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Test Report

Guangdong Supersmart Semicondutor Co.,Ltd **Client Name** : PL

No.9 Zhongnan South Road, Shansha Community, Address Dongguan City, Guangdong Province

Product Name Ceramic Packaged UV LED

Date 2021-06-29

> Compliance Labo Shenzhen Anbotek Pengcheng Compliance Laboratory Limited

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Address: Zone B, 1/F., Building 2, Phase III, Huangtian Yangbei Industrial Zone, Huangtian Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China. Tel:(86) 755-26066440 Fax: (86) 755-26014772 Email: service@anbotek.com

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TEST REPORT

EN 62471:2008

Photobiological Safety of Lamps and Lamp Systems

Report Reference No	: 68260LC10028901
Tested by (printed name + signature)	: Xander Yuan Xander Yuan
Supervised by (printed name + signature)	: Flora Zhang Flora Zhang
Testing Laboratory	Zone B, 1/F., Building 2, Phase III, Huangtian Yangbei Industria : Zone, Huangtian Community, Hangcheng Street, Bao'an District Shenzhen, Guangdong, China.
Testing location Applicant's Name Address	: Guangdong Supersmart Semicondutor Co.,Ltd No.9 Zhongnan South Road, Shansha Community, Dongguan City Guangdong Province
Test Specification: Standard Test procedure Non-standard test method	: Type Test
Test Item Description	V 10' P'' 10'
Manufacturer	: Guangdong Supersmart Semicondutor Co.,Ltd
Address	No.9 Zhongnan South Road, Shansha Community, Dongguan City Guangdong Province
Model/Type reference	: UVLED 365-420nm
Ratings	Not he see the

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or use in part without prior written consent from Shenzhen Anbotek Pengcheng Compliance Laboratory Limited. The test results presented in this report relate only to the object tested.

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Summary of Testing:				
Tests performed (name of test and test clause):	Testing location:			
This appliance complies with EN 62471:2008 standards requirements.	Shenzhen Anbotek Pengcheng Compliance Laboratory Limited			
The EUTs passed relevant tests.	Zone B, 1/F., Building 2, Phase III, Huangtian Yangbei Industrial Zone, Huangtian Community,			
Anbotek Anbotek Anbotek Anbotek	Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.			
Anbor Anbotek Anbotek Anbotek Anbo	Anbotek Anbote And And Anbotek Anbotek			

Summary of Compliance with National Differences:

N/A

N/A

Copy of Marking Plate:

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Test Item Particulars:	
Tested lamp	: 🖂 Continuous wave lamps 🛛 🗌 Pulsed lamps
Tested lamp system	: N/A
Lamp classification group	: 🛛 RG0 Exempt
Anbotek Anbotek Anbotek Anbotek Anb	
Lamp cap	□ RG3 High Risk : N/A
Lamp cap	: N/A
Lamp cap Test item description Test model	: Ceramic Packaged UV LED
Lamp cap Test item description Test model Rated of the lamp	: UVLED 365-420nm
Rated of the lamp	: DC3.4V
Possible Test Case Verdicts:	
Test case does not apply to the test object	: N/A (Not Applicable)
Test object does meet the requirement	: P (Pass)
Test object does not meet the requirement	: F (Fail)
Testing:	
Ambient temperature of tested	: 25.1°C
Test inputs	: DC3.4V
Sample size for tested	: 1pcs
Date of receipt of test item	: 2021-06-28
Test inputs Sample size for tested Date of receipt of test item Date (s) of performance of tests	: 2021-06-28
General Remarks:	
The test results presented in this report relate only	y to the object tested.
This report shall not be reproduced, except in full, laboratory.	without the written approval of the Issuing testing
"(See Enclosure #)" refers to additional informatio	n appended to the report
"(See appended table)" refers to a table appended	No.
Throughout this report a point is used as the decir	20 ¹ 20 ¹

