

---

---

**Microscopes — Vocabulary for light  
microscopy**

*Microscopes — Vocabulaire relatif à la microscopie optique*



This document is a preview generated by EKO



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2020

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](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
3.1 Terms and definitions relating to light microscopy.....	1
3.2 Terms and definitions relating to advanced techniques in light microscopy.....	44
<b>Bibliography</b> .....	<b>54</b>
<b>Index</b> .....	<b>55</b>

## 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](http://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](http://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](http://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*.

This first edition cancels and replaces ISO 10934-1:2002 and ISO 10934-2:2007, which have been combined and technically revised.

The main changes compared to the previous edition are as follows:

- update of the title;
- added new terms for light microscopy: focal length of normal tube lens, objective field number, pixel, pixel size, Airy unit, excitation wavelength, excitation wavelength band, detection wavelength band, OSTD added as new terms;
- added new terms for advanced techniques in light microscopy: coherent anti-stokes Raman scattering microscopy, stimulated Raman scattering microscopy, structured illumination microscopy, super-resolution microscopy, localization microscopy, stimulated emission depletion microscopy, super-resolution structured illumination microscopy, light sheet microscopy, digital holographic microscopy, optical coherence microscopy;
- terms amended: diffraction limit of resolving power, resolution;
- editorially revised.

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](http://www.iso.org/members.html).

# Microscopes — Vocabulary for light microscopy

## 1 Scope

This document specifies terms and definitions to be used in the field of light microscopy and advanced techniques in light microscopy.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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 <http://www.electropedia.org/>

### 3.1 Terms and definitions relating to light microscopy

#### 3.1.1

##### **Abbe test plate**

device for testing the *chromatic* (3.1.4.2) and *spherical aberration* (3.1.4.7) of *microscope* (3.1.99) *objectives* (3.1.106)

Note 1 to entry: When testing for spherical aberration, the cover glass thickness for which the objective is best corrected is also found. The test plate consists of a slide on which is deposited an opaque metal layer in the form of parallel strips arranged in groups of different width. The edges of these strips are irregularly serrated to allow the aberrations to be judged more easily. In its original and most common form, the slide is covered with a wedge-shaped cover glass, the increasing thickness of which is marked on the slide. Additional versions without the cover glass and/or with reflective stripes are also in use.

#### 3.1.2

##### **Abbe theory of image formation**

explanation of the mechanism by which the *microscope* (3.1.99) *image* (3.1.75) is formed

Note 1 to entry: It assumes coherent illumination and is based on a three-step process involving diffraction.

- a) First step: the object diffracts light coming from the source.
- b) Second step: the objective collects some of the diffracted beams and focuses them, according to the laws of geometrical optics, in the back focal plane of the objective to form the primary diffraction pattern of the object.
- c) Third step: the diffracted beams continue on their way and are reunited; the result of their interference is called the primary image of the microscope.

This explains the necessity for the maximum number of rays diffracted by the object to be collected by the objective, so that they may contribute to the image. Fine detail will not be resolved if the rays it diffracts are not allowed to contribute to the image.