

Date: Sep. 02, 2025 Report No.: RKEYS250813367 Page 1 of 22

## TEST REPORT

EN 62471

Photobiological safety of lamps and lamp systems

Report Number....: RKEYS250813367

Total number of pages..... 22 pages

Tested by (name + signature).....: Sunny Li

Approved by (name + signature)...: Jason Zhan

Guangdong KEYS Testing Technology Co., Ltd. Testing Laboratory Name.....:

Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan,

Address....: Guangdong, China

Mid Ocean Brands B.V. Applicant's name....:

Unit 711-716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Address.....

Kowloon, Hong Kong

117486 Manufacturer's name....:

N/A Address....:

**Test specification:** 

EN 62471: 2008 Standard....:

Test procedure....: Safety report

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

Test item description....: Wireless Speaker

Trade Mark.....: N/A

Test Model: MO2665 Model/Type reference....:

Additional model: / Input: DC5V, 1A

Ratings....: Battery: DC3.7V, 800mAh



Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 2 of 22

#### General disclaimer:

This report is only for applicant use. Any copying this report to/for any other person or entity, and use our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification

#### **List of Attachments:**

Attachment 1: 4 pages of photos.

## **Summary of testing:**

The tested samples fulfilled the requirements of specified standards.

## **Testing location:**

Guangdong KEYS Testing Technology Co., Ltd.

Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China

### **Summary of compliance with National Differences:**

List of countries addressed: European National Differences.

☑ The product fulfils the requirements of EN 62471:2008.

Remark:

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 3 of 22

Test item particulars:	See test report
Tested lamp	: 🖂 continuous wave lamps 🔲 pulsed lamps
Tested lamp system:	N/A
Lamp classification group:	☐ exempt ☐ risk 1 ☐ risk 2 ☐ risk 3
Lamp cap	
Bulb	: LED
Rated of the lamp:	
Furthermore marking on the lamp:	N/A
Seasoning of lamps according IEC standard:	
Used measurement instrument	EN 62471 Tester
Possible test case verdicts:	0.46
- 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:	2.5
Date of receipt of test item:	Aug. 13, 2025
Date (s) of performance of tests:	Aug. 13, 2025 to Aug. 18, 2025
7/7	2
General remarks:	V a G
"(See Enclosure #)" refers to additional information a	ppended to the report.
"(See appended table)" refers to a table appended to the	e report.
Throughout this report a 🗌 comma / 🗵 point i	s used as the decimal separator.
General product information:	(E)
1. The appliance/equipment is "Wireless Speaker" wit	th model "MO2665", class III appliance only for indoor use
only.	4.5
2. The ambient temperature is 25°C.	1.6

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 4 of 22

	EN 62471	9	(E)
Clause	Requirement + Test	Result - Remark	Verdict
4	EXPOSURE LIMITS	(Car	P
4.1	General	(5)	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		Р 🔮
(G	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds 10 <sup>4</sup> cd·m <sup>-2</sup>	118	P
4.3	Hazard exposure limits	9	P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		P
(E	The exposure limit for effective radiant exposure is 30 J·m <sup>-2</sup> within any 8-hour period	(Ets)	P
6	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral		P
	irradiance , $E_{\text{S}}$ , of the light source shall not exceed the levels defined by:		
	$E_{s} \cdot t = \sum_{200}^{400} \sum_{t} E_{\lambda}(\lambda, t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 30$ J·m <sup>-2</sup>		E P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:		P
	$t_{\text{max}} = \frac{30}{E_{\text{s}}}$ 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 J·m <sup>-2</sup> 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 <sub>UVA</sub> , shall not exceed 10 W·m <sup>-2</sup> .	(Ex)	P.S
(6)	The permissible time for exposure to ultraviolet	(Co	P

Guangdong KEYS Testing Technology Co., Ltd.

Address: Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China Tel: +86-0769-89798319 http://www.keys-lab.com E-mail: info@keys-lab.com



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 5 of 22

Г	49	(4)	
	EN 62471	A	(Ex
Clause	Requirement + Test	Result - Remark	Verdict
Col	radiation incident upon the unprotected eye for time less	(C)	
6	than 1000 s, shall be computed by:	45	
	$t_{\text{max}} \le \frac{10\ 000}{E_{\text{UVA}}} \qquad \text{s}$		Р
4.3.3	Retinal blue light hazard exposure limit		P
Œ,	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:	(E)	P
(de	$L_{\rm B} \cdot t = \sum_{300}^{700} \sum_{t} L_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 10^{6} \qquad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	fort $\leq 10^4$ s $t_{\text{max}} = \frac{10^6}{L_{\text{B}}}$	P
6	$L_{\rm B} = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta \lambda \le 100 \qquad \qquad W \cdot m^{-2} \cdot \text{sr}^{-1}$	fort $> 10^4$ s	P
4.3.4	Retinal blue light hazard exposure limit - small source	9	N/A
	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:	(E)	N/A
(4)	$E_{B} \cdot t = \sum_{300}^{700} \sum_{t} E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 100  J \cdot m^{-2}$	£45	N/A
9	$E_{\rm B} = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta \lambda \le 1 \qquad W \cdot m^{-2}$	CE'S	N/A
4.3.5	Retinal thermal hazard exposure limit		P
E.	To protect against retinal thermal injury, the integrated spectral radiance of the light source, $L_{\lambda}$ , 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:	(E)	P

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 6 of 22

	EN 62471	A	(Et
Clause	Requirement + Test	Result - Remark	Verdict
(E)	$L_{R} = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta \lambda \le \frac{50000}{\alpha \cdot t^{0,25}} \qquad W \cdot m^{-2} \cdot sr^{-1}$	$(10 \ \mu s \le t \le 10 \ s)$	P
4.3.6	Retinal thermal hazard exposure limit – weak visual stim	ulus	P
(Ex	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 <sub>IR</sub> , as viewed by the eye for exposure times greater than 10 s shall be limited to:	05	P
(Co	$L_{\rm IR} = \sum_{780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta \lambda \le \frac{6000}{\alpha} \qquad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	t > 10 s	Р
4.3.7	Infrared radiation hazard exposure limits for the eye	(E)	6 P
9	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, E <sub>IR</sub> , over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:	9	P
. /.	$E_{\text{IR}} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta \lambda \le 18000 \cdot t^{-0.75}$ W·m <sup>-2</sup>	t ≤ 1000 s	E P
	For times greater than 1000 s the limit becomes:	50	P
7	$E_{\rm IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta \lambda \le 100$ W·m <sup>-2</sup>	t > 1000 s	Pu
4.3.8	Thermal hazard exposure limit for the skin		P
(Ex)	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:	(E)	P
	$E_{H} \cdot t = \sum_{380}^{3000} \sum_{t} E_{\lambda}(\lambda, t) \cdot \Delta t \cdot \Delta \lambda \le 20000 \cdot t^{0.25}$ J · m <sup>-2</sup>	The state of the s	PS

5 65	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		P	
5.1	Measurement conditions	(A)	125	P

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 7 of 22

	EN 62471	A	(Ex
Clause	Requirement + Test	Result - Remark	Verdict
(E)	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		P
5.1.1	Lamp ageing (seasoning)	A	N/A
030	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.	A59	N/A
5.1.2	Test environment	(F)	P
Œ	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.	Relative humidity shall be	P
5.1.3	Extraneous radiation	(4	P
9	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.	6	P
5.1.4	Lamp operation	(LE)	N/A
	Operation of the test lamp shall be provided in accordance with:		N/A
25	- the appropriate IEC lamp standard, or	049	N/A
7	- the manufacturer's recommendation	2 00	N/A
5.1.5	Lamp system operation	(E)	N/A
	The power source for operation of the test lamp shall be provided in accordance with:		N/A
(6)	- the appropriate IEC standard, or	125	N/A
4	- the manufacturer's recommendation	5	N/A
5.2	Measurement procedure	(FE)	P. 6
5.2.1	Irradiance measurements	V	P
26	Minimum aperture diameter 7mm.	0 (0	P
(TE)	Maximum aperture diameter 50 mm.	(E	Р
V		0.69	

 $Guang dong\ KEYS\ Testing\ Technology\ Co., Ltd.$ 

Address: Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China Tel: +86-0769-89798319 http://www.keys-lab.com E-mail: info@keys-lab.com



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 8 of 22

	The same		019
	EN 62471		(Te.
Clause	Requirement + Test	Result - Remark	Verdict
( )	The measurement shall be made in that position of the beam giving the maximum reading.	(E)	Р
	The measurement instrument is adequate calibrated.	(1)	P
5.2.2	Radiance measurements		Р (С
5.2.2.1	Standard method		P
(C)	The measurements made with an optical system.	(E)	P
9	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	050	N/A
9	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	A.6	Р
	The determination of $\alpha$ , the angle subtended by a source, requires the determination of the 50% emission points of the source.		(g <sup>*</sup> P
5.2.4	Pulse width measurement for pulsed sources	Continuous wave lamps	N/A
5	The determination of $\Delta t$ , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.	1/	N/A
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations	0 (0	P
6	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.		P
5.3.2	Calculations		P
(Ets	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted	1160	P