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N.	NOT AM NO.	Pr	p- 1
	EN 62471:2008		
Clause	Requirement + Test	Result – Remark	Verdict
4 det	EXPOSURE LIMITS	his lek boren	Ann P
Anbo	Contents of the whole Clause 4 of IEC 62471:2006 moved into a new informative Annex ZB	en Anbor All	Anboren
Pres.	Clause 4 replaced by the following:	poto Am	* P Anbo
otek Ar	Limits of the Artificial Optical Radiation Directive (2006/25/EC) have been applied instead of those fixed in IEC 62471:2006	Anbotek Anbotek An	otek P Al
4.1.	General	print boten	AND P
Anbotek	The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure	ek Anbotek Anbotek	AnbPen
Anbort Anbot	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds 10 ⁴ cd.m ⁻²	potek Anbotek Anbotek Anbote	N/A
4.3	Hazard exposure limits	Ant botek Ant	P
4.3.1	Actinic UV hazard exposure limit for the skin and eye	Anbore Ann Annotek	inboteP
nebotek	The exposure limit for effective radiant exposure is 30 J.m ⁻² within any 8-hour period	Anbovek Anbovek	AnbPot
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance, ES, of the light source shall not exceed	otek Anbotek Anbotek Anbotek	Pour Anbol
Xex You	the levels defined by:	And hotek Anb	0. b.
nbotek	$E_{\rm s} \cdot t = \sum_{200}^{400} \sum_{t} E_{\lambda}(\lambda, t) \cdot S_{\rm UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 30 \qquad \qquad \text{J} \cdot \text{m}^{-2}$	Anborek Anborek	nbote ^k P
Anboten	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:	k Anbotek Anbor	An P Anbotek
	$t_{\rm max} = \frac{30}{E_{\rm S}}$ s Antone Anton	nbotek Anbotek Anbote	Panbo tek an
4.3.2	Near-UV hazard exposure limit for eye	Antek Anbort Ant	P
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed 10000 J.m ⁻² for exposure times less than	Anbotek Anbotek A	Anbotek
	1000 s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, EUVA, shall not exceed 10	tek Anbotek Anbotek	Anbotek
abote	W.m ⁻² .	at botek Anbor	be.
iek Ant	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:	Anbotek Anbotek Anbo	ie ^k P An ⁱ
hore h	$t_{\text{max}} \le \frac{10000}{E_{\text{UVA}}}$ s and a problem in the set of the set o	Anbotek Anbotek	AnboiPA
4.3.3	Retinal blue light hazard exposure limit	hek anbotek Anbotek	P'P

