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

GB/T 46192.3-2025

**Test methods for liquid crystal alignment layers - Part 3: Optical
and electrical properties**

液晶配向膜测试方法 第3部分：光电性能

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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 Part 3 of GB/T 46192 "Test Methods for Liquid Crystal Alignment Films". GB/T 46192 has already published the following parts.

1. Physical and Chemical Properties;

2. Film-forming properties;

3. Photoelectric properties. 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 and is under the jurisdiction of the National Technical Committee on Standardization of Semiconductor Equipment and Materials (SAC/TC203). This document was drafted by: Shenzhen Dalton Electronic Materials Co., Ltd., China Electronics Technology Standardization Institute, and Changsha Dalton. Electronic Materials Co., Ltd., TCL CSOT Technology Co., Ltd., Nanxiong Yihao Chemical Co., Ltd., Shenzhen Zhengtong Renhe Technology Co., Ltd. The company, Nanjing Jingcui Optical Technology Co., Ltd. The main drafters of this document are. Xu Seqiang, Wu Yiran, Li Jinhua, Zhao Junsha, Nie Yonghui, Cao Kewei, Feng Yanli, Shi Zeyuan, Zhang Baoshuai, and Guo Guihua. Ge Shijun.

Liquid crystal alignment film is an important component of liquid crystal display devices, which has the function of adjusting the alignment direction and distribution of liquid crystal molecules in the liquid crystal display. The effect of intensity. Its effect on liquid crystal displays needs to be characterized using specific testing methods. To meet the needs of my country's development, research, manufacturing, inspection, and import/export trade of liquid crystal alignment film products, this paper formulates liquid crystal alignment film... A series of standards for test methods. GB/T 46192 "Test Methods for Liquid Crystal Alignment Films" is proposed to consist of the following three parts.

1. Physicochemical Properties. This section describes the standard test conditions and

methods for the physicochemical properties of liquid crystal alignment film solutions.

2. Film Formation Performance. This section describes the standard test conditions and methods for assessing the film formation performance of liquid crystal alignment films.

3. Photoelectric Properties. This section describes the standard test conditions and methods for the photoelectric properties of liquid crystal alignment films. Test methods for liquid crystal alignment films Part

1 Scope

GB/T 46192.3-2025 is the Chinese national standard covering the optical and electrical behaviour of the alignment layer - the transmittance and the birefringence it adds, the voltage holding ratio and the residual DC that cause image sticking, and the measurement of each on an assembled test cell. Part 3 of the series, completing it with Parts 1 and 2. First edition, in force from 1 May 2026. Issued on 5 October 2025, it has been in force since 1 May 2026.

This document describes the test methods for the photoelectric properties of liquid crystal alignment films used in liquid crystal displays. This document applies to the research, development, production, testing, and application verification of liquid crystal alignment films for liquid crystal displays.

2 Normative references

This document has no normative references.

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 pretilt angle After triboelectric alignment or photoalignment, the anisotropy of the liquid crystal alignment film causes the liquid crystal molecules to maintain a fixed state with the surface of the liquid crystal alignment film. Fixed angle.

3.2 twist angle The rotation angle by which liquid crystal molecules inside a liquid crystal display cell rotate from a specific axis to another direction.

3.3 Voltage holding ratio The percentage of the integral area of the voltage change curve interval of the liquid crystal display per unit time to the integral area when the voltage is maintained at 100%.

3.4 ion density The amount of charge equivalent to that of mobile ions within a liquid crystal display.

4 Pre-tilt angle, twist angle

4.1 Principle For pretilt angle and torsion angle tests, the liquid crystal test box should be placed on a special optical monitoring device, as shown in Figure

1. The liquid crystal test box is placed... The sample is placed between two polarizers, and the two polarizers are rotated. When the incident light passes through the rotating polarizers and the liquid crystal test cell, due to the liquid crystal... Due to the birefringence effect, the optical probe will monitor the final emitted light signal. The values of the pretilt angle and twist angle are obtained through optical simulation calculations.