Quality Laboratory Ketrzyn



Report N° 1428919227 Mechanical strength (impact) test

Date:06-05-2015

Sample no. 2 Requested Impact value Impact 0.703	Obtained Impact value	Impact 0.70J
The luminaire tested fulfils with the required Impact?	YES NO	

Test result	PASS	FAIL	N/A
restresuit			
		F27	**



Edition 1, REV.A

Quality Laboratory Ketrzyn

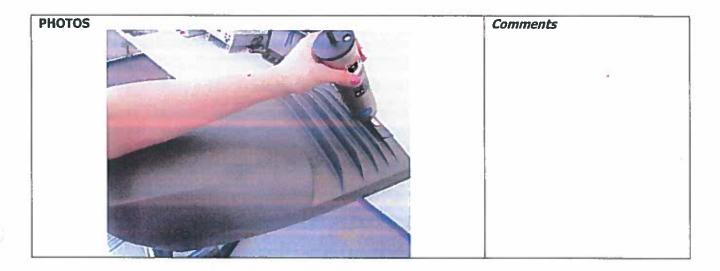


Report N° 1428919227 Mechanical strength (impact) test

Date:06-05-2015

Sample no. 3 Requested Impact value Impact 0.703	Obtained Impact value Impact 0.703
The luminaire tested fulfils with the required Impact?	YES NO

Test result	PASS	FAIL	N/A
rest result	\boxtimes		



CONCLUSION:

Edition 1, REV.A

Date of testing 05.05.2015 by Dalida Fuks

Date of validate 06.05.2015 by Dariusz Pierzchanowski

2 faks

The test results are only applicable to products subject to the laboratory and as defined in this document.

After testing, the products are returned or destroyed as indicated in the application test. The signed original test report will be archived in the case of the corresponding product

Philips Lighting Poland S.A. Kętrzyn, ul. Chrobrego 8, 11-400 Kętrzyn, Poland

Tel: +48 89 678 21 02

TEST REPORT IEC 62471

Photobiological safety of lamps and lamp systems

 Report Reference No.
 1428657749

 Date of issue
 05.05.2015

Total number of pages 15

Testing Laboratory: Philips Lighting Poland S.A. 64-920 Pila, ul. Kossaka 150

Address O/Kętrzyn ul. Chrobrego 8, 11-400 Kętrzyn, Poland

Address O/Kętrzyn ul. Chrobrego 8, 11-400 Kętrzyn, Poland

Test specification:

Standard EN 62471:2008

Test procedure : Safety

Non-standard test method...... N/A

Test Report Form No. IEC62471A
TRF Originator PRED/62471

Master TRF 2012-1

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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description...... General purpose luminaire

Trade Mark..... Philips

Manufacturer Philips Lighting Poland S.A. Pila, ul. Kossaka 150,

O/Kętrzyn 11-400 Kętrzyn, ul. Chrobrego 8, Polska

Model/Type reference MicroLuma BGP615

Ratings 220-230V 50/60Hz,

Page 2 of 15 Report No.: 1428657749

Testi	ng procedure and testing location:		
	CB Testing Laboratory:		
Test	ing location/ address:		
	Associated CB Laboratory:	•	
Test	ing location/ address:		
	Tested by (name + signature):		
	Approved by (+ signature)		
	Supervised by (+signature)		\dashv
Ш	Testing procedure: TMP		
	Tested by (name + signature):		
	Approved by (+ signature)		
Test	ing location/ address		_
	Testing procedure: WMT		-
	Tested by (name + signature):		(
	Witnessed by (+ signature)		
	Approved by (+ signature)		
Test	ing location/ address		
	Testing procedure: SMT		_
		Adam Mai	
i	Tested by (name + signature):	Adam Klej	
	Approved by (+ signature):	Dariusz Pierzchanowski	
	Supervised by (+ signature)		
Test	ing location/ address:	Quality Laboratory Philips Lighting Poland S.A. 11-400 Kętrzyn, ul. Chrobrego 8, Poland	
П	Testing procedure: RMT	11-00 Reazyii, di. Olilobiego o, Foland	-
	- ,		
	Tested by (name + signature):		
	Approved by (+ signature)		1
	Supervised by (+ signature):		
rest	ting location/ address		
			- 1

Page 3 of 15

Summary of testing:		
Tests performed (name of test and test clause):	Testing location:	
EN 62471:2008		
The test were done with positive results	Quality Laboratory	
	Philips Lighting Poland S.A.	
	O/Kętrzyn ul. Chrobrego 8,	
	11-400 Kętrzyn, Poland	
	8	
Summary of compliance with National Difference	S:	
No national differences was checked.		
Copy of marking plate:		

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Test item particulars	
Tested lamp	☐ continuous wave lamps ☐ pulsed lamps
Tested lamp system	6
Lamp classification group	exempt risk 1 risk 2 risk 3
Lamp cap	
Bulb	
Rated of the lamp	
Furthermore marking on the lamp	
Seasoning of lamps according IEC standard	N/A
Used measurement instrument	See page 17
Temperature by measurement	25 °C
Information for safety use:	
Possible test case verdicts:	
 test case does not apply to the test object 	N/A
test object does meet the requirement	P (Pass)
 test object does not meet the requirement 	F (Fail)
Testing:	
Date of receipt of test item	10.04.2015
Date (s) of performance of tests	05.05.2015
General remarks:	
The test results presented in this report relate only to to This report shall not be reproduced, except in full, with a "(See Enclosure #)" refers to additional information a "(See appended table)" refers to a table appended to to Throughout this report a comma is used as the decir List of test equipment must be kept on file and available.	out the written approval of the Issuing testing laboratory. opended to the report. he report. nal separator.
General product information:	
. ** → **.	

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
<u> </u>	EXPOSURE LIMITS		
i.1	General		P
7. 1	- 1 (A A A A A A A A A A A A A A A A A A	<u> </u>	
	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		P
	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds 10 ⁴ cd m ⁻²	see clause 4.3	P
4.3	Hazard exposure limits	-	Р
4.3.1	Actinic UV hazard exposure limit for the skin and eye		Р
	The exposure limit for effective radiant exposure is 30 J m ⁻² within any 8-hour period		N/A
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance, E _S , of the light source shall not exceed the levels defined by:		N/A
	$E_{s} \cdot t = \sum_{200}^{400} \sum_{t} E_{\lambda}(\lambda, t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 30 \qquad \text{J-m}^{-2}$		N/A
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:		N/A
	$t_{\text{max}} = \frac{30}{E_8}$ s		N/A
4.3.2	Near-UV hazard exposure limit for eye	·	
	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 1000 s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, E _{UVA} , shall not exceed 10 W m ⁻² .		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:		N/A
	<i>t</i> _{max} ≤ 10 000 s		N/A
4.3.3	Retinal blue light hazard exposure limit		
	To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, $B(\lambda)$, i.e., the blue-light weighted radiance , L_B , shall not exceed the levels defined by:		P

	IEC 62471		
Clause	Requirement + Test	Result – Remark	Verdict
4.3.8	Thermal hazard exposure limit for the skin		N/A
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		N/A
	$E_{H} \cdot t = \sum_{380}^{3000} \sum_{t} E_{\lambda} (\lambda, t) \cdot \Delta t \cdot \Delta \lambda \le 20000 \cdot t^{0.25} \qquad J \cdot m^{-2}$		N/A
5	MEASUREMENT OF LAMPS AND LAMP SYSTEM	IS	
5.1	Measurement conditions		
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		Р
5.1.1	Lamp ageing (seasoning)		
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		Р
5.1.2	Test environment		
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.		Р
5.1.3	Extraneous radiation		*
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.		Р
5.1.4	Lamp operation		
	Operation of the test lamp shall be provided in accordance with:		Р
	the appropriate IEC lamp standard, or		N/A
	- the manufacturer's recommendation		Р
5.1.5	Lamp system operation		
	The power source for operation of the test lamp shall be provided in accordance with:		
	the appropriate IEC standard, or		N/A
	the manufacturer's recommendation		Р
5.2	Measurement procedure		
5.2.1	Irradiance measurements		
	Minimum aperture diameter 7mm.		Р
	Maximum aperture diameter 50 mm.		Р
	The measurement shall be made in that position of the beam giving the maximum reading.		Р
	The measurement instrument is adequate calibrated.		Р

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01	IEC 62471	le di e	A ill
Clause	Requirement + Test	Result – Remark	Verdict
5.2.2	Radiance measurements		
5.2.2.1	Standard method		
	The measurements made with an optical system.		N/A
	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.		N/A
5.2.2.2	Alternative method		
	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.		Р
5.2.3	Measurement of source size		
	The determination of α , the angle subtended by a source, requires the determination of the 50% emission points of the source.	, == .	N/A
5.2.4	Pulse width measurement for pulsed sources	Continuous source	
	The determination of Δt , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.		N/A
5.3	Analysis methods		
5.3.1	Weighting curve interpolations		N/A
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.	see table 4.1	N/A
5.3.2	Calculations		N/A
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.		N/A
5.3.3	Measurement uncertainty		N/A
	The quality of all measurement results must be quantified by an analysis of the uncertainty.	see Annex C in the norm	N/A
6	LAMP CLASSIFICATION		
<u>-</u>	For the purposes of this standard it was decided that the values shall be reported as follows:	see table 6.1	Р
	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		P

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm		N/A
6.1	Continuous wave lamps		
6.1.1	Except Group		
	In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		
	 an actinic ultraviolet hazard (E_s) within 8-hours exposure (30000 s), nor 		Р
	 a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor 		Р
	 a retinal blue-light hazard (L_B) within 10000 s (about 2,8 h), nor 		Р
-	 a retinal thermal hazard (L_R) within 10 s, nor 		N/A
	 an infrared radiation hazard for the eye (E_{IR}) within 1000 s 		N/A
6.1.2	Risk Group 1 (Low-Risk)		
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		N/A
	 an actinic ultraviolet hazard (E_S) within 10000 s, nor 		N/A
-	 a near ultraviolet hazard (E_{UVA}) within 300 s, nor 		N/A
	 a retinal blue-light hazard (L_B) within 100 s, nor 		N/A
	- a retinal thermal hazard (L _R) within 10 s, nor		N/A
	 an infrared radiation hazard for the eye (E_{IR}) within 100 s 		N/A
-	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L _{IR}), within 100 s are in Risk Group 1.		N/A
6.1.3	Risk Group 2 (Moderate-Risk)		N/A
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N/A
	 an actinic ultraviolet hazard (E_s) within 1000 s exposure, nor 		N/A
	- a near ultraviolet hazard (E _{UVA}) within 100 s, nor		N/A
	 a retinal blue-light hazard (L_B) within 0,25 s (aversion response), nor 		N/A
	 a retinal thermal hazard (L_R) within 0,25 s (aversion response), nor 		N/A
	an infrared radiation hazard for the eye (E _{IR}) within 10 s		N/A
		· · · · · · · · · · · · · · · · · · ·	

IEC 62471	
Requirement + Test Result - Remark	Verdict
Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L _{IR}), within 10 s are in Risk Group 2.	N/A
Risk Group 3 (High-Risk)	N/A
Lamps which exceed the limits for Risk Group 2 are in Group 3.	N/A
Pulsed lamps	N/A
Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.	N/A
A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.	N/A
The risk group determination of the lamp being tested shall be made as follows:	N/A
a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)	N/A
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	N/A
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	N/A
	Requirement + Test Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L _{IR}), within 10 s are in Risk Group 2. Risk Group 3 (High-Risk) Lamps which exceed the limits for Risk Group 2 are in Group 3. Pulsed lamps Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s. A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer. The risk group determination of the lamp being tested shall be made as follows: - a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk) - 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 - for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the

		IEC 62471		
Clause	Requirement + Test		Result – Remark	Verdict

Wavelength [,] λ, nm	UV hazard function S _ω (λ)	Wavelength λ, nm	UV hazard function S _ω (λ)
200	0,030	313*	0,006
205	0,051	315	0,003
210	0,075	316	0,0024
215	0,095	317	0,0020
220	0,120	318	0,0016
225	0,150	319	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	330	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
275	0,960	350	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	0,000077
300	0,300	380	0,000064
303*	0,120	385	0,000053
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.

