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GB/T 44800-2024

**Technical requirements for thermal energy storage media and
heat transfer fluid of solar thermal power plants - Molten salt**

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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 for standardization documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Electricity Council. This document is under the jurisdiction of the National Technical Committee for Standardization of Solar Thermal Power Generation (SAC/TC565). This document was drafted by: Zhejiang Gaosheng Solar Thermal Power Generation Technology Research Institute Co., Ltd., Beijing University of Technology, Zhejiang Kesheng Technology Co., Ltd. Company, CGN Wind Power Co., Ltd., and North China Electric Power University. The main drafters of this document are. Zhang Haobin, Mi Xiaoling, Wu Yuting, Zhang Cancan, Lu Yuanwei, Huang Qi, Sun Feng, Wang Yina, Zhou Kai, Wu Siyuan, Jin Jianxiang, Xu Neng, Wang Qiang, Tang Xianyou, Che Sheng, Yin Hang, Zhao Xiong, and Xu Chao. Solar thermal power station heat storage/heat transfer work Medium technology requirements Molten salt

1 Scope

GB/T 44800-2024 sets the technical requirements for the molten salt used as heat transfer and storage medium in solar thermal power plants. Molten salt is what makes concentrated solar power dispatchable: a tank of hot nitrate salt lets a plant generate through the evening, which is the only reason CSP competes with photovoltaics plus batteries. The salt is also the plant's principal vulnerability, because it freezes at temperatures a winter night can reach, degrades above its decomposition point, and attacks the steel it is contained in, so its purity specification is a plant availability question. The standard sets the technical requirements and the test methods, the inspection rules and the packaging, transport and

storage provisions, with normative annexes giving the determination of the melting point, the decomposition temperature, the specific heat capacity and the density, and the molten salt corrosion performance test. It took effect on 26 October 2024.

This document specifies the technical requirements, inspection rules, packaging, transportation and storage of molten salt as a sensible heat storage/heat transfer medium for solar thermal power plants. The corresponding test methods are described. This document is applicable to the inspection, operation and maintenance of solar thermal power stations with molten salt as the sensible heat storage/heat transfer medium, and other For reference use in systems using heat transfer and heat storage media.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 6425 Thermal Analysis Terminology

GB/T 6678 General Principles for Sampling of Chemical Products

GB/T 8170 Rules for rounding off values and expression and determination of limit values

GB/T 9174 General technical requirements for transport packaging of general goods

GB/T 10247 Viscosity measurement method

GB 12463 General Technical Requirements for Transport Packaging of Dangerous Goods

GB 15603 General Rules for the Storage of Hazardous Chemicals in Warehouses

GB/T 22588 Flash method for measuring thermal diffusivity or thermal conductivity

GB/T 40104 Terminology for Solar Thermal Power Stations

3 Terms and Definitions

The terms and definitions defined in GB/T 6425 and GB/T 40104 apply to this document.

4 Technical Requirements

4.1 Operating temperature The maximum operating temperature of molten salt for solar thermal power generation should be at least 30°C lower than the decomposition temperature, and the minimum operating temperature should be 50°C higher than the melting point. above.

Note. Operating temperature refers to the operating temperature at which the various properties of molten salt in the solar thermal power generation system remain stable.

4.2 Flow performance Within the operating temperature range, the dynamic viscosity of the molten salt should meet the technical requirements of equipment such as molten salt pumps and molten salt heat exchangers.

4.3 Heat transfer performance Within the operating temperature range, the thermal conductivity of the molten salt should be greater than $0.2\text{W}/(\text{m}\cdot\text{K})$.