

ICS 37.020

CCS N35



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

GB/T 10987-2009

Optical systems - Determination of parameters

光学系统 参数的测定

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Foreword

This standard replaces GB/T 10987-1989 "Determination of the optical system parameters." This standard and GB/T 10987-1989 main differences are as follows:

- Remove the GB/T 10987-1989 Chapter 2, "in the title the term" word;
- The GB/T 10987-1989 Chapter 3, Section 4, Chapter 5 and Chapter 6 into the same chapter entitled to "measured parameter";
- Remove the GB/T 10987-1989 Chapter 7. The standard proposed by China Machinery Industry Federation. This standard by the National Standardization Technical Committee photon science and optics (SAC/TC103) centralized. This standard is drafted by: Shanghai Polytechnic University. Participated in the drafting of this standard. Nanjing Jiangnan Yong new Optical Co., Ltd., Ningbo Yongxin Optics Co., Ltd., Suzhou has an optical instrument Limited. The main drafters of this standard. Pingqiong Hui, Zhang Hui Yin. This standard replaces the standards previously issued as follows:
 - GB/T 10987-1989. Determination of the optical system parameters

1 Scope

GB/T 10987-2009 is the Chinese national standard on optical systems - determination of parameters, 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 N35. 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 measurement side of the optical system focal length, field of view, magnification and aperture (relative aperture and the numerical aperture) four optical

parameters Law, the basic requirements of measuring apparatus and measurement. This standard applies to the measurement microscope visible spectrum applications, binoculars and camera, projection, plate lens and other optical parameters.

2 Symbol

- d) was higher y ;
- e) image height y' ;
- f) Field of view angle 2ω ;
- g) the image side field angle $2\omega'$;
- h) magnification microscope objective MO ;
- i) angular magnification γ ;
- j) visual total magnification microscope $MTOTVIS$;
- k) eyepiece magnification ME ;
- l) the entrance pupil diameter D ;
- n) the numerical aperture NA . Parameters measured 3

3.1 focal length

3.1.1 Measurement

3.1.1.1 magnification method (PORRO method) 1, uniform illumination collimator lens focal plane engraved plurality of sets of reticle on, each line corresponds to the objective lens on the reticle Parallel light beam emitted from the collimator, measured by an objective lens in which the image side focal plane imaging, with a cross with a microscope aiming reticle, And moving the microscope along the focal plane, by the length measuring mechanism directly measure its movement value, that is, after the image height y measured lens' focal plane, according to equation (1) meter (1) Can also be used with the aim microscope eyepiece micrometer measured by ocular micrometer to measure the intermediate image plane of the microscope image height y'' , according to the equation (2) (2) 'O MO y Can (2) calculated as a constant term into the equation.