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	EN 62471:2008		
Clause	Requirement + Test	Result – Remark	Verdict
hbotek	To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the	Anbotek Anbotek	Anborek Anborek
Anbotek	blue-light hazard function, $B(\lambda)$, i.e., the blue-light weighted radiance, LB, shall not exceed the levels defined by:	potek Anbotek Anbotek	Anboro Anbr
rek A	$L_{B} \cdot t = \sum_{\substack{300 \\ t}}^{700} \sum_{t} L_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 10^6 \qquad J \cdot m^{-2} \cdot sr^{-1}$	Anbotek Anbotek Ant	otek P p
	$L_{\rm B} = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta \lambda \le 100 \qquad \qquad {\rm W} \cdot {\rm m}^{-2} \cdot {\rm sr}^{-1}$	Anbotek Anbotek	Anbo" P
1.3.4	Retinal blue light hazard exposure limit - small source	the botek Anbor	N/A
Anbotek	Thus the spectral irradiance at the eye $E\lambda$, weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by:100s	potek Anbotek Anbotek	N/A
iek Anbo	$E_{\rm B} \cdot t = \sum_{300}^{700} \sum_{t} E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 100 \qquad {\rm J} \cdot {\rm m}^{-2}$	Anbotek Anbotek Anb	N/A
botek	$E_{\rm B} = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta \lambda \le 1 \qquad \qquad {\rm W} \cdot {\rm m}^{-2}$	Anbotek Anbotek	N/A
1.3.5	Retinal thermal hazard exposure limit	And Land	Roore
Anbo Anbo e ^k Ar	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L λ , weighted by the burn hazard weighting function R(λ) (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:	otek Anbore, Anu Anborek Anborek Anborek Anborek Anborek Anb	k P _{Anbo} Jtek Ar nbotek
Anbotek	$L_{\rm R} = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta \lambda \le \frac{50000}{\alpha \cdot t^{0,25}} \qquad {\rm W} \cdot {\rm m}^{-2} \cdot {\rm sr}^{-1}$	Anbotek Anbotek	Anbreh
1.3.6	Retinal thermal hazard exposure limit – weak visual s	timulus	Р
	For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, LIR, as viewed by	nbotek Anbotek Anbotek Anbotek	PAnbo tek An
potek	the eye for exposure times greater than 10 s shall be limited to:	Annotek Anbotek A	nbornek
Anboten	$L_{\rm IR} = \sum_{780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta \lambda \le \frac{6000}{\alpha} \qquad \qquad W \cdot {\rm m}^{-2} \cdot {\rm sr}^{-1}$	Anbotek Anbotek	Ant P Anbotek
1.3.7	Infrared radiation hazard exposure limits for the eye	ote Ante otek	Panbor
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared	nbotek Anbote, Anbo	rek P An
	radiation, EIR, over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:	Anbotek Anbotek A	Anbotek
Anbor Anbotek	$E_{\rm IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta \lambda \le 18000 \cdot t^{-0,75} \qquad \rm W \cdot m^{-2}$	tek Anbotek Anbotek	Anbotek
10de	For times greater than 1000 s the limit becomes:	k hotek Anbor	Р

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Clause	Requirement + Test	Result – Remark	Verdict
nbotek	$E_{\rm IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta \lambda \le 100 \qquad W \cdot m^{-2} \qquad \text{Minormalian}$	Anbotek Anbotek	Anbotek
4.3.8	Thermal hazard exposure limit for the skin	Anber k sotek	R/pol
Anbots	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:	potek Anbotek Anbotek Anbotek	k P Anb
10 ¹⁴ A	$E_{H} \cdot t = \sum_{380}^{3000} \sum_{t} E_{\lambda}(\lambda, t) \cdot \Delta t \cdot \Delta \lambda \le 20000 \cdot t^{0,25} \qquad J \cdot m^{-2}$	Anbotek Anbotek An	Anbotek
500	MEASUREMENT OF LAMPS AND LAMP SYSTEMS	S unbortes Ame	"P.en
5.1	Measurement conditions	tek unbote	P
Anbotek	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.	potek Anbotek Anbotek	Pool
5.1.1 M nD	Lamp ageing (seasoning)	botek Anbo, Ar.	N/A
tek Al	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.	Antotek Anbotek Anb	N/A
5.1.2	Test environment	h and the and the	P
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's	k Anbotek Anbotek	AnbPer
	recommendations.	ak botek Anbor	br.
5.1.3	Extraneous radiation	ator you	PAnto
tek Ar	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.	Anborek Anborek Anb	otek P p
5.1.4	Lamp operation	And borok	P
Anbotek	Operation of the test lamp shall be provided in accordance with:	Anboro Ann	And P
botek	 the appropriate IEC lamp standard, or 	An otek Anbotek	N/A
P.C.	 the manufacturer's recommendation 	pton Anbo tek unbotel	PAnbo
5.1.5	Lamp system operation	abotek Anbo	P N
lek An	The power source for operation of the test lamp shall be provided in accordance with:	Anbotek Anbotek Anb	botekP
boter	- the appropriate IEC standard, or	Anbotek Anbot	N/A
Anbotek	- the manufacturer's recommendation	hotek Anbote	Protek
5.2	Measurement procedure	tek nboren	Р
5.2.1	Irradiance measurements	ster Anbour the stek	Panbo
Anbor	Minimum aperture diameter 7mm.	tek soboten Anbo	Р
v	Maximum aperture diameter 50 mm.	nbo Alay	Not P N
An	The measurement shall be made in that position of the beam giving the maximum reading.	Anbotek Anbot An	ibotek P
ootek	The measurement instrument is adequate calibrated.	Anbotes Anbo A	AnboiPk
5.2.2	Radiance measurements	Anbort Ann Ak	Boten
5.2.2.1	Standard method	ak hotek Anbors	P
P	The measurements made with an optical system.	No Ann Stek	Banbo

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Clause	Requirement + Test	Result – Remark	Verdict
Anbotek	The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument.	ek Anbotek Anbotek Anbotek Anbotek	Antor P Anbotek Anbot
5.2.2.2	Alternative method	potek Antoo, A.	N/A
tek Ar	Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.	Anbotek Anbotek Ant	N/A
5.2.3	Measurement of source size	k hotek Anbo	Р
Anbotek	The determination of α , the angle subtended by a source, requires the determination of the 50% emission points of the source.	antek Anbotek Anbotek	Rioo'
5.2.4	Pulse width measurement for pulsed sources	Lotek Anbore Ant	N/A
ek i	The determination of Δt , the nominal pulse duration	Ann wok wotek And	N/A
hotek	of a source, requires the determination of the time during which the emission is > 50% of its peak value.	Anbotek Anbotek	inbotek
5.3	Analysis methods	k hotek Anbor	Р
5.3.1	Weighting curve interpolations	And hotek	Poo.
Anbo Anbot	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.	otek Anbole Ant Anbotek Anbotek Anbotek	, P An
5.3.2	Calculations	Anbort Ant	hote P
Anbotek	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.	Anbotek Anbotek Anbotek Anbotek	Anbotek
5.3.3	Measurement uncertainty	stek suboron And	Р
Anbot	The quality of all measurement results must be quantified by an analysis of the uncertainty.	abotek Anbotek Anbote	P ^{An}
6 ^K Ant	Lamp Classification	An Anb	Р
po ^{tek}	For the purposes of this standard it was decided that the values shall be reported as follows:	Anbotek Anbotek A	nbote ^k hote ^k
Anbotek Anbotek Anbote	 for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm 	Anbotek Anbotek Anbotek	N/A
ant Ant	 for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm 	Anbotek Anbotek Anbotek A	botek P
5.1 otek	Continuous wave lamps	netek Anbors	Ant P
5.1.1	Risk Group 0 (Exempt)	And wotek	Pore Pore
Anbor	In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:	tek Anboter Anbotek	P

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Clause	Requirement + Test	Result – Remark	Verdict
nbotek	 an actinic ultraviolet hazard (ES) within 8-hours exposure (30000 s), nor 	Anbotek Anbotek	AntPtek
And	k obotek Anboic Alli otek Anbo	tek Anbo. A. A. Anbo.	lodra d
	 a near-UV hazard (EUVA) within 1000 s, (about 16 min), nor 	potek Anbotek Anbot	P Ar
hotek l	 a retinal blue-light hazard (LB) within 10000 s (about 2,8 h), nor 	Anbotek Anbotek An	Anbotek P
Anbotek	– a retinal thermal hazard (LR) within 10 s, nor	ek nbotek Anbotet	P
Anbote	 an infrared radiation hazard for the eye (EIR) within 1000 s 	hotek Anbotek Anbotek	P
6.1.2	Risk Group 1 (Low-Risk)	hotek Anbert An-	N/A
tek p	In this group are lamps, which exceeds the limits for the except group but that does not pose:	Anbotek Anbotek An	N/A
boten	 an actinic ultraviolet hazard (ES) within 10000 s, nor 	Anbotek Anbot	N/A.
Anbotel	 a near ultraviolet hazard (EUVA) within 300 s, nor 	otek Anbolek Anbolek	N/A
Anb	- a retinal blue-light hazard (LB) within 100 s, nor	otek Anbotek Anbote	N/A
ek p	- a retinal thermal hazard (LR) within 10 s, nor	And tek anbotek Anb	N/A
lootek	 an infrared radiation hazard for the eye (EIR) within 100 s 	Anbotek Anbotek	N/A
Anbotek	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (LIR), within 100 s are in Risk Group	ek Anbotek Anbotek	N/A
5.1.3 M	Risk Group 2 (Moderate-Risk)	untek Anboren And	N/A
ek P	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:	Anbotek Anbotek Anb	N/A
potek	 an actinic ultraviolet hazard (ES) within 1000 s exposure, nor 	Anbotek Anbotek	N/A
Anbotek	 a near ultraviolet hazard (EUVA) within 100 s, nor 	tek Anborek Anborek	N/A
Anbo	 a retinal blue-light hazard (LB) within 0,25 s (aversion response), nor 	nbotek Anbotek Anbote	N/A
ootek A	 a retinal thermal hazard (LR) within 0,25 s (aversion response), nor 	Anborek Anbor An	N/A
Anbotek	 an infrared radiation hazard for the eye (EIR) within 10 s 	Anbotek Anbotek	N/A
Anbotes	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (LIR), within 10 s are in Risk Group 2.	otek Anbotek Anbotek	N/A
5.1.4	Risk Group 3 (High-Risk)	aboler hap r	N/A

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Clause	Requirement + Test	Result – Remark	Verdict
Anbotek	Lamps which exceed the limits for Risk Group 2 are in Group 3.	Anbotek Anboten	N/A
6.2	Pulsed lamps	tek Anbotek Anbo.	N/A
Anbote, Anbo	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.	potek Anbotek Anbo	N/A
nbotek A	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.	Anbotek Anbotek An	N/A
Anboten	The risk group determination of the lamp being tested shall be made as follows:	ek Anbotek Anbot	N/A
Anbo. Anbo	 a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High- Risk) 	potek Anboro Ann Anborek Anborek Anbor	N/A
nbotek	 for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group 	Anbotek Anbotek Anbotek	N/A
Anbotek Anbo	 for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission 	Annotek Anbotek Anbotek Anbotek Anbotek Anbote Anbotek Anbotek Anbote	N/A ⁴

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lause Requireme		Result – Rema			
	eighting function for assessing	ultraviolet hazards for sk	kin and eye P		
Wavelength¹ λ, nm	UV hazard function S _{υν} (λ)	Wavelength λ, nm	UV hazard functior S _{υν} (λ)		
Anbote 200 Anbo	0,030	313*	0,006		
205	0,051	315	0,003		
210	0,075	316	0,0024		
215	0,095	317 ⁰⁰	0,0020		
220	0,120	Silver 318 Moore	0,0016		
225	0,150 Martin	abote 319 Anbote	0,0012		
230	0,190	320	0,0010		
235	0,240	322	0,00067		
240	0,300	323	0,00054		
245	0,360	325	0,00050		
250	0,430	328	0,00044		
254*	0,500	Anton 330 Million	0,00041		
255	0,520	333*	0,00037		
260	0,650	335	0,00034		
265	0,810	340	0,00028		
270	1,000	345	0,00024		
abotek 275 abote	0,960	Anbo 350 atek	0,00020		
280*	0,880	355	0,00016		
285	0,770	360	0,00013		
290	0,640	365*	0,00011		
295	0,540	370	0,000093		
297*	0,460	375 and the state	0,000077		
300	0,300	Mark 380	0,000064		
303*	0,120	385	0,000053		
305 March 305	0,060	390	0,000044		
308	0,026	395	0,000036		
310	0,015	400	0,000030		

Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths.

Emission lines of a mercury discharge spectrum.

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Clause Requirement + Test Verdict Verdict				
able 4.2	Spectral weighting fun	ctions for assessing retinal hazards fr	rom broadband optical P	
1001 C	sources	Ando' All Lak	ooter Andr	
	Wavelength nm	Blue-light hazard function Β (λ)	Burn hazard function R (λ)	
Anbo	300	0,01	Anbore Ant	
50	305 🔊	0,01	atek Anbors An	
Vur	310	Nupper 0,01	Ant	
sk ar	315	0,01	and and and and a	
No.	320	0,01 Martin Martin	stek snbote	
pore.	325	0,01	poten Anbo tek	
Major	330	0,01	tek aboten And	
Ano	335	0,01	Anbo. A. tek mbore	
upote.	340	0,01	aboten Anbor A.	
	345	0,01	And aboten And	
Anbo	350	0,01	Anbo. An tak	
Me Ma	355	0,01	k botek Anbo	
be.	360	0,01	An botek	
oter	365	0,01	otek Anbort Ant	
- elt	370	0,01	k notek Anbort	
Anbo.	375	0,01	Ant Ant totel	
botek	380	0,01	0,1 ^{Mil}	
be.	385	0,013	0,13 Mar 10	
Aupo,	390	0,025	0,25	
V	395	0,05	0,5	
PU	400	0,10	Anbo 1,0 tek	
Note Note	405	0,20	and 2,0 And	
N.	410	0,40	4,0 boten	
nbore.	415	0,80	8,0	
Nor	420	0,90	9,0 ° knoo	
Anbe	425	0,95	9,5	
10 de	430	0,98	9,8	
P.,	435	1,00	10,0	
r Anl	440	1,00	10,0	
No.	445	0,97	9,7 mbore	
0,	450	0,94	9,4	
potek	455	0,90	9,0	
Ann	460	0,80	8,0	
Anbore	465	0,70	7,0	
"	470	0,62	6,2	
Aun	475	0,55	5,5	
4 and	480	0,45	4,5	
11	485	0,40	4,0	
o ^{ver}	490	0,22	2,2	
No.	495	0,16	1,6	
nbu	500-600	10 ^[(450-λ)/50]	hore 1,0	
, boten	600-700	0,001	1,0 An	
P.'	700-1050	the watek unboter	10 ^[(700-λ)/500]	
Anbo	1050-1150	boten Anbo h	0,2	
	1150-1200	tek nooten Ander	0,2·10 ^{0,02(1150-λ)}	

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1200-1400

Report No.: 68260LC10028901 Page 13 of 16 EN 62471:2008 Clause Requirement + Test Result – Remark Verdict Table 4.2 Spectral weighting functions for assessing retinal hazards from broadband optical sources P

		EN 624	71:2008		
Clause	Requirement + Test	Anb	Res	ult – Remark	Verdict
Table 5.4	Summary of the ELs for values)	the surface of the	e skin or corne	a (irradiance base	ed ^{M[®]} P
Hazard Name	Relevant equation	Wavelength range (nm)	Exposure duration (sec)	Limiting aperture rad (deg)	EL in terms of constant irradiance (W•m ⁻²)
Actinic UV skin & eye	$E_{S} = \sum E_{\lambda} \bullet S(\lambda) \bullet \Delta \lambda$	200 – 400	< 30000	1,4 (80)	30/t
Eye UV-A	ΕυνΑ = ΣΕλ • Δλ	315 – 400	≤ 1000 > 1000	1,4 (80)	10000/t 10
Blue-light small source	$E_{B} = \sum E_{\lambda} \bullet B(\lambda) \bullet \Delta \lambda$	300 – 700	≤ 100 > 100	< 0,011	100/t 1,0
Eye IR	$E_{IR} = \sum E_{\lambda} \bullet \Delta \lambda$	780 –3000	≤ 1000 > 1000	1,4 (80)	18000/t ^{0,75} 100
Skin thermal	$E_{H} = \sum E_{\lambda} \bullet \Delta \lambda$	380 – 3000	< 10	pole ¹ 2π sr _{an} bol ¹⁰	20000/t ^{0,75}

