INTERNATIONAL STANDARD

ISO 19056-3

First edition
2022-01

Microscopes — Definition and measurement of illumination properties —

Part 3: Incident light fluorescence microscopy with incoherent light sources

Microscopes — Définition et mesurage des propriétés d'éclairage —

Partie 3: Microscopie par fluorescence à lumière incidente avec sources lumineuses incohérentes

Reference number
ISO 19056-3:2022(E)

© ISO 2022



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

© ISO 2022 – All rights reserved

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Measurands **1**
4.1 General 1
4.2 Illumination brightness 1
4.3 Temporal stability 2
4.3.1 General 2
4.3.2 Short-term stability of radiant flux 2
4.3.3 Long term stability of radiant flux 2
4.4 Uniformity 3
5 Measurement procedure **3**
5.1 General 3
5.2 Microscope settings 3
5.3 Illumination brightness 4
5.4 Temporal stability 4
5.5 Uniformity 5
5.6 Spectral information 6
6 Information provided to the user **6**
Annex A (informative) **Examples** **7**

© ISO 2022 – All rights reserved

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 172 *Optics and photonics*, Subcommittee SC 5, *Microscopes and endoscopes.*

A list of all parts in the ISO 19056 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

© ISO 2022 – All rights reserved

Introduction

This document defines important quantities and methods to assess the quality of incident light fluorescence illumination for microscopes as well as methods to measure them. Details covered will enable users to compare different microscopes quantitatively with respect to their fluorescence illumination prior to a purchase decision and chose an appropriate instrument according to their application. Data obtained by following these methods also enables users to compare existing instruments with each other or to track performance variations over time, assuring proper performance. Additionally, what information is to be provided to the user is covered.

© ISO 2022 – All rights reserved

Microscopes — Definition and measurement of illumination properties —

Part 3: Incident light fluorescence microscopy with incoherent light sources

1 Scope

This document specifies procedures for the measurement of illumination brightness, temporal stability and uniformity for incident light fluorescence microscopy. The measurement for uniformity is defined in image planes or intermediate image planes only, when these planes are suitable for detection by electronic imaging devices.

This document defines how illumination brightness, temporal stability and uniformity are measured, and how this information is provided to the user.

NOTE The scope is intentionally limited to electronic imaging devices and (intermediate) image planes. The visual observation by means of eyepieces would require a different measurement procedure and hence result in ambiguities in the description of measurement procedures. Nevertheless, this document will give useful estimates for the uniformity with visual observation as in this case an eyepiece is used to observe an intermediate image plane (which is under the scope of this document).

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Measurands

4.1 General

For obtaining the desired image quality, when using a light microscope, the brightness, temporal stability and uniformity of the image play an important role. This holds true for different applications and various types of instruments. The measurement of illumination brightness and uniformity is mandatory. The temporal stability is an optional measurement because it is only suitable for certain types of light sources (e.g. arc lamps).

4.2 Illumination brightness

The illumination shall be bright enough to allow the detection of the details of the object under investigation.

© ISO 2022 – All rights reserved