

TEST REPORT

for

Zhongshan MLS Electronic Co., Ltd.

No.1 Mulinsen Avenue, Xiaolan Township, Zhongshan, Guangdong, China

LED Package

Model: LV2835XXXX03X-XXX

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ20030010a

Test specifications:

Date of Receipt : Mar. 04, 2020

Date of Test : Mar. 05, 2020

Reference Standard : IEC 62471:2006 Photobiological safety of lamps and lamp systems

Test Report Form No. EN 62471: 2008 Photobiological safety of lamps and lamp systems
IEC TR 62778:2014 Application of IEC 62471 for the assessment of blue
light hazard to light sources and luminaires

Test Report Form No : IEC607 TRF 62471B:2018 Test Report Form applies to: IEC 62471:2006

Review by:

April Zou

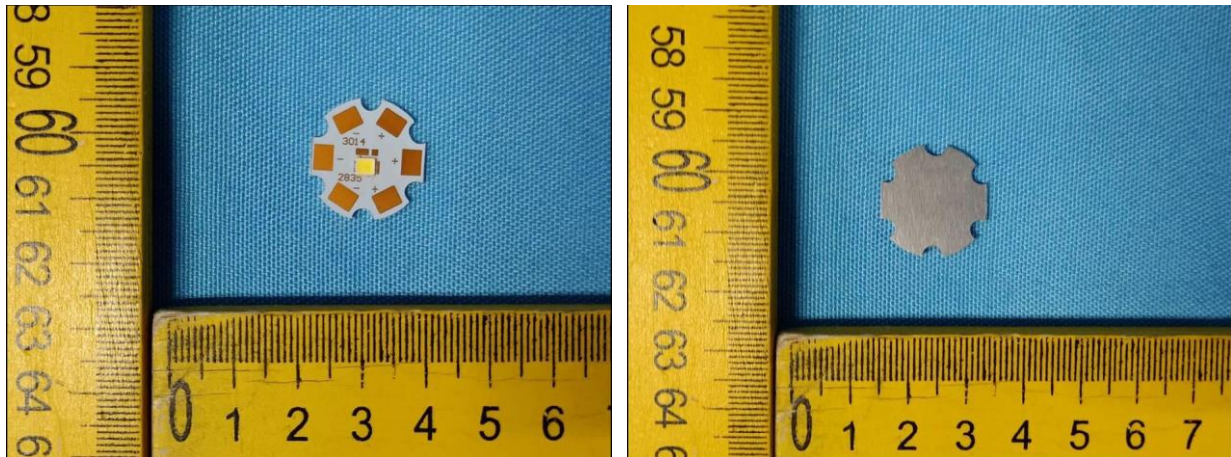
Engineer: April Zou
Mar. 24, 2020



Approved by:

Jim Zhang

Manager: Jim Zhang
Mar. 24, 2020



Overview of the sample

Equipment Under Test(EUT)

Name	: LED Package
Model	: LV2835XXXX03X-XXX
Electrical Ratings	: 3V, 60mA, 6500K
Manufacturer	: Zhongshan MLS Electronic Co., Ltd.
Address	: No.1 Mulinsen Avenue, Xiaolan Township, Zhongshan, Guangdong, China

SUMMARY

The tested sample LV2835XXXX03X-XXX is in compliance with the requirements of Exempt Group according to IEC 62471:2006, i.e. the tested luminaries does not pose:

1. An actinic ultraviolet hazard (E_S) within 8-hours exposure (30000 s), nor
2. A near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor
3. A retinal blue-light hazard (L_B) within 10000 s (about 2.8 h), nor
4. A retinal thermal hazard (L_R) within 10 s, nor
5. An infrared radiation hazard for the eye (E_{IR}) within 1000 s

The tested sample LV2835XXXX03X-XXX is in compliance with the requirements of RG0 at 200mm according to IEC TR 62778:2014;

Spectroradiometer was used measurement and the ambient temperature was 25 °C;

P (Pass) was used to the test object which does meet the requirement;

F (Fail) was used to the test object which does not meet the requirement;