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 9 of 22

	EN 62471	9	(E)
Clause	Requirement + Test	Result - Remark	Verdict
(E)	energy.	(Colored Colored Color	
5.3.3	Measurement uncertainty	A CES	P
	The quality of all measurement results must be quantified by an analysis of the uncertainty.		P (C

6	LAMP CLASSIFICATION	(E)	N/A
	For the purposes of this standard it was decided that the values shall be reported as follows:	see table 6.1	N/A
Ć.	<ul> <li>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</li> </ul>	At a distance which produces an illuminance of 500 lux	N/A
9	<ul> <li>for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm</li> </ul>	9	N/A
6.1	Continuous wave lamps	(it's	P
6.1.1	Exempt Group		N/A
64	In the exempt group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:	E. C	N/A
7	- an actinic ultraviolet hazard (Es) within 8-hours exposure (30000 s), nor	J. Cero	N/A
	a near-UV hazard (E <sub>UVA</sub> ) within 1000 s, (about 16 min), nor		N/A
(E)	- a retinal blue-light hazard (L <sub>B</sub> ) within 10000 s (about 2,8 h), nor	Cets.	N/A
9	- a retinal thermal hazard (L <sub>R</sub> ) within 10 s, nor	A (60)	N/A
	– an infrared radiation hazard for the eye ( $E_{IR}$ ) within 1000 s		N/A
6.1.2	Risk Group 1 (Low-Risk)	4.6	P
(10)	In this group are lamps, which exceeds the limits for the	(6)	P

Guangdong KEYS Testing Technology Co., Ltd.

Address: Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China Tel: +86-0769-89798319 http://www.keys-lab.com E-mail: info@keys-lab.com



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 10 of 22

	EN 62471		(E
Clause	Requirement + Test	Result - Remark	Verdict
(E)	exempt group but that does not pose:	(E)	
9	- an actinic ultraviolet hazard (Es) within 10000 s, nor		P
	- a near ultraviolet hazard (E <sub>UVA</sub> ) within 300 s, nor	V	Р (
0.60	a retinal blue-light hazard (L <sub>B</sub> ) within 100 s, nor		P
(E	- a retinal thermal hazard (L <sub>R</sub> ) within 10 s, nor	(E)	P
	– an infrared radiation hazard for the eye ( $E_{IR}$ ) within $100\ s$	E.	P
()	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L <sub>IR</sub> ), within 100 s are in Risk Group 1.		P
6.1.3	Risk Group 2 (Moderate-Risk)	(Fe)	N/A
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N/A
7	<ul> <li>an actinic ultraviolet hazard (E<sub>S</sub>) within 1000 s exposure, nor</li> </ul>	9	N/A
	a near ultraviolet hazard (E <sub>UVA</sub> ) within 100 s, nor	(10)	N/A
	- a retinal blue-light hazard (L <sub>B</sub> ) within 0,25 s (aversion response), nor	<u> </u>	N/A
25	<ul> <li>a retinal thermal hazard (L<sub>R</sub>) within 0,25 s (aversion response), nor</li> </ul>	50	N/A
7	– an infrared radiation hazard for the eye (E $_{IR})$ within $10\ s$	J. Cero	N/A
049	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L <sub>IR</sub> ), within 10 s are in Risk Group 2.		N/A
6.1.4	Risk Group 3 (High-Risk)	(TO)	N/A
¥	Lamps which exceed the limits for Risk Group 2 are in Group 3.		N/A
6.2	Pulsed lamps		N/A
(E'S	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.	Continuous wave lamps	N/A

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 11 of 22

	EN 62471		(E)
Clause	Requirement + Test	Result - Remark	Verdict
(E)	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.	(E)	N/A
	The risk group determination of the lamp being tested shall be made as follows:		N/A
0.6	<ul> <li>a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)</li> </ul>	0.60	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
(G	- 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	(Eex's	N/A



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 12 of 22

Table 4.1 Spectral weight	ghting function for assessing	g ultraviolet hazards for skir	n and eye
Wavelength¹ 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
<sub>6</sub> 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

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 13 of 22

Table 4.1	Spectral weighting function for assessing ultraviolet hazards for skin and eye							
3	305	0,060	390	0,000044				
(C) 3	308	0,026	395	0,000036				
3	310	0,015	400	0,000030				

