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ICS 31.030
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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 45505.3-2025

Test method of flat panel display glass substrate - Part 3: Thermal properties

平板显示器基板玻璃测试方法 第3部分：热学性能

Issued on: August 1, 2025 **Implemented on: February 1, 2026**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

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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 is Part 3 of GB/T 45505 "Test methods for glass substrates for flat panel displays". Lower part.

- Part 1: Appearance and geometry;

- Part 2: Surface properties;

- Part 3: Thermal properties;

- Part 4: Mechanical properties;

- Part 5: Optoelectronic properties.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document was proposed and coordinated by the National Technical Committee for Semiconductor Equipment and Materials Standardization (SAC/TC203).

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Introduction

Flat panel display substrate glass is a key strategic material in the electronic information display industry. The quality of substrate glass is closely related to the resolution and transparency of the finished panel.

Brightness, thickness, weight, viewing angle and other indicators are closely related, representing the highest level in the field of modern glass large-scale manufacturing in the world.

As substrate glass continues to become higher definition, larger size, and ultra-thin, the quality requirements for display substrate glass are increasing year by year.

Appearance, length and width dimensions and deviations, thickness deviation, thickness difference, edge shape, cutting angle deviation, positioning angle deviation, right angle, deflection, warping, Surface roughness, waviness, annealing point, strain point, softening point, average linear thermal expansion coefficient, thermal conductivity, reheat linear shrinkage, density, stress, Young's modulus, shear modulus, Poisson's ratio, Vickers hardness, transmittance, refractive index, volume resistivity, dielectric constant and dielectric loss factor are for flat plates.

These indicators will affect the product quality of flat panel display substrate glass, so it is necessary to establish the Test methods for display substrate glass.

GB/T 45505 aims to provide test methods for various properties of flat panel display

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substrate glass and is intended to consist of five parts.

- Part 1: Appearance and geometric dimensions. The purpose is to provide test methods for the appearance and geometric dimensions of flat panel display substrate glass.

- Part 2: Surface properties. The purpose is to provide a test method for the surface properties of flat panel display substrate glass.

- Part 3: Thermal properties. The purpose is to provide a test method for the thermal properties of flat panel display substrate glass.

- Part 4: Mechanical properties. The purpose is to provide test methods for the mechanical properties of flat panel display substrate glass.

- Part 5: Photoelectric properties. The purpose is to provide test methods for the photoelectric properties of flat panel display substrate glass.

Test methods for flat panel display substrate glass Part 3: Thermal properties

1 Scope

This document describes the annealing point, strain point, softening point, average linear thermal expansion coefficient, thermal conductivity and reheat Method for measuring linear shrinkage.

This document is applicable to the testing of thermal properties of substrate glass for all types of flat panel displays.

2 Normative references

GB/T 1216

GB/T 16920-2015

GB/T 21389

GB/T 38711-2020

GB/T 38712-2020

3 Terms and Definitions

The terms and definitions defined in GB/T 16920-2015, GB/T 38712-2020, GB/T 38711-2020 and the following terms and definitions apply to This document.

3.1 Annealing point

This corresponds to the temperature at which the substrate glass viscosity is 1013 dPa-s.

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3.2 strain point

This corresponds to the temperature at which the substrate glass viscosity is 1014.5 dPa-s.

3.3 softening point

This corresponds to the temperature at which the substrate glass viscosity is 107.6 dPa-s.

3.4 [Source. GB/T 16920-2015, 3.1, with modifications]

The ratio of the change in specimen length within a certain temperature interval to the temperature interval and the initial length of the specimen.

3.5 thermal conductivity

The rate of steady-state heat flow per unit area caused by a unit temperature gradient perpendicular to the surface.

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