IEC 62471				
Clause	Requirement + Test		Result – Remark	Verdict
4	EXPOSURE LIMITS			P
4.1	General			P
	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 $10^4 \text{ cd} \cdot \text{m}^{-2}$		see clause 4.3	P
4.3	Hazard exposure limits			P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		LED lighting source	P
	The exposure limit for effective radiant exposure is $30 \text{ J} \cdot \text{m}^{-2}$ within any 8-hour period			P
	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:			P
	$E_s \cdot t = \sum_{200}^{400} \sum_t E_\lambda(\lambda, t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \leq 30 \quad \text{J} \cdot \text{m}^{-2}$			P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:			P
	$t_{\max} = \frac{30}{E_s} \quad \text{s}$			P
4.3.2	Near-UV hazard exposure limit for eye			P
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed $10000 \text{ J} \cdot \text{m}^{-2}$ 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 $10 \text{ W} \cdot \text{m}^{-2}$			P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:			P
	$t_{\max} \leq \frac{10\,000}{E_{UVA}} \quad \text{s}$			P
4.3.3	Retinal blue light hazard exposure limit			P
	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
	$L_B \cdot t = \sum_{300}^{700} \sum_t L_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \leq 10^6 \quad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$		for $t \leq 10^4 \text{ s}$	$t_{\max} = \frac{10^6}{L_B}$ N/A

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	$L_B = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2} \cdot sr^{-1}$	for $t > 10^4$ s	P
4.3.4	Retinal blue light hazard exposure limit - small source		N/A
	Thus the spectral irradiance at the eye E_{λ} , weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by:	see table 4.2	N/A
	$E_B \cdot t = \sum_{300}^{700} \sum_t E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad J \cdot m^{-2}$	for $t \leq 100$ s	N/A
	$E_B = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \quad W \cdot m^{-2}$	for $t \leq 100$ s	N/A
4.3.5	Retinal thermal hazard exposure limit		P
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L_{λ} , weighted by the burn hazard weighting function $R(\lambda)$ (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:		P
	$L_R = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50\,000}{\alpha \cdot t^{0.25}} \quad W \cdot m^{-2} \cdot sr^{-1}$	$(10 \mu s \leq t \leq 10s)$	P
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		P
	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, L_{IR} , as viewed by the eye for exposure times greater than 10 s shall be limited to:		P
	$L_{IR} = \sum_{780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6\,000}{\alpha} \quad W \cdot m^{-2} \cdot sr^{-1}$	$t > 10$ s	P
4.3.7	Infrared radiation hazard exposure limits for the eye		P
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, E_{IR} , over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:		N/A
	$E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 18\,000 \cdot t^{-0.75} \quad W \cdot m^{-2}$	$t \leq 1000$ s	N/A
	For times greater than 1000 s the limit becomes:		P
	$E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2}$	$t \leq 1000$ s	P
4.3.8	Thermal hazard exposure limit for the skin		P
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		P
	$E_H \cdot t = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda, t) \cdot \Delta\lambda \leq 20\,000 \cdot t^{0.25} \quad J \cdot m^{-2}$		P

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
5	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		P
5.1	Measurement conditions		P
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification	The distance between lighting surface of the light and detector was 200mm during the test	P
5.1.1	Lamp ageing (seasoning)	Aging time of the sample was 1 hours	P
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard		N/A
5.1.2	Test environment		P
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations	Test condition 3/6/9/18/36/54Vdc Head of LED lamp Paralleled topical table for measurement and the measuring at 200mm distance	P
5.1.3	Extraneous radiation		P
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results		P
5.1.4	Lamp operation		N/A
	Operation of the test lamp shall be provided in accordance with:		N/A
	– the appropriate IEC standard, or		N/A
	– the manufacturer's recommendation		N/A
5.1.5	Lamp system operation		P
	The power source for operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC standard, or		N/A
	– the manufacturer's recommendation		P
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm		P
	Maximum aperture diameter 50 mm		P
	The measurement shall be made in that position of the beam giving the maximum reading		P
	The measurement instrument is adequate calibrated		P
5.2.2	Radiance measurements		P

5.2.2.1	Standard method		P
	The measurements made with an optical system		P
	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		P
5.2.2.2	Alternative method		N/A
	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		N/A
5.2.3	Measurement of source size		P
	The determination of α , the angle subtended by a source, requires the determination of the 50% emission points of the source		P
5.2.4	Pulse width measurement for pulsed sources		N/A
	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		P
5.3.1	Weighting curve interpolations		P
	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	P
5.3.2	Calculations		P
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy		P
5.3.3	Measurement uncertainty		P
	The quality of all measurement results must be quantified by an analysis of the uncertainty.	see Annex C in the norm	P

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Clause	Requirement + Test	Result – Remark	Verdict
6	LAMP CLASSIFICATION		P
	For the purposes of this standard it was decided that the values shall be reported as follows:	see table 6.1	P
	– 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	The distance between lighting surface of the light and detector was 200mm during the test	P
	– 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		N/A
6.1.1	Exempt Group		P
	In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		P
	– an actinic ultraviolet hazard (E_S) within 8-hours exposure (30000 s), nor		P
	– a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor		P
	– a retinal blue-light hazard (L_B) within 10000 s (about 2.8 h), nor		P
	– a retinal thermal hazard (L_R) within 10 s, nor		P
	– an infrared radiation hazard for the eye (E_{IR}) within 1000 s		P
6.1.2	Risk Group 1 (Low-Risk)		N/A
	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
	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
6.1.4	Risk Group 3 (High-Risk)		N/A
	Lamps which exceed the limits for Risk Group 2 are in Group 3		N/A
6.2	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

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Clause	Requirement + Test	Result – Remark	Verdict
Table 4.1	Spectral weighting function for assessing ultraviolet hazards for skin and eye		P
Wavelength ¹ λ , nm	UV hazard function $S_{UV}(\lambda)$	Wavelength λ , nm	UV hazard function $S_{UV}(\lambda)$
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.			

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Clause	Requirement + Test	Result – Remark	Verdict
Table 4.2	Spectral weighting functions for assessing retinal hazards from broadband optical sources		P
Wavelength1 λ , nm	Blue-light hazard function B (λ)	Burn hazard function R (λ)	
300	0.01		
305	0.01		
310	0.01		
315	0.01		
320	0.01		
325	0.01		
330	0.01		
335	0.01		
340	0.01		
345	0.01		
350	0.01		
355	0.01		
360	0.01		
365	0.01		
370	0.01		
375	0.01		
380	0.01	0.1	
385	0.013	0.13	
390	0.025	0.25	
395	0.05	0.5	
400	0.10	1.0	
405	0.20	2.0	
410	0.40	4.0	
415	0.80	8.0	
420	0.90	9.0	
425	0.95	9.5	
430	0.98	9.8	
435	1.00	10.0	
440	1.00	10.0	
445	0.97	9.7	
450	0.94	9.4	
455	0.90	9.0	
460	0.80	8.0	
465	0.70	7.0	
470	0.62	6.2	
475	0.55	5.5	
480	0.45	4.5	
485	0.40	4.0	
490	0.22	2.2	
495	0.16	1.6	
500-600	$10^{[(450-\lambda)/50]}$	1.0	
600-700	0.001	1.0	
700-1050		$10^{[(700-\lambda)/500]}$	
1050-1150		0.2	
1150-1200		$0.2 \cdot 10^{0.02(1150-\lambda)}$	
1200-1400		0.02	

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Clause	Requirement + Test		Result – Remark		Verdict
Table 5.4	Summary of the ELs for the surface of the skin or cornea (irradiance based values)				P
Hazard Name	Relevant equation	Wavelength range nm	Exposure duration sec	Limiting aperture rad (deg)	EL in terms of Constant irradiance $W \cdot m^{-2}$
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	$E_B = \sum E_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	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	Summary of the ELs for the retina (radiance based values)				P
Hazard Name	Relevant equation	Wavelength range nm	Exposure duration sec	Field of view radians	EL in terms of constant radiance $(W \cdot m^{-2} \cdot sr^{-1})$
Blue light	$L_B = \sum L_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	0.25 – 10 10-100 100-10000 ≥ 10000	$0.011 \cdot \sqrt{(t/10)}$ 0.011 $0.0011 \cdot \sqrt{t}$ 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 $0.011 \cdot \sqrt{(t/10)}$	$50000/(\alpha \cdot t^{0.25})$ $50000/(\alpha \cdot t^{0.25})$
Retinal Thermal (weak visual stimulus)	$L_{IR} = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	780 – 1400	> 10	0.011	6000/α

IEC 62471									
Clause	Requirement + Test			Result - Remark					Verdict
Table 6.1	Emission limits for risk groups of continuous wave lamps								P
Risk	Action Spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low Risk		Mod Risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	E_s	$W \cdot m^{-2}$	0.001	5.691E-06	0.003	/	0.03	/
Near UV		E_{UVA}	$W \cdot m^{-2}$	10	8.952E-02	33	/	100	/
Blue light	$B(\lambda)$	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	100	2.805E+00	10000	/	4000000	/
Blue light, Small source	$B(\lambda)$	E_B	$W \cdot m^{-2}$	1.0*	/	1.0	/	400	/
Retinal Thermal	$R(\lambda)$	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ α	9.219E+02	28000/ α	/	71000/ α	/
Retinal Thermal, Weak Visual Stimulus**	$R(\lambda)$	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	6000/ α	0.000E+00	6000/ α	/	6000/ α	/
IR Radiation, Eye	/	E_{IR}	$W \cdot m^{-2}$	100	0.000E+00	570	/	3200	/
Angular subtense of apparent source: $\alpha=15.08\text{mrad}$ (LV2835XXXX03X-XXX)									
* Small source defined as one with $\alpha < 0.011$ radian. Averaging field of view at 10000 s is 0.1 radian.									
** Involves evaluation of non-GLS source									