		IEC 62471		
Clause	Requirement + Test		Result – Remark	Verdict

300 0,01 305 0,01 310 0,01 315 0,01 320 0,01 325 0,01 330 0,01 335 0,01 330 0,01 335 0,01 3340 0,01 345 0,01 355 0,01 355 0,01 366 0,01 367 0,01 370 0,01 388 0,01 388 0,01 388 0,01 388 0,01 389 0,025 399 0,025 399 0,025 390 0,025 391 0,001 405 0,20 410 0,40 415 0,80 420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,97 450 0,94 455 0,99 466 0,99 467 0,99 468 0,99 469 0,99 469 0,99 460 0,80 465 0,70 470 0,62 475 0,65 480 0,45 485 0,40 490 0,222 495 0,16 500-600 10 (((1997-1795)))	urn hazard function R (λ)
310 0,01 315 0,01 320 0,01 320 0,01 325 0,01 330 0,01 335 0,01 340 0,01 345 0,01 355 0,01 355 0,01 355 0,01 360 0,01 365 0,01 377 0,01 388 0,01 385 0,01 390 0,025 395 0,05 400 0,10 405 0,20 410 0,40 415 0,80 420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,97 450 0,94 455 0,97 450 0,94 455 0,90 465 0,70 470 0,62 475 0,55 480 0,45 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10[(450-14)23]	
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315	
320 0,01 325 0,01 330 0,01 335 0,01 340 0,01 345 0,01 345 0,01 350 0,01 350 0,01 355 0,01 366 0,01 365 0,01 370 0,01 375 0,01 380 0,01 385 0,01 380 0,01 385 0,01 380 0,01 385 0,01 380 0,01 385 0,01 380 0,01 385 0,01 385 0,01 380 0,025 395 0,05 400 0,10 405 0,20 410 0,40 415 0,80 420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 445 0,97 450 0,94 455 0,97 450 0,94 455 0,90 466 0,80 466 0,80 466 0,80 466 0,80 466 0,80 466 0,80 467 0,62 475 0,65 480 0,45 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^{((450-1)/150)} 600-700 0,001	
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390 0,025 395 0,05 400 0,10 405 0,20 410 0,40 415 0,80 420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10[(450-A)F50] 600-700 0,001	0,1
395 0,05 400 0,10 405 0,20 410 0,40 415 0,80 420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10((490-A)750) 600-700 0,001	0,13
395 0,05 400 0,10 405 0,20 410 0,40 415 0,80 420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10((450-A)750) 600-700 0,001	0,25
400 0,10 405 0,20 410 0,40 415 0,80 420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10[(450-Ay50)] 600-700 0,001 700-1050 0,001	0,5
410 0,40 415 0,80 420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050 0,001	1,0
415 0,80 420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^{((450-A)/50)} 600-700 0,001 700-1050	2,0
420 0,90 425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050	4,0
425 0,95 430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^{((450-A)/50)} 600-700 0,001 700-1050	8,0
430 0,98 435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10((450-A)/50) 600-700 0,001 700-1050	9,0
435 1,00 440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^{((450-A)/50)} 600-700 0,001 700-1050	9,5
440 1,00 445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050	9,8
445 0,97 450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^{((450-A)/50)} 600-700 0,001 700-1050	10,0
450 0,94 455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^{((450-A)/50)} 600-700 0,001 700-1050	10,0
455 0,90 460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050	9,7
460 0,80 465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050	9,4
465 0,70 470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050	9,0
470 0,62 475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050 0	8,0
475 0,55 480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-λ)/50] 600-700 0,001 700-1050	7,0
480 0,45 485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050	6,2
485 0,40 490 0,22 495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050 0	5,5
490 0,22 495 0,16 500-600 10 ^[(45U-A)/50] 600-700 0,001 700-1050	4,5
495 0,16 500-600 10 ^[(450-A)/50] 600-700 0,001 700-1050	4,0
500-600 10 ^{((450-A)/50)} 600-700 0,001 700-1050	2,2
600-700 0,001 700-1050	1,6
700-1050	1,0
	1,0
4050 4450	10[(700-A)/500]
1050-1150	0,2
1150-1200 1200-1400	0,2·10 ^{0,02} (1150-λ) 0,02

		IEC 62471		
Clause	Requirement + Test		Result – Remark	Verdict

Table 5.4	Summary of the ELs for the	e surface of the sl	kin or cornea (irradiance ba	sed values)
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	$E_S = \sum E_\lambda \cdot S(\lambda) \cdot \Delta \lambda$	200 – 400	< 30000	1,4 (80)	30/t
Eye UV-A	$E_{UVA} = \sum E_{\lambda} \cdot \Delta \lambda$	315 – 400	≤1000 >1000	1,4 (80)	10000/t 10
Blue-light small source	$E_B = \sum E_A \bullet B(A) \bullet \Delta A$	300 – 700	≤100 >100	< 0,011	100/t 1,0
Eye IR	$E_{IR} = \sum E_{\lambda} \cdot \Delta \lambda$	780 –3000	≤1000 >1000	1,4 (80)	18000/t ^{0,75} 100
Skin thermal	$E_H = \sum E_{\lambda} \cdot \Delta \lambda$	380 – 3000	< 10	2π sr	20000/t ^{0,75}

Table 5.5 Su	mmary of the ELs for th	e retina (radian	ce based valu	es)	
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	$L_{B} = \sum L_{A} \cdot B(\lambda) \cdot \Delta \lambda$	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	$L_{R} = \sum L_{\lambda} \cdot R(\lambda) \cdot \Delta \lambda$	380 – 1400	< 0,25 0,25 – 10	0,0017 0,011•√(₺10)	50000/(α•t ^{0,25}) 50000/(α•t ^{0,25})
Retinal thermal (weak visual stimulus)	$L_{IR} = \sum L_{\lambda} \bullet R(\lambda) \bullet \Delta \lambda$	780 – 1400	> 10	0,011	6000/α

	Verdict	
2471	Result – Remark	
IEC 62471	ent + Test >	
	Clause	

Table 6.1	Emission limit	Emission limits for risk groups of continuous wave lamps	ips of continu	ous wave lar	sdu				В	
	13	-		1 10 10		Emission M	Emission Measurement			
Risk	Action	Symbol	Units	Exe	Exempt	Low	Low risk	Mod	Mod risk	
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	S _{UV} (A)	ព្	W•m ⁻²	0,001	at vide has develo	600,0	•	60,03	•	
Near UV		Euva	W•m⁻²	10	0,0037	33	1	100		
Blue light	B(A)	LB	W•m⁻²•sr⁻¹	100	25	10000		4000000		
Blue light, small source	B(A)	E	W•m·²	1,0*	N/A	1,0	N/A	400	N/A	
Retinal	R(A)	LR	W•m²•sr⁴	28000/α	N/A	28000/α	N/A	71000/a	N/A	
Retinal thermal, weak visual stimulus**	R(A)	Liñ	W•m⁻²sr⁻¹	6000/α	N/A	6000/a	N/A	6000/a	N/A	
IR radiation, eye		Eir	W•m-²	100	N/A	570	N/A	3200	N/A	
* Small	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	d as one with of non-GLS so	a < 0,011 rac ource	Jian. Averagi	ng field of vie	ew at 10000 s	is 0,1 radiar	ا ا		

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Furthermore remarks:

Measuring instrument

Name	Maker	Model No.
Hazard Lightmeter	Gigahertz-optic	X1-3

Čestné prohlášení

Dodavatel:

ELPIK s.r.o.

Nerudova 470/1

767 01 Kroměříž

Čestně prohlašujeme, na svou výlučnou odpovědnost, že před vlastní realizací stavby provedeme optimalizaci a vyprecizování světelně-technického řešení v souladu s požadavky Zadavatele, které předložíme Zadavateli ke schválení/připomínkování. Řešení obsažené v této nabídce co nejpřesněji kopíruje referenční světelně-technický návrh, ovšem s kvalitnějšími svítidly (dle našeho názoru).

V Kroměříži, dne 19.8.2016

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767 01 Kroměříž
IČ 27687538 (2)
DIČ CZ27667538

a podpis

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