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

GB/T 16535-2008

Replacing GB/T 16535-1996

**Fine ceramics (advanced ceramics, advanced technical
ceramics) -- Test method for linear thermal expansion of
monolithic ceramics by push-rod technique**

精细陶瓷线热膨胀系数试验方法 顶杆法

(English Translation)

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Table of Contents

Foreword

1 Scope

2 Normative references

3 Terms and Definitions

Foreword

This revised standard adopts ISO 17562:2001 "Fine ceramics (advanced ceramics, advanced technical ceramics) --- linear thermal expansion of monolithic ceramics department Number of test methods for mandrel Law "(in English).

This standard adopts ISO 17562:2001, the made the following technical corrections.

- a) expanding the use of the standard range, allowing "other inorganic non-metallic materials can also refer to use";
- b) a reference to the standard ISO 3611 and ISO 6906 changed to refer to GB/T 1216 and GB/T 21389;
- c) To delete references to standards ISO 7991 and IEC 60584-1;
- d) 10.2 Calibration of the instrument to "comply with GB/T 1216 requirements micrometer";
- e) Added Appendix A of the linear thermal expansion coefficient of alumina reference data and corresponding references.

This standard also made the following editorial changes.

- a) with a decimal point '. 'Instead of a comma as the decimal point,' ';
- b) Remove the preface international standards;
- d) 5.6 to delete the note at the original duplicate;
- e) Modify the format of Table 1, making it easier to understand.

This standard replaces GB/T 16535-1996 "ceramic works linear thermal expansion coefficient test methods." this standard and GB/T 16535-1996 compared to the main changes are as follows.

- a) the heading "Engineering Ceramics" to "fine ceramics";
- b) Temperature range increases to "near liquid nitrogen temperature to a maximum temperature range of 1500 °C" (see 1);

- c) increasing the normative references (see 2);
- d) increase the "Terms and definitions" (see 3);
- e) the expected increase in the value of the uncertainty (see 8);
- f) increase the instrument calibration (see 10);
- g) Increase Appendix A, Appendix B and Appendix C.

The Standard Appendix A and Appendix B is a normative appendix Appendix C are informative appendices.

The standard proposed by China Building Materials Federation.

This standard by the National Ceramic Industry Standardization Technical Committee.

1 Scope

This standard specifies the test in the range of 1500 °C fine ceramic wire and the thermal expansion coefficient of linear thermal expansion coefficient from near liquid nitrogen temperature to a maximum temperature Principle of test methods, equipment, samples, test procedures and results of calculations.

This standard applies to bulk fine ceramics, other inorganic non-metallic materials may also be reference.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard. However, according to research encourages the parties to the agreement Study whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 1216 outside micrometer GB/T 16839.1-1997 Thermocouples - Part 1. indexing table (IEC 584-1:1995, IDT) GB/T 21389 cursor, with table and several Caliper

3 Terms and Definitions

The following terms and definitions apply to this standard.

At a temperature between T1 and T2 is linear coefficient of thermal expansion $\Delta L/L_0$.

Where. $\Delta L = (L_2 - L_1)$, L_0 is the length of the sample at room temperature.

Note: Suppose when the temperature changed from T1 to T2, the length of the sample changed from L1 to L2.

Jade α

Average heat at a temperature between T_1 and T_2 expansion coefficient α of jade $\Delta L / (L_0 \times \Delta T)$, where. $\Delta T = (T_2 - T_1)$.

Instantaneous linear thermal expansion coefficient α is close to T_2 average linear thermal expansion coefficient of the time T_1 , that is. $\alpha = \lim_{T_2 \rightarrow T_1} \Delta L / \Delta T$

Principle 4

Under certain atmosphere, a small load is applied to the sample of known dimensions, certain ramp rate of heating or cooling the sample to set Given temperature, measuring the change in length of the specimen, record temperature changes, the sample is calculated linear thermal expansion coefficient and transient linear thermal expansion specific temperature coefficient.