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

GB/T 43846.1-2024

**Microscopes - Designation of microscope objectives - Part 1:
Flatness of field/Plan**

显微镜 显微镜物镜的命名 第1部分：像场平面度/平场

(English Translation)

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Table of Contents

Preface
Introduction
1 Scope
2 Normative references
3 Terms and Definitions
4 Requirement
4.1 Sign
4.2 Determination of flat field objective
4.3 Determination of the number of draws
Appendix A (Informative) Calculation of Depth of Field in Object Space Using the Bellec Formula
A:1 Berek's formula
A:2 Depth of field of the objective lens calculated using the Bellec formula
References

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 1 of GB/T 43846 "Nomenclature of microscope objectives": GB/T 43846 has been published for the following part:

- Part 1: Image field flatness/flat field;
- Part 2: Chromatic aberration correction;
- Part 3: Spectral transmittance:

This document is modified to adopt ISO 19012-1:2013 "Microscopes - Nomenclature of microscope objectives - Part 1: Image field flatness/flat field":

The technical differences between this document and ISO 19012-1:2013 and their reasons are as follows:

- Deleted "The mark of the objective field number is not applicable to the objective sold before:2014:" (see 4.1) to comply with the Chinese standard Use habit:

The following editorial changes were made to this document:

- Deleted "ISO 10934-1" in the note (see Chapter 1);
- Change "(unit is millimeters)" to "Note" (see 3.6);
- Change "expressed as: $PFR = PFN/OFN$ " to "Note" (see 3.8);
- Add "(wavelength is 546:07nm)" in formula (2) (see 4.3);
- Added explanation of the item number and symbols in formula (A:1) (see Appendix A):

Introduction

With the rapid development of various scientific and technological fields at home and abroad, microscopes are widely used in scientific research, teaching, medical care and industrial manufacturing:

In the optical system, the microscope objective is an important part of various types of optical microscopes: It is the first light to form an image of an object:

It is an important component to ensure the clear imaging of the microscope: Therefore, when designing and naming the microscope objective, it is necessary to consider the microscope the parameters and functions of the objective lens enable the optical microscope to function normally in various applications, thus ensuring the quality of the optical microscope product:

Design, quality and application, promote coordination among enterprises and improve production efficiency:

In view of the above reasons, it is very important to standardize and normalize the naming of microscope objectives according to the relevant parameters and functions of different types of objectives:

Very necessary:

GB/T 43846 "Nomenclature of microscope objectives" contains the terms, signs, logos and requirements of objectives, and is based on Objective lenses are named according to their parameters and functions: GB/T 43846 is divided into three parts:

--- Part 1: Image field flatness/flat field: The purpose is to specify the use of the "flat field" mark on the microscope objective and define the flat field:

The diameter of the clear image area on the object's surface:

--- Part 2: Chromatic aberration correction: The purpose is to specify the categories of chromatic aberration correction and the minimum requirements for chromatic aberration correction:

--- Part 3: Spectral transmittance: The purpose is to specify the way in which optical

designers and microscope users describe the spectral transmittance of objectives:

Nomenclature of microscope objectives Part 1: Image field flatness/field flatness

1 Scope

This document specifies the use of the notation "Flat Field" on microscope objectives, which defines the diameter of the region of sharp focus of the principal image on a flat object surface:

This document applies to visual observations using the objective, tube lens, and eyepiece combinations specified by the manufacturer:

The objective lens designations in this document are consistent with ISO 8578:

NOTE: Flatness of field does not imply any degree of correction for other aberrations:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document:

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document:

Note: GB/T 27668-2023 Microscopes - Optical microscopy - Terminology (ISO 10934:2020, MOD):

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in ISO 10934 and the following apply:

An object containing several short lines perpendicular to the object field radius:

All meridian structure objects are focused and imaged clearly in the main image space, ignoring other curvatures except astigmatism and Petzvan curvature:

Aberration:

An object containing several short lines parallel to the object field radius:

Sagittal image surface all sagittal objects are focused and imaged clearly in the principal image space, ignoring other aberrations except astigmatism and Petzvan curvature:

astigmatic difference the size difference between the sagittal image plane and the image plane along the optical axis in the meridional plane:

Planfield number; PFN A numerical value used to specify the diameter of the main image

clear area on the surface of a planar object: