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

GB/T 43873-2024

**Test method for upper and lower limit annealing temperatures
of ultra-thin glass**

超薄玻璃退火上下限温度试验方法

(English Translation)

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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:

This document refers to ISO 7884-3:1987 "Glass viscosity and viscosity fixed points Part 3: Determination of viscosity using a fiber extension viscometer" Drafting, the degree of consistency is non-equivalent:

1 Scope

This document specifies the principle, test device, sample preparation, test steps, data processing and result table of the upper and lower limit temperatures of ultra-thin glass annealing:

Demonstration and test report:

This document is applicable to the measurement of upper and lower annealing temperature limits of ultra-thin glass, and other forms of glass shall be implemented for reference:

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 4167 Weights

GB/T 21389 Vernier, dial and digital calipers GB/T 28857 DC differential transformer displacement sensor

3 Terms and definitions

The following terms and definitions apply to this document:

The temperature value at which 95% of the thermal stress of glass materials or products is eliminated in a short period of time:

Note: Generally, the corresponding glass viscosity value is 10^{13} dPa·s, also known as the annealing point temperature, denoted as T_a :

The temperature value corresponding to the elimination of 5% thermal stress of glass materials or products in a short period of time:

Note: Generally, the corresponding glass viscosity value is $10^{14.5}$ dPa·s, also known as the strain point temperature, denoted as T_{st} :

4 Principle

When a cylindrical glass fiber sample is heated locally or as a whole under vertical load, it will produce viscous elongation within the annealing range:

The relationship between the sample elongation rate and the sample diameter, load mass and viscosity conforms to formula (1):

Substituting the corresponding viscosity value into formula (1) can obtain the corresponding elongation speed: By taking the logarithm of the elongation speed and plotting the temperature curve, the final determination is Set the upper annealing temperature and the lower annealing temperature:

$dL/dt =$

$\frac{8mgL}{\pi d^2 \eta}$

$\times 10^5$ (1)

Where:

η --- Viscosity value, unit is deciPascal second (dPa·s);

m --- load mass, in grams (g);