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Date of issue	2016-05-19

Testing laboratory	Bay Area Compliance Laboratories Corp. (Dongguan)
Address	No.69 Pulong Village Puxinhu Industry Zone Tangxia,Dongguan, China.
Testing location	Same as above

Applicant	Guangzhou Hongli Opto-Electronic Co., Ltd.
Address	No.1, Xianke Yi Road, Huadong Town, Huadu District, Guangzhou, China

Standard	IEC 62471:2006
Test sample(s) received.....	2016-05-19
Test in period.....	2016-05-19
Procedure deviation	N.A.
Non-standard test method	N.A.

The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the specific product described herein. It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

Type of test object	LED Package
Trademark	None

IEC 62471			
Clause	Requirement + Test	Result - Remark	Verdict
	$L_B \cdot t = L(\lambda, t) \cdot B(\lambda) \cdot t \leq 10^6 \text{ J} \cdot \text{m}^{-2} \cdot \text{sr}$		N
	$L_B = L_{\lambda} \cdot B(\lambda) \leq 100 \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	$L_B = 9.7 \times 10^3 \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	P
4.3.4	Retinal blue light hazard exposure limit - small source	$= 0.0065 \text{ rad}$	P
	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		P
	$E \cdot t = E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot t \leq 100 \text{ J} \cdot \text{m}^{-2}$		N
	$E_B = E_{\lambda} \cdot B(\lambda) \leq 1 \text{ W} \cdot \text{m}^{-2}$	$E_B = 1 \text{ W} \cdot \text{m}^{-2}$	P
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
	$L_R = \sum_{\lambda=400}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50000}{0.25} \cdot \frac{1}{380} \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	$L_R = 1.2 \times 10^5 \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	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, LIR, as viewed by the eye for exposure times greater than 10 s shall be limited to:		P
	$L_{IR} = \sum_{\lambda=780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6000}{\alpha} \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	$L_{IR} = 3.9 \times 10^2 \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	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, EIR, over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:		N

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	For the purposes of this standard it was decided that the values shall be reported as follows:		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	LED light for general lighting: 200 mm	P
	– for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm		N
6.1	Continuous wave lamps		P
6.1.1	Exempt Group		N
	In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		N
	– an actinic ultraviolet hazard (ES) within 8-hours exposure (30000 s), nor		N
	– a near-UV hazard (EUVA) within 1000 s, (about 16 min), nor		N
	– a retinal blue-light hazard (LB) within 10000 s (about 2,8 h), nor		N
	– a retinal thermal hazard (LR) within 10 s, nor		N
	– an infrared radiation hazard for the eye (EIR) within 1000 s		N
6.1.2	Risk Group 1 (Low-Risk)		P
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		P
	– an actinic ultraviolet hazard (ES) within 10000 s, nor		P
	– a near ultraviolet hazard (EUVA) within 300 s, nor		P
	– a retinal blue-light hazard (LB) within 100 s, nor		P
	– a retinal thermal hazard (LR) within 10 s, nor		P
	– an infrared radiation hazard for the eye (EIR) within 100 s		P
	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 1.		P
6.1.3	Risk Group 2 (Moderate-Risk)		N
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N
	– an actinic ultraviolet hazard (ES) within 1000 s exposure, nor		N
	– a near ultraviolet hazard (EUVA) within 100 s, nor		N
	– a retinal blue-light hazard (LB) within 0,25 s (aversion response), nor		N
	– a retinal thermal hazard (LR) within 0,25 s (aversion response), nor		N

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Clause	Requirement + Test	Result - Remark	Verdict

Spectral weighting functions for assessing retinal hazards from broadband optical sources		-
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

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Summary of the ELs for the surface of the skin or cornea (irradiance based values)					
Actinic UV skin & eye	$E_s = E \cdot S(\cdot)$	200 – 400	< 30000	1,4 (80)	30/t
Eye UV-A	$E_{UVA} = E \cdot \cdot$	315 – 400	1000 >1000	1,4 (80)	10000/t 10
Blue-light small source	$E_B = E \cdot B(\cdot)$	300 – 700	100 >100	< 0,011	100/t 1,0
Eye IR	$E_{IR} = E \cdot \cdot$	780 – 3000	1000 >1000	1,4 (80)	18000/t ^{0,75} 100
Skin thermal	$E_H = E \cdot \cdot$	380 – 3000	< 10	2 sr	20000/t ^{0,75}

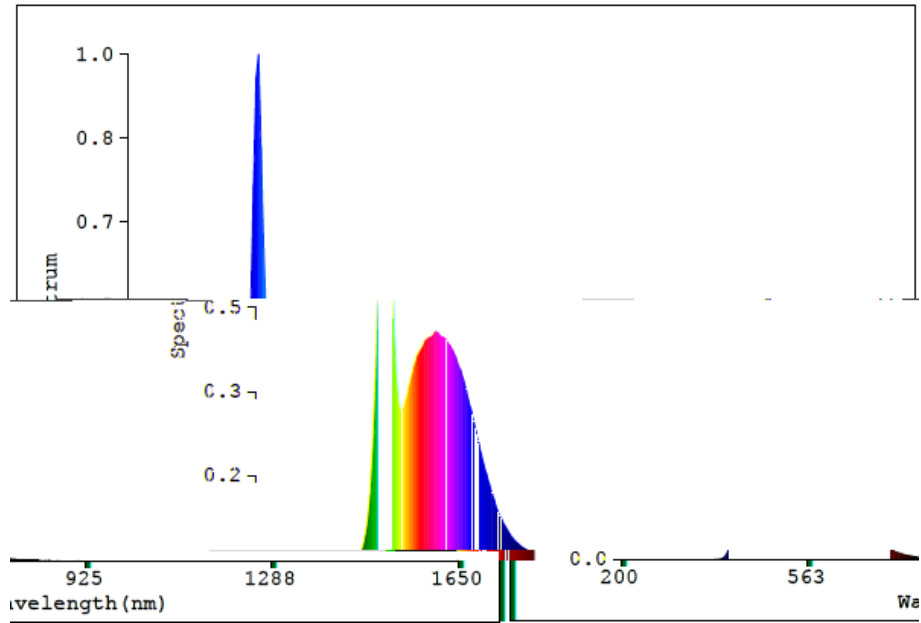
Summary of the ELs for the retina (radiance based values)					
Blue light	$L_B = L \cdot B(\cdot) \cdot$	300 – 700	0,25 – 10 10-100 100-10000 10000	0,011• (t/10) 0,011 0,0011• t 0,1	10 ⁶ /t 10 ⁶ /t 10 ⁶ /t 100
Retinal thermal	$L_R = L \cdot R(\cdot) \cdot$	380 – 1400	< 0,25 0,25 – 10	0,0017 0,011• (t/10)	50000/(•t ^{0,25}) 50000/(•t ^{0,25})
Retinal thermal (weak visual stimulus)	$L_{IR} = L \cdot R(\cdot) \cdot$	780 – 1400	> 10	0,011	6000/

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Clause	Requirement + Test	Result - Remark	Verdict
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Table 6.1	Emission limits for risk groups of continuous wave lamps base on Directive(2006/25/EC)								P
Risk	Action spectrum	Units	Symbol	Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	Suv()	W.m ⁻²	E _S	0.001	-	0.003	3.5×10 ⁻⁶	0.03	-
Near UV		W.m ⁻²	E _{UVA}	10	-	33	1.3×10 ⁻³	100	-
Blue light	B()	W.m ⁻² .sr ⁻¹	L _B	100	-	10000	9.7×10 ³	4000000	-
Blue light,small source	B()	W.m ⁻²	E _B	1*	-	0.48	1	400	-
Retinal thermal	R()	W.m ⁻² .sr ⁻¹	L _R	28000/ =0.0065	-	28000/ =0.0065	1.2×10 ⁵	71000/ =0.0065	-
Retinal thermal, Weak visual stimulus**	R()	W.m ⁻² .sr ⁻¹	L _{IR}	6000/ =0.0065	-	6000/ =0.0065	3.9×10 ²	28000/ =0.0065	-
IR radiation Eye		W.m ⁻²	E _{IR}	100	-	570	0	3200	-

* Small source defined as one with < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.
** Involves evaluation of non-GLS source





广州市鸿利光电股份有限公司

Declaration of Alteration

To Whom It May Concern,

We, Guangzhou Hongli Opto-Electronic Co.,Ltd. , hereby declare that there are some differences between our Multiple Models and testing products as follows:

(Please refer to our General Policy)

Name: [Redacted]
 Products: [Redacted]
 Description: [Redacted]
 Manufacturer: Guangzhou Hongli Opto-Electronic Co.,Ltd.
 Project No: [Redacted]

Testing Products	Multiple Models	Differences Description	Details
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		CC1:2700K; Ra:80;
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		Chip name:D5; Glue:01
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		CC1:3000K; Ra:80;
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		Chip name:D4; Glue:01
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		CC1:4000K; Ra:80;
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01	Just in CCT	Chip name:D4; Glue:01
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		CC1:5000K; Ra:80;
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		Chip name:D5; Glue:01
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		CC1:6000K; Ra:80;
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		Chip name:D4; Glue:01
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		CC1:2200K; Ra:80;
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		Chip name:D5; Glue:01
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		CC1:3500K; Ra:80;
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		Chip name:D4; Glue:01
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		CC1:2700K; Ra:80;
P2835W4D1-C02-8D1A01	P2835W4D1-C02-8D1A01		Chip name:D5; Glue:01

Glue:01		P2835W4D5-C02-8D1A01	Just in CCT and Chip name change	CC1:5000K; Chip name:D5
Glue:01		P2835W5D5-C02-8D1A01		CCT:6000K; Chip name:D5
Glue:01				

Client's Address
 Client's Mail, Tel. and Fax.
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