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

GB/T 46436-2025

**Vitreous and porcelain enamels - Preparation of samples and
determination of thermal expansion coefficient**

搪瓷制品和瓷釉 样品制备和热膨胀系数的测定

(English Translation)

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Table of Contents

Foreword
1 Scope
2 Normative references
3 Terms and Definitions
4 Instruments and Equipment
5 Sample Requirements
6 Sample Preparation
6.1 General Rules

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is modified to adopt ISO 20274:2017 "Preparation of enamel articles and enamel samples and determination of coefficient of thermal expansion".

The technical differences between this document and ISO 20274:2017, and the reasons therefor, are as follows.

a) ISO 19496-1 (see Chapter 3) has been replaced with the normatively referenced GB/T 7410 to adapt to my country's technical conditions and to add [further details needed].

Operability;

b) ISO 7991 has been replaced with the normatively referenced GB/T 16920 (see 4.1, Chapters 7 and 8) to adapt to my country's technical requirements.

Add components to increase operability;

c) The content of the test report (see Chapter 9) has been revised to adapt to my country's technical conditions and increase operability.

The following editorial changes have been made to this document.

---Notes 1 and 3 in section 6.3 of ISO 20274:2017 have been deleted (see section 6.3);

---Notes 1 and 2 in Chapter 7 of ISO 20274:2017 have been deleted (see Chapter 7);

---The example description in Chapter 8 of ISO 20274:2017 has been modified (see

Chapter 8).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Metallic and Non-metallic Coatings (SAC/TC57).

1 Scope

This document describes the preparation of enamel samples and the testing methods used to test the coefficient of thermal expansion.

This document applies to the determination of the coefficient of thermal expansion of enamel glaze.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 7410 Terminology for Enamel GB/T 16920 Determination of the average linear thermal expansion coefficient of glass (GB/T 16920-2015, ISO 7991:1987, NEQ)

3 Terms and Definitions

The terms and definitions defined in GB/T 7410 apply to this document.

4 Instruments and Equipment

4.1

Thermal expansion coefficient tester. conforms to the requirements of GB/T 16920.

Note: Optical dilatometers can be used as an alternative to push rod dilatometers.

4.2

Casting mold. made of ceramic, such as corundum, porcelain boat, or metal (such as tool steel) (see Appendix A).

4.3

Melting crucible. made of non-polluting materials, such as corundum, porcelain, etc., approximately 55mm high and 40mm in diameter.

4.4

Laboratory high-temperature furnace. Temperature control accuracy $\pm 5^{\circ}\text{C}$ within the temperature range of $800^{\circ}\text{C}\sim 1100^{\circ}\text{C}$.

5 Sample Requirements

The sample size should meet the requirements of the thermal expansion coefficient tester and the reference sample used.

The sample should be a straight rod-shaped specimen with a cross-section that is approximately circular or square, and its diameter or side length should be within the entire sample.

The length of the product should remain constant within its range, with a deviation not exceeding $\pm 1\text{mm}$.

The deviation between the diameter or side length of the sample cross section and the diameter or side length of the reference sample should not exceed $\pm 1\text{ mm}$.

The upper and lower surfaces of the sample should be parallel and perpendicular to the axis, with a maximum deviation of no more than $\pm 3^{\circ}$.

The initial length of the sample should deviate from the initial length of the reference sample by no more than $\pm 0.5\text{ mm}$.

6.1 General Rules

The sample should be annealed to relieve stress so that there will be no downward fluctuations in the test curve when measuring the coefficient of thermal expansion.