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Replacing GB/T 27668.1-2011

Microscopes - Vocabulary for light microscopy

显微镜 光学显微术术语

(English Translation)

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Foreword

This document complies with the regulations of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Custom drafting.

This document replaces GB/T 27668.1-2011 "Microscopic terminology Part 1: Optical microscopy". With GB/T 27668.1-Compared with 2011, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

---Changed the scope content (see Chapter 1, Chapter 1 of the 2011 edition);

---Added some terms and definitions (see 3.1.7.2, 3.1.44, 3.1.54.6, 3.1.58.3, 3.1.58.3.1, 3.1.58.4, 3.1.87.10.2, 3.1.106.8, 3.1.116, 3.1.116.1, 3.1.128.1, 3.1.128.5, 3.1.139, 3.1.142, 3.2.1~ 3.2.55);

---Changed the names of some terms (see 3.1.4.4, 3.1.30, 3.1.32, 3.1.33.4, 3.1.39, 3.1.55.2, 3.1.55.5, 3.1.55.11, 3.1.58.1, 3.1.73.2, 3.1.74.1, 3.1.80.2.4, 3.1.85.5, 3.1.87.8, 3.1.90.4, 3.1.90.5, 3.1.93, 3.1.99.11, 3.1.113, 3.1.117.5, 3.1.117.6, 3.1.138, 2011 version 3.14.4, 3.30, 3.32, 3.33.4, 3.39, 3.54.2, 3.54.5, 3.54.11, 3.57.1, 3.72.2, 3.73.1, 3.79.2.4, 3.84.5, 3.86.8, 3.89.4, 3.89.5, 3.92, 3.98.11, 3.112, 3.115.5, 3.115.6, 3.136);

---Changed the definitions of some terms (see 3.1.4, 3.1.4.2, 3.1.4.2, 3.1.4.7, 3.1.5, 3.1.6, 3.1.11, 3.1.13, 3.1.17, 3.1.18, 3.1.9, 3.1.20, 3.1.27.2, 3.1.27.4, 3.1.30, 3.1.31, 3.1.32.3, 3.1.32.4, 3.1.35, 3.1.38.3, 3.1.45, 3.1.50, 3.1.52, 3.1.53, 3.1.54.2, 3.1.58.1, 3.1.60, 3.1.68, 3.1.81.4, 3.1.87.1, 3.1.89.3, 3.1.89.4, 3.1.90, 3.1.90.5, 3.1.90.6, 3.1.90.8, 3.1.95, 3.104, 3.1.106.7.1, 3.1.108.1, 3.1.113, 3.1.126, 3.1.127, 3.1.145.1, 2011 version 3.4, 3.4.2, 3.4.2.1, 3.4.7, 3.5, 3.6, 3.11, 3.13, 3.17, 3.18, 3.19, 3.20, 3.27.2, 3.27.4, 3.30, 3.31, 3.32.3,

3.32.4, 3.35, 3.38.3, 3.44, 3.49, 3.51, 3.52, 3.53.2, 3.57.1, 3.59, 3.67, 3.80.4, 3.86.1, 3.88.3, 3.88.4, 3.89, 3.1.90.5, 3.89.6, 3.89.8, 3.94, 3.103, 3.105.7.1, 3.107.1, 3.112, 3.124, 3.125, 3.141.1);

---Deleted the term "focusing mechanism (microscope)" (see 3.67.1 of the 2011 edition);

---Deleted the term "phase shift" (see 3.109.2 of the 2011 version).

This document is modified to adopt ISO 10934:2020 "Terminology of Microscope Optical Microscopy".

The technical differences between this document and ISO 10934:2020 and their reasons are as follows.

---Added the allowed term "field curvature" in 3.1.4.4 to comply with my country's standard terminology;

---Changed the general barrel coefficient symbols of 3.1.90.2 and 3.1.90.3 to conform to my country's standard terminology habits.

The following editorial changes have been made to this document.

---Deleted the content of maintaining the terminology database in Chapter 3;

---Added "Note" in 3.1.57 term definition content;

---Deleted "Note 1" in the definition of terms in 3.1.86;

---Deleted "Note 1" in 3.1.87 term definition content;

---Deleted "Note 2" in the definition of terms in 3.1.90;

---Deleted the entry number in the definition content of the term;

---Added "Note" in 3.1.106.7.1 term definition content;

---Deleted "Note 1" in the definition of terms in 3.1.124;

---Deleted the source in the 3.2.55 terminology;

---Added formula number;

---References changed.

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Introduction

The optical microscope is a precision optical instrument that is widely used in various fields such as scientific research, teaching, medical and health care, and manufacturing.

Daiguang mechatronics equipment is often equipped with micro-optical systems. Terminology and definitions related to optical microscopy in optical microscopy Whether the meaning expressed is accurate or not is directly related to the uniformity of technical language in the use, design, manufacturing and quality assessment of optical microscopes. and accuracy.

In view of the above reasons, in order to promote the orderly development of the optical microscope industry and improve the technical level of products, it is necessary to the terms and definitions used are scientifically standardized and accurately defined.

microscope optical microscopy terminology

1 Scope

This document defines terms and definitions used in the field of optical microscopy and advanced techniques in optical microscopy.

This document is suitable for the formulation of optical microscope standards, the preparation of technical documents, the preparation of teaching materials and books and periodicals, and the translation of documents, etc.

2 Normative reference documents

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Terms and definitions related to optical microscopy

3.1.1

Abbe test plate Abbe test plate A device for detecting chromatic aberration and spherical aberration of microscope objectives.

Note: When testing spherical aberration, find the cover glass thickness that best corrects the objective lens. The Abbe test plate is composed of different parallel stripes arranged in groups of different widths.

Made of transparent metal layer glass slide. The edges of these fringes are irregularly jagged to allow easier evaluation of aberrations. The initial sum of the breadboard the most common form is a glass slide covered with a wedge-shaped coverslip, the increase in thickness of which is marked on the slide. In addition, there are parallel strips without coverslip Slides with textured and/or reflective stripes are also used.

3.1.2

Explanation of the mechanism of microscopic image formation.

Note: This principle assumes coherent light illumination and is based on a three-stage process involving diffraction.

- a) The first stage. the object diffracts light from the light source;
- b) The second stage. the objective lens collects and focuses part of the diffracted beam, and forms the primary diffraction pattern of the object on the back focal plane of the objective lens according to the laws of geometric optics;
- c) The third stage. the diffracted beam continues to move forward along its optical path and is focused again. The result of their interference is called the primary image of the microscope.

Explains the necessity of objective lenses to collect as many rays as possible diffracted by objects so that they can participate in imaging. If the number of rays diffracted by objects is If light cannot participate in imaging, the details of the object cannot be distinguished.

3.1.3

aberration

< Materials and Geometry> Defects in the ideal image of an optical system caused by the material properties of the lens or the geometry of the refractive or reflective surfaces.

Deviation.

3.1.4

aberration

< Optical System> Defects in the optical system that prevent the production of an ideal image.