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TECHNICAL REPORT

colour inside

Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires

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CONTENTS

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IEC TR 62778, which is a technical report, has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

This second edition cancels and replaces the first edition published in 2012. This edition constitutes a technical revision.

This edition includes the following significant technical change with respect to the previous edition: inclusion of the photobiological assessment of LED arrays (Annex D).

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
34A/1737/DTR	34A/1758/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

APPLICATION OF IEC 62471 FOR THE ASSESSMENT OF BLUE LIGHT HAZARD TO LIGHT SOURCES AND LUMINAIRES

1 Scope

This Technical Report brings clarification and guidance concerning the assessment of blue light hazard of all lighting products which have the main emission in the visible spectrum (380 nm to 780 nm). By optical and spectral calculations, it is shown what the photobiological safety measurements as described in IEC 62471 tell us about the product and, if this product is intended to be a component in a higher level lighting product, how this information can be transferred from the component product (e.g. the LED package, the LED module, or the lamp) to the higher level lighting product (e.g. the luminaire).

A summary of recommendations to assist the consistent application of IEC 62471 to light sources and luminaires for the assessment of blue light hazard is given in Annex C.

NOTE It is expected that HID and LED product safety standards will make reference to this Technical Report.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts), *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org>).

IEC 62471:2006, *Photobiological safety of lamps and lamp systems*

CIE S 017/E:2011, *ILV: International Lighting Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62471:2006, CIE S 017/E:2011 and IEC 60050-845 as well as the following apply.

3.1
blue light hazard efficacy of luminous radiation
***K*$_{B,v}$**
quotient of blue light hazard quantity to the corresponding photometric quantity

Note 1 to entry: Blue light hazard efficacy of luminous radiation is expressed in W/lm.

Note 2 to entry: The quantity $\Phi_\lambda(\lambda)$ in the formula below can be replaced by $L_\lambda(\lambda)$ or $E_\lambda(\lambda)$.

$$K_{B,v} = \frac{\int \Phi_\lambda(\lambda) \cdot B(\lambda) \cdot d\lambda}{K_m \cdot \int \Phi_\lambda(\lambda) \cdot V(\lambda) \cdot d\lambda}$$

where K_m = 683 lm/W.

Note 3 to entry: $K_{B,v} = L_B/L = E_B/E$.