Table 5.5	Summary of the ELs for	Anbei Potek				
Hazard Name	Relevant equation	Wavelength range (nm)	Exposure duration (sec)	Field of view radians	EL in terms of constant radiance (W•m ⁻² •sr ⁻¹)	
Blue light	$L_B = \sum L_\lambda \bullet B(\lambda) \bullet \Delta \lambda$	300 – 700	0,25 – 10 10-100 100-10000 ≥ 10000	0,011•√(t/10) 0,011 0,0011•√t 0,1	10 ⁶ /t 10 ⁶ /t 10 ⁶ /t 100	
Retinal thermal	$L_{R} = \sum L_{\lambda} \bullet R(\lambda) \bullet \Delta \lambda$	380 – 1400	< 0,25 0,25 – 10	0,0017 0,011∙√(t/10)	50000/(α•t ^{0,25}) 50000/(α•t ^{0,25})	
Retinal thermal (weak visual stimulus)	L _{IR} = ∑L _λ • R(λ) • Δλ	780 – 1400	> 10	0,011	6000/α	

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EN 62471:20	800								
Clause	Requiremen	DU.	Anbo		0. M	lt – Remar		¥	Verdict
Table 6.1	Emission limits for risk groups of continuous wave lamps (α=32.2 mrad) Lamp classification group: ⊠ RG0 □ RG1 □ RG2 □ RG3								
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Resul
Actinic UV	SUV(λ)	Es	W•m-2	0.001	1.40e-05	0.003	- An	0.03	Anboten ote
Near UV	Anbore	EUVA	W•m-2	0.33	1.65e-01	33	e ^k	100	Anbo
Blue light	Β(λ)	o ^{tok} LB	W•m-2•sr-1	100	1.18e+01	10000	poter_	4000000	H
Blue light, small source	Β(λ)	EB	W•m-2	- Anbo	rek An	Anbotek	Anbor	lk <u></u> Anl	otek
Retinal thermal	R(λ)	LR	W•m-2•sr-1	7.76e+05	1.13e+03	7.76e+05	ek - Ant	1.97e+06	Anbote
Retinal	k Anbore	Ann	notek	Anbotek	Anbor	K pr	potek	Anboten	Ant
thermal, weak visual stimulus**	R(λ)	LIR A	W•m-2•sr-1	1.66e+05	0.00e+00	1.66e+05	Anbotek	1.66e+05	ptek
IR radiation, eye	Anbotek	Anbotek EIR Anbotek	W•m-2	100	0.00e+00	570	Ano	3200	Anbotek
Skin thermal	Anbote	Eh probo	W∙m-2	3.56e+03	4.51e-02	-Aupotr	otek	Anborek	<u>b</u> up

* Small source defined as one with α < 0.011 radian. Averaging field of view at 10000 s is 0.1 radian.
 ** Involves evaluation of non-GLS source.

Measurement Uncertainty Statement:

EB, Urel=2.52% (k=2) EUVA, Urel=2.52% (k=2) EIR, Urel=2.52% (k=2) Eh, Urel=2.52% (k=2) Es, Urel=15.14% (k=2) LB, Urel=2.84% (k=2) LR, Urel=2.84% (k=2)

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Test Equipment

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Equipment Name	Manufacturer	Model No.	Reference No.	Calibration Due Date
Light Radiation Safety Test System	LINKCOLOR	LRS-104	SE-1164	2022-04-28
AC power source	LINKCOLOR	LCP-500R	SE-1192	2022-04-28
DC power supply	LINKCOLOR	M8874	SE-1193	2022-04-28
Digital Power Meter	YOKOGAMA	WT310	SE-1194	2022-04-28
Temperature & Humidity meter	Zhengzhou Boyang	HTC-1	SE-423	2022-04-28
Illuminance Standard Lamp	LINKCOLOR	LCL-100	SE-1195	2022-04-28
Brightness Standard Lamp	LINKCOLOR	LCL-200	SE-1196	2022-04-28
Deuterium Lamp	LINKCOLOR	LCL-300	SE-1197	2022-04-28
Illuminometer	LINKCOLOR	ST-80C	SE-1198	2022-04-28

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Attachment A – Product Photo

*****END OF TEST REPORT*****

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