

ICS 91.100.60

CCS Q 25



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

GB/T 45012-2024

**Thermal insulating products for industrial installations -
Determination of the coefficient of linear thermal expansion at
sub-ambient temperatures**

工业用绝热制品 低温线性热膨胀系数的测定

(English Translation)

Issued on: November 28, 2024

Implemented on: June 1, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

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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 is required.

This document is equivalent to ISO 23766:2022 "Industrial thermal insulation products - Determination of low-temperature linear thermal expansion coefficient".

1 Scope

This document specifies the equipment and procedures for determining the coefficient of linear thermal expansion of thermal insulation products at low temperatures (-196 °C ~ 25 °C).

possible temperature limits.

This document is not applicable to products that undergo irreversible dimensional changes due to water or phase changes during the test.

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.

in this document.

ISO 9229 Thermal insulation - Vocabulary Note. GB/T 4132-2023 Thermal insulation terminology (ISO 9229:2020, IDT) ISO 18099 Thermal insulating products for building equipment and industrial installations - Determination of coefficient of thermal expansion for building equipment and industrial installations-Determination of the coefficient of thermal expansion) Note. GB/T 34183-2017 Determination of thermal expansion coefficient of thermal insulation products for building equipment and industrial installations (ISO 18099.:2013, IDT)

3 Terms and definitions

For the purpose of this document, the terms and definitions defined in ISO 9229 and ISO 18099 and the following apply.

Sub-ambient temperature the temperature range is from -196 °C to 25 °C. Insulation products are used in this temperature range to reduce heat flow.

4.1 Principle

As the temperature changes, the linear dimensions of the product change, which can be tested and characterized by optical testing methods (see Figure 1 for an example).