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Incorporating corrigendum July 2014



BSI Standards Publication

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

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National foreword

This Published Document is the UK implementation of IEC/TR 62778:2014, incorporating corrigendum July 2014. It supersedes PD IEC/TR 62778:2012, which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee CPL/34, Lamps and Related Equipment, to Subcommittee CPL/34/1, Electric lamps.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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TECHNICAL REPORT



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

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CONTENTS

FOREWORD.....4

1 Scope.....6

2 Normative references6

3 Terms and definitions6

4 General 11

5 Spectrum, colour temperature, and blue light hazard 12

 5.1 Calculation of blue light hazard quantities and photometric quantities from emission spectra..... 12

 5.2 Luminance and illuminance regimes that give rise to t_{max} values below 100 s 15

6 LED packages, LED modules, lamps and luminaires..... 17

7 Measurement information flow 18

 7.1 Basic flow 18

 7.2 Conditions for the radiance measurement 20

 7.3 Special cases (I): Replacement by a lamp or LED module of another type 22

 7.4 Special cases (II): Arrays and clusters of primary light sources 22

8 Risk group classification 22

Annex A (informative) Geometrical relations between radiance, irradiance and radiant intensity 23

Annex B (informative) Distance dependence of t_{max} for a certain light source 25

Annex C (informative) Summary of recommendations to assist the consistent application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires 27

 C.1 General..... 27

 C.2 Situation of RG0 or RG1 classification not requiring radiance or irradiance measurement..... 27

 C.2.1 Boundary conditions 27

 C.2.2 True luminance values giving risk group not greater than RG1 27

 C.2.3 Illuminance values giving risk group not greater than RG1 28

 C.3 Situation for the classification of light sources larger than 2,2 mm and luminaires using these light sources..... 29

 C.4 Situation for the classification of light sources smaller than 2,2 mm and luminaires using these light sources..... 30

 C.5 Situation for the classification of light sources that pose practical difficulties in measurements at 200 mm 30

Annex D (informative) Detailed assessment of arrays and clusters of primary light sources, comprised of LED packages 31

 D.1 General..... 31

 D.2 Approach 31

 D.2.1 Step by step assessment 31

 D.2.2 Type of arrays and additional steps 32

 D.2.3 Complete flowchart 34

 D.3 Derivation of the formula for average radiance of the full array 35

Bibliography..... 37

Figure 1 – Blue light hazard efficacy of luminous radiation, $K_{B,v}$, for a range of light sources from different technologies, and for a few typical daylight spectra 13

Figure 2 – Comparison between the curves involved in calculating $K_{B,y}$ (the photopic eye sensitivity curve and the blue light spectral weighting function) and the CIE 1931 Y and Z curves involved in calculating the CIE 1931 x, y colour coordinates	14
Figure 3 – Correlation plot between the quantity $(1 - x - y)/y$, calculated from the CIE 1931 x, y colour coordinates, and the value of $K_{B,y}$, for all the spectra analysed to generate Figure 1	15
Figure 4 – Estimate of the luminance level where $L_B = 10\,000\text{ W}/(\text{m}^2\text{sr})$, border between RG1 ($t_{\text{max}} > 100\text{ s}$) and RG2 ($t_{\text{max}} < 100\text{ s}$) in the large source regime, as a function of CCT.....	16
Figure 5 – Estimate of the illuminance level where $E_B = 1\text{ W}/\text{m}^2$, border between RG1 ($t_{\text{max}} > 100\text{ s}$) and RG2 ($t_{\text{max}} < 100\text{ s}$) in the small source regime, as a function of CCT16	
Figure 6 – Relation of illuminance E , distance d and intensity I	20
Figure 7 – Flow chart from the primary light source (in blue) to the luminaire based on this light source (in amber)	21
Figure A.1 – Schematic image of the situation considered in Annex A.....	23
Figure B.1 – General appearance of t_{max} as a function of viewing distance d , for any light source with homogeneous luminance L and diameter D	26
Figure C.1 – Luminance values from Table C.1 in relation to the RG1/RG2 border as function of correlated colour temperature	28
Figure C.2 – Illuminance values from Table C.2 in relation to the RG1/RG2 border as function of correlated colour temperature	29
Figure D.1 – Examples of secondary lenses with identical light distribution and alignment.....	32
Figure D.2 – Examples of LED arrays with bare LED packages.....	33
Figure D.3 – Evaluation whether one or more LED elements fall in 11 mrad field of view at distance d_1	33
Figure D.4 – Complete flowchart of the detailed assessment of arrays and clusters of primary light sources.....	35
Table 1 – Correlation between exposure time and risk group	10
Table C.1 – Luminance values giving risk group not greater than RG1.....	28
Table C.2 – Illuminance values giving risk group not greater than RG1	29
Table D.1 – Applicability of steps 1 to 6	31

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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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 $K_m = 683 \text{ lm/W}$.

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