

# A NEW ISO NORM ABOUT PERFORMANCE ASSESSMENT OF FLUORESCENCE CONFOCAL LASER-SCANNING MICROSCOPES

**Arnaud Royon, Gautier Papon**  
**ARGOLIGHT**

**11 Avenue de Canteranne, F-33600 Pessac, France**  
**E-mail: a.royon@argolight.com**

**KEY WORDS:** ISO, norm, performance assessment, quality control, confocal laser-scanning fluorescence microscopy.

It is nowadays recognized by the microscopists community and the microscopes manufacturers that controlling the quality and assessing the performance of fluorescence microscopes is an important issue that needs to be addressed. On the academic side, this topic has been in the program of the Core Facility Satellite Meeting of the ELMF meetings every two years since 2015. On the industry side, at the initiative of the main microscopes manufacturers, a new ISO norm was recently published, entitled “Optical data of fluorescence confocal microscopes for biological imaging” [1].

<b>Contents</b>		<b>Page</b>
Foreword	.....	iv
Introduction	.....	v
<b>1</b>	<b>Scope</b> .....	<b>1</b>
<b>2</b>	<b>Normative references</b> .....	<b>1</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>1</b>
<b>4</b>	<b>Quantities</b> .....	<b>2</b>
4.1	Resolution and strength of optical sectioning .....	2
4.1.1	General .....	2
4.1.2	Definition of resolution .....	3
4.1.3	Definition of strength of optical sectioning .....	3
4.1.4	Measurement .....	3
4.2	Uniformity of field and centring accuracy .....	6
4.2.1	Definition of uniformity of field and centring accuracy .....	6
4.2.2	Measurement .....	6
4.3	Co-registration accuracy .....	7
4.3.1	Definition of co-registration accuracy .....	7
4.3.2	Measurement of co-registration accuracy .....	8
4.4	Stability of illumination power .....	8
4.4.1	General .....	8
4.4.2	Measurement of stability of illumination power .....	9
4.5	Field number of the confocal scan optic .....	10
4.5.1	General .....	10
4.5.2	Definition of field number of the confocal scan optic .....	10
4.5.3	Measurement of maximum diameter of scanned field .....	10
4.6	Scanning frequency .....	10
<b>Annex A (informative) Theoretical resolution</b> .....		<b>13</b>
<b>Bibliography</b> .....		<b>15</b>

Figure 1: Outline of the recently published ISO norm about measuring the performance of confocal microscopes.

The norm contains definitions and measurement guidelines for six parameters: resolution and strength of optical sectioning, field uniformity, co-registration accuracy, illumination power, XY distances and scanning frequency (*cf.* Fig. 1). In this presentation, we will present the content of the norm, describe the measurement guidelines and suggest, in an exhaustive way, the different tools that can be used for such purposes.

[1] ISO 21073-2019, “Optical data of fluorescence confocal microscopes for biological imaging” (2019).