defined in GB/T 4271, GB/T 6424, GB/T 12936 and GB/T 33297 and the following terms and definitions apply to this document: 3:1

medium temperature efficiency The total irradiance on the lighting surface of the collector is 1000W/m², the working temperature of the collector is in the range of 100°C~150°C, and the collector is flat: When the temperature difference between the average temperature and the ambient air temperature is 100 °C, the efficiency value of the solar collector is based on the instantaneous efficiency of the collector based on the lighting area: calculated by the rate equation: 3:2 **medium temperature power** The total irradiance on the lighting surface of the collector is 1000W/m², the working temperature of the collector is in the range of 100°C~150°C, and the collector is flat: