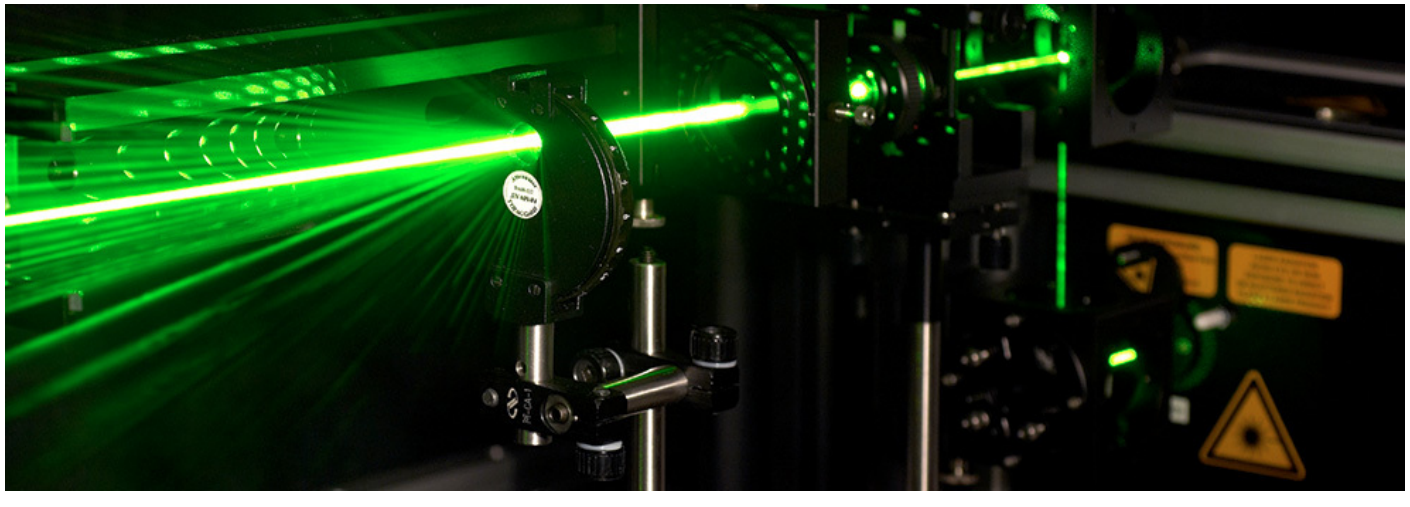
SEIBERSDORF LABORATORIES



Laser, LED & Lamp Safety / Newsletter 2025/02

We would like to inform you that our newsletter will soon be sent from a new email address: laser-led-lamp-safety@s-l.at
To ensure you continue receiving our newsletter, please whitelist our new email address in your spam filter settings.
No action is needed regarding your subscription. Thank you for your continued interest in our updates!

We wish you Happy Holidays and all the best for the new year!
The Laser-LED-Lamp-Safety Team at Seibersdorf Laboratories

Paper on safety classification of line lasers (IEC 60825-1)

Our peer reviewed paper on the safety classification of line lasers according to IEC 60825-1 has been published. The author manuscript version is available in our download section. Line lasers are good examples for classification of laser products as **extended source**, where the variation of accommodation of the eye is important to consider. For small beam profiles at the line-shaping optics (the beam waist in the diverging axis), accommodation to the line-shaping optics is the worst case, otherwise accommodation to infinity. Our test house team has specialised in the testing of extended sources.

>> link to download section

ISO 15004-2:2024 (Ophthalmic Instruments)

In October, our accredited test house had a successful re-audit, confirming the accreditation for testing according to the 2024 edition of ISO 15004-2 (Ophthalmic instruments - Light hazard protection). This second edition features relevant changes in the Group 1 exposure limits and Group 2 Recommended Maximum Exposure (RME), particularly for the retinal thermal hazard limits.

There is an amended spectral weighting function R(λ), now anchored to 700 nm. Based on input from our analysis (see paper), for exposure durations greater than 10 s, the visible regime was exempted from the “overweighting” by R(λ) > 1 (footnote a in the limit tables).

The Group 1 retinal thermal limits now also feature a dependence on the retinal image diameter, following the recommendation by ICNIRP, incorporating the t-dependent alpha-max (or d-max) into the limit equations. However, compared to the ICNIRP guidelines, the retinal thermal limit is somewhat higher, and does not feature a multi-pulse reduction factor. According to our analysis, for the Group 2 RME, it cannot be ruled out that in some cases, **retinal injury may occur at or somewhat below the RME.** This was the main reason why the Austrian National Committee voted “no” on the draft. The response was that the standard requires a risk assessment if the Group 1 limits are exceeded. The value of the Group 2 RME as a safety criterion is therefore somewhat limited. With our computer model for retinal thermal injury (which was also the tool to propose the ICNIRP d-dependence) we can support such a formal **risk assessment.**

>> Paper on wavelength dependence

>> Paper on updating the retinal image diameter dependence

Seibersdorf Labor GmbH
Laser, LED und Lampen-Sicherheit
Prüfstelle und Beratung

2444 Seibersdorf
Austria

T: +43 50550-2533
W: https://laser-led-lamp-safety.seibersdorf-laboratories.at
E: laser-led-lamp-safety@s-l.at