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**Image measurement method for numerical aperture of
microscopic objective**

显微物镜数值孔径图像式测量方法

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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 is required.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

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Image-based measurement method for numerical aperture of microscope objective

1 Scope

This document describes the measurement principle, measurement device, measurement environment, measurement steps and Uncertainty analysis.

This document applies to the numerical aperture measurement of infinity-corrected microscope objectives with a nominal numerical aperture greater than 1.00.

2 Normative references

GB/T 26600

JJF 1059.1-2012

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 diameter of total reflection circle

The circular shape formed on the image sensor by light reflected from the lower surface of the cover glass and the air interface with an incident angle less than the critical angle of total reflection The diameter of the pattern.

3.2 diameter of numerical aperture circle

The circular shape formed on the image sensor by light reflected from the lower surface of

the cover glass and the air interface with an incident angle greater than the critical angle of total reflection The diameter of the pattern.

3.3 Objective

The first component of an imaging system that forms the initial image of an object.

Note. It is composed of lenses, lens assemblies and related parts, and can be used alone or in combination with tube lenses.

[Source. GB/T 27668-2023, 3.1.106, modified]

3.4 Infinity-corrected objective

The initial image distance of the object is corrected at infinity, so an objective lens corresponding to the tube lens is required.

[Source. GB/T 27668-2023, 3.1.106.3, modified]

3.5 numerical aperture; NA

It is expressed as $n \sin u$, where n is the refractive index of the medium between the objective and the object, and u is half the aperture angle of the objective.

[Source. GB/T 27668-2023, 3.1.10.4, modified]