

Editorial

Michael Pfeffer*

Introduction to the special issue on ‘Standards in Optics and Optical Measurement’

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From a purely scientific point of view standards do not appear interesting for a scientific journal. However, as standards are legally considered as ‘generally recognized codes of practice’, scientific evidence has to be provided. Moreover, the method to verify a certain standardized parameter or process has to be taken into account too. This is why we dedicated this issue of *Advanced Optical Technologies* to ‘Standards in Optics and Optical Measurement’.

Especially when it comes to international standards, the aspect of ‘generally recognized codes of practice’ has to face an internationally accepted definition or procedure, beyond all national traditions and customs. This became clearly visible to our editorial board when dealing with Schröder et al.’s contribution on ‘Standardization of light scattering measurements’.

Sometimes readers of optical ISO standards may wonder about ‘somehow strange indications’. Often these are the result of long discussions and acceptance processes by the national committees; especially, because mostly the national language of the majority of ISO members is not English. Often there is no direct linguistic correspondence for certain technical expressions, thus traditional national expressions and definitions have to be brought into question and premised on a clear scientific base.

As we are all interested in protecting our health, especially our eyes, against harmful optical radiation, the article of Gappenach et al. addresses all those being interested in the scientific base when selecting laser eye protectors. The challenge for the members of the corresponding technical committee TC 94 was not only to manage the physical technical issues but also to respect biomedical and health-protection criteria. Again, scientific evidence has to be proven.

Materials with new properties will certainly play a major role in future optical systems, devices and elements.

*Corresponding author: Michael Pfeffer, Hochschule Ravensburg-Weingarten – Optical Systems Engineering, Doggenriedstrasse, 88250 Weingarten, Germany, e-mail: pfeffer@hs-weingarten.de

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Along with the increased importance of materials, the challenge of how to verify and characterize certain material parameters emerges. Standards could play a prominent role here. That is why we decided to invite Peter Hartmann to do a review article on optical glass standards.

Most people will hardly distinguish between the characteristics of standards, e.g. published as MIL-standards and those published as ISO-standards. However, with respect to the origination process these two standard types differ greatly. Whereas the first are merely driven by governmental, political or societal aspects, the latter are driven by economical and industrial parameters. Subsequently, the origination process is typically a top-down-process in the case of MIL-standards, whereas ISO-standards are created by multinational teams in a democratic bottom-up process. However, this requires much more balancing and therefore a clear scientific base.

Within ISO the field of optics and photonics is mainly covered by the Technical Committee TC 172, dealing with standardization of terminology, requirements, interfaces and test methods in the field of optics and photonics. This includes complete systems, devices, instruments, ophthalmic optics, optical and photonic components, auxiliary devices and accessories, as well as materials. Optics and photonics are used in the meaning of generation, handling and detection of optical radiation including signal processing. For specific items there are further technical committees such as in the field of cinematography (ISO/TC 36), photography (ISO/TC 42), eye protectors (ISO/TC 94), micrographics (ISO/TC 171), fiber optics for telecommunication (IEC/TC 86) and electrical safety of optical elements, and general lighting.

Standards are a crucial requirement in the global development processes of complex products such as optical systems. In this issue we intend to cover some of the new and challenging aspects in the development of such standards. I hope that you find it as exciting to read as we did to prepare.

Michael Pfeffer
Editor-in-Chief

**Michael Pfeffer**

Hochschule Ravensburg-Weingarten –
Optical Systems Engineering
Doggenriedstrasse, 88250 Weingarten
Germany
pfeffer@hs-weingarten.de

Michael Pfeffer graduated in 1998 from the Institute of Applied Optics at EPFL (Switzerland), obtaining his PhD for a thesis in the field of Optical Nanotechnology. In 2002, after several years of working in the Swiss optics industry, he was appointed Full Professor of Optics and Engineering in the Department of Physical Engineering of Hochschule Ravensburg-Weingarten, University of Applied Sciences (Germany). Dr. Pfeffer teaches and researches in the field of optics, physical instrument design, and nanotechnology. Currently, he serves as Vice-Rector for Research and International Relations. In 2005, the General Membership Meeting elected him to the Executive Board and CEO for the DGaO Annual Meeting 2006. From 2008 to 2012 he served as President of the German Society of Applied Optics (DGaO). In 2012 he was elected as Secretary of the Board of the European Optical Society (EOS). Dr. Pfeffer is member of the German Physical Society (DPG), the German Society of Engineers (VDI), and the Standards Committee, ‘Precision Engineering and Optics’ of the German Institute of Standardization (DIN).