Attachment 1: EN 62471			
Clause	Requirement + Test	Result – Remark	Verdict
ATTACHMENT TO TEST REPORT IEC 62471 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Photobiological safety of lamps and lamps systems			
Differences according to EN 62471:2008			
Attachment Form No.: EU_GD_IE62471B			
Attachment Originator OVE			
Master Attachment 2019-01-24			
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	CENELEC COMMON MODIFICATIONS (EN)		P
4	EXPOSURE LIMITS		P
	Contents of the whole Clause 4 of IEC 62471:2006 moved into a new informative Annex ZB		/
	Clause 4 replaced by the following:		P
	Limits of the Artificial Optical Radiation Directive (2006/25/EC) have been applied instead of those fixed in IEC 62471:2006	See appended Table 6.1	P
4.1	General		P
	First paragraph deleted		/

Attachment 1: EN 62471

Clause	Requirement + Test			Result – Remark				Verdict	
Table 6.1	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								P
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	S _{UV} (λ)	E _s	W•m ⁻²	0.001	5.691E-06	0.003	/	0.03	/
Near UV		E _{UVA}	W•m ⁻²	0.33	8.952E-02	33	/	100	/
Blue light	B(λ)	L _B	W•m ⁻² •sr ⁻¹	100	2.805E+00	10000	/	4000000	/
Blue light, small source	B(λ)	E _B	W•m ⁻²	0.01*	/	1.0	/	400	/
Retinal thermal	R(λ)	L _R	W•m ⁻² •sr ⁻¹	28000/α	9.219E+02	28000/α	/	71000/α	/
Retinal thermal, weak visual stimulus**	R(λ)	L _{IR}	W•m ⁻² •sr ⁻¹	545000 0.0017≤ α ≤ 0.011	/				
				6000/α 0.011≤ α ≤ 0.1	α=15,08mrad, 0.000E+00				
IR radiation, eye		E _{IR}	W•m ⁻²	100	0.000E+00	570	/	3200	/
* Small source defined as one with α < 0.011 radian. Averaging field of view at 10000 s is 0.1 radian. (LV2835XXXX03X-XXX)									
** Involves evaluation of non-GLS source									
NOTE: The action functions: see Table 4.1 and Table 4.2									
The applicable aperture diameters: see 4.2.1									
The limitations for the angular subtenses: see 4.2.2									
The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.									

Attachment 2: IEC TR 62778			
Clause	Requirement + Test	Result – Remark	Verdict
7	MEASUREMENT INFORMATION FLOW		P
7.1	Basic flow		P
	‘Law of conservation of luminance’ applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		N/A
	In case E _{thr} value for RG2 was established the peak value was derived from angular light distribution		N/A
7.2	Conditions for the radiance measurement		P
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
7.3	Special cases (I): Replacement by a lamp or LED module of another type		N/A
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
7.4	Special cases (II): Arrays and clusters of primary light sources		N/A
	LED package is evaluated as:	☐ RG0 unlimited ☐ RG1 unlimited	N/A
	E _{thr} of LED package applies to array		N/A
8	RISK GROUP CLASSIFICATION		P
	Risk group achieved:		P
	- Risk Group 0 unlimited		P
	- Risk Group 1 unlimited		P
	- E _{thr} (lx) : Distance to reach RG1 (m) :	See below table	N/A
	TABLE: Spectroradiometric measurement		P
	Measurement performed on:	☒ LED package ☐ LED module ☐ Lamp ☐ Luminaire ☐ LED	/
	Model number	LV2835XXXX03X-XXX	/
	Test voltage (V)	3Vdc	/

Quantity Assured					
	Test current (mA)		60mA	/	
	Test frequency (Hz)		N/A	/	
	Ambient temperature (°C)		25	/	
	Measurement distance		☒ 20 cm ☐	/	
	Source size		☒ Non-small ☐ Small	/	
	Field of view		☐ 100 mrad ☒ 11 mrad ☐ 1.7 mrad (for small sources)	/	
Item		Symbol	Units	Result	Remark
Correlated Colour Temperature		CCT	K	/	
x/y Colour Coordinates		/	/	/	
Blue Light Hazard Radiance		L _B	W/(m ² •sr ¹)	2.805E+00	
Blue Light Hazard Irradiance		E _B	W/m ²	/	
Luminance		L	cd/m ²	4.658E+04	
Illuminance		E	lx	/	
RG0					

*** End of Report ***

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