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

GB/T 11833-2014

Replacing GB 11833-1989

**Determination of steady-state thermal transmission properties
of thermal insulation-Spherical method**

绝热材料稳态传热性质的测定 圆球法

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Quarantine of the People's Republic of China;
Standardization Administration of China**

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Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules. This standard replaces GB/T 11833-1989 "steady-state heat transfer properties of the insulation measuring sphere Law", in addition to the main editorial changes of outer To technical changes are as follows:

- Removed some terms (see Chapter 3);
- Increased "should be considered to calculate the apparent thermal conductivity of the support tube heat transfer influence" (see Chapter 4);
- An increase of less than half the difference between the particle diameter and the inner diameter of the outer sphere within a sphere with an outer diameter of the test piece "20 times is appropriate." (See 5.1.1);
- Modify the sensitivity and accuracy requirements for temperature and the temperature difference measurement system (see 5.1.5.2);
- The maximum particle size of the material being tested was changed to "should be less than one-tenth the thickness of the sample" (see 6.2);
- Revised "Appendix A thermocouple tolerance and type" part. The standard proposed by China Building Materials Federation. This standard by the National Standardization Technical Committee heat insulating material (SAC/TC191) centralized. This standard is drafted by: Building Materials Research and Design Institute of Henan limited liability company. The main drafters. Zhang Liping, Zhang Maoliang, Zhang Zhou, Xu Yuansheng, PROJECTILES, white Zhaojun. This standard replaces the standards previously issued as follows:
 - GB/T 11833-1989. Thermal insulation - Determination of steady heat transfer properties of ball method

1 Scope

GB/T 11833-2014 is the Chinese national standard on determination of steady-state thermal transmission properties of thermal insulation-spherical method, in the field of

construction materials and building. 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 24 June 2014 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 February 2015. Classification: ICS 91.120.10, CCS Q25. 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 standard specifies the use of the ball device for measuring the particulate or powdered material properties of steady-state heat transfer method. This standard applies to the apparent thermal conductivity in the range of (

0.02 to 1.00) Determination of $W/(m \cdot K)$ heat transfer properties of the dried material.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 4132 insulation materials and related terms

3 Terms and Definitions

GB/T 4132 defined by the following terms and definitions apply to this document.

3.1 Sample testsample The material being tested by the method specified in the standard sample, measured and reduced to slightly larger than the required number of samples.

3.2 Specimen testspecimen Sample means for measuring the load measurement. Principle

4 Ball ball inside heat transfer means by the heat and cooling the outer sphere concentrically arranged, whose structure shown in Figure 1. Inner and outer ball temperature stability , The heat flow inside the ball Q emitted radially spread outside the ball through the test piece, measured heating power inside the ball, the ball and the temperature of the outer surface of the inner surface of the outer sphere And the geometry of the sphere, according to equation (1) to calculate the apparent thermal conductivity of the material being tested. $\lambda_{\alpha} = \frac{Q}{A} \frac{D_2 - D_1}{D_2 \times D_1 \times 2\pi} \frac{1}{T_1 - T_2}$ (1) Where. The apparent thermal conductivity of the material being tested λ_{α}

--- watts per meter per Kelvin open $[W/(m \cdot K)]$; Q

--- heat flux emitted inside the ball, is numerically equal to the electric power applied to the

inner ball on the heat in watts (W); D1

--- inner sphere diameter, in meters (m); D2

--- ball outside diameter, in meters (m); T1

--- inner sphere outer surface temperature, in degrees Kelvin (K); T2

--- outer spherical surface temperature in Kelvin (K). To reduce measurement errors, calculate the apparent thermal conductivity of the support tube should be considered in the impact of heat transfer.