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

GB/T 11168-2009

Replacing GB 11168-1989

Image quality of optical systems method of determination

光学系统像质测试方法

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Foreword

This standard replaces GB/T 11168-1989 "Optical system quality test method". The main differences between this standard and GB/T 11168-1989 are. - standardize the reference standard in Chapter 2 of GB/T 11168-1989;

--- the GB/T 11168-1989 Chapter 3, Chapter 4, Chapter 5 and Chapter 6 into the same chapter, the title changed to "quality test side law". Appendix A of this standard is a normative appendix. This standard is proposed by the China Machinery Industry Federation. This standard is nationalized by the National Committee for the Standardization of Optics and Photonics (SAC/TC103). This standard is responsible for drafting units. Shanghai Polytechnic University. This standard participates in the drafting unit. Nanjing Jiangnan Yongxin Optical Co., Ltd., Ningbo Yongxin Optics Co., Ltd., Suzhou Yiguang Instrument Limited company. The main drafters of this standard. Feng Qionghui, Zhang Huixian. This standard replaced the previous version of the standard release.

--- GB/T 11168-1989. Optical system quality test method

1 Scope

GB/T 11168-2009 is the Chinese national standard on image quality of optical systems method of determination, in the field of image technology. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 30 September 2009 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 December 2009. Classification: ICS 37.020, CCS N30. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This standard specifies the test methods used to evaluate the star, resolution, geometric

aberration and wave aberration of the optical system. This standard is applicable to infinity imaging optics systems, far-focus optical systems and limited-distance imaging optics systems for use in visible spectral regions. The use of optical systems for other adjacent spectral regions may be used.

2 Normative reference documents

The terms of the following documents are hereby incorporated by reference into this standard. Whichever is the date of the reference file, which is followed by all (Excluding corrigenda) or revisions do not apply to this standard, however, encourage the parties to reach an agreement under this standard Whether you can use the latest version of these files. For undated references, the latest edition applies to this standard. Photographic Lens - Photographic Resolution Test Specimen Photographic lens resolution test chart JB/T 7473-1994

JB/T 9328-1999 resolution board

3.1 Star point

3.1.1 Principle According to the star point (point light source) after the measured system imaging, in the image plane and image before and after the different sections of the diffraction pattern of light intensity distribution (ie star Like the intensity distribution) to determine the image quality. The light intensity distribution of the ideal optical system on the image plane is the value of the complex amplitude distribution function (referred to as pupil function) Transform the square of the mold. In the case of a circular pupil, the distribution of the light intensity distribution (Airy) is given by (1) and (2). $I = I_0 J_1^2(V) / V^2$ (1) $V = 2\pi \lambda \lambda$ Where. I_0

--- measured by the system of the star point of the center of the diffraction light intensity; J_1

--- 1st order Bessel function; V - complex amplitude distribution function; A - measured system pupil radius; X, y - the coordinates of the geometric image points. Figure 1 shows the intensity distribution of the meridional surface near the ideal image plane according to the diffraction theory. Through the optical axis The diffraction pattern of the diffraction intensity on the cross section (see Fig. 2) should have the same diffraction pattern on the symmetrical cross section before and after the image plane. For optical systems with aberrations, the intensity distribution of the starlike image is different from that of the patch. According to its star point diffraction pattern and image plane attached Nearly different sections of the diffraction pattern changes, you can determine the quality of good or bad.