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

<sup>\*</sup> Emission lines of a mercury discharge spectrum.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 14 of 22

Spectral weighting sources	ng functions for assessing retinal hazard	is from broadband optical			
Wavelength nm	Blue-light hazard function B (λ)	Burn hazard function R (λ)			
300	0,01	0,1			
305	0,01	0,1			
310	0,01	0,1			
315	0,01	0,1			
320	0,01	0,1			
325	0,01	0,1			
330	0,01	0,1			
335	0,01	0,1			
340	0,01	0,1			
345	0,01	0,1			
350	0,01	0,1			
355	0,01	0,1			
360	0,01	0,1			
365	0,01	0,1			
370	0,01	0,1			
375	0,01	0,1			
380	0,01	0,1			
385	0,013	0,13			
<b>390</b>	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			

Guangdong KEYS Testing Technology Co., Ltd.

Address: Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China Tel: +86-0769-89798319 http://www.keys-lab.com E-mail: info@keys-lab.com



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 15 of 22

		0.6			(4)	/
Table 4.2		functions for assessing	g retinal hazard	s from broadban	d optical	(F)
	sources	7	12'			
15	455	0,90	(F)	0.60	9,0	
(10)	460	0,80		(10)	8,0	
A	465	0,70		A	7,0	
	470	0,62			6,2	^
	475	0,55	0.60		5,5	(fe
	480	0,45	(6		4,5	A
(E	485	0,40	9	1000	4,0	
9	490	0,22		(4)	2,2	
	495	0,16			1,6	
	500-600	10[(450-λ)/50]			1,0	
	600-700	0,001	120		1,0	1
	700-1050		(F)	0.6	Ι 0 <sup>[(700-λ)/500]</sup>	
(-	1050-1150	6	V	(6)	0,2	
	1150-1200			0,2	$2 \cdot 10^{0,02(1150-\lambda)}$	
	1200-1400	120			0,02	



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 16 of 22

Table 5.4	Summary of the ELs for the	sed values)			
Hazard Name	Relevant equation	on Wavelength Expos range durat nm sec		Limiting aperture rad (deg)	EL in terms of constant irradiance W•m <sup>-2</sup>
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	$E_{UVA} = \sum E_{\lambda} \bullet \Delta \lambda$	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	$E_{IR} = \sum E_{\lambda} \bullet \Delta \lambda$	780 –3000	≤1000 >1000	1,4 (80)	18000/t <sup>0,75</sup> 100
Skin thermal	$E_{\rm H} = \sum E_{\lambda} \bullet \Delta \lambda$	380 – 3000	< 10	2π sr	20000/t <sup>0,75</sup>

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

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 17 of 22

Table 6.1 Emi	ssion limits f	or risk grou	ps of continu	ous wave lamps	(Base on IEC	62471:2006)			P	
				Emission Measurement						
Risk	Action spectrum	Symbol	Units	Exempt		Low risk		Mo	Mod risk	
	spectrum			Limit	Result	Limit	Result	Limit	Result	
Actinic UV	SUV(λ)	S Es	W•m⁻²	0,001	0.00E+00	0.003	6	0.03	A	
Near UV	(f	Euva	W•m⁻²	0,33	2.52E-04	33		100		
Blue light	Β(λ)	$L_{B}$	W•m <sup>-2</sup> •sr <sup>-1</sup>	100	9.22E+00	10000		4000000	0.60	
Blue light, small source	Β(λ)	E <sub>B</sub>	W•m⁻²	- Co	- (2	, s			<u></u>	
Retinal thermal	<b>R</b> (λ)	$L_R$	W•m <sup>-2</sup> •sr <sup>-1</sup>	28000/α	2.62E+02	28000/α		71000/α		
Retinal thermal, weak visual stimulus**	$R(\lambda)$	${ m L_{IR}}$	W•m <sup>-2</sup> •sr <sup>-1</sup>	6000/α	2.61E-02	6000/α	7	6000/α	(let's	
IR radiation, eye	Y	E <sub>IR</sub>	W•m⁻²	100	5.32E-03	570	125	3200		

Remark:

Angular subtense of apparent source, α=50.1mrad

Guangdong KEYS Testing Technology Co., Ltd.

Address: Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China Tel: +86-0769-89798319 http://www.keys-lab.com E-mail: info@keys-lab.com



Report No.: RKEYS250813367 Date: Sep. 02, 2025

Page 18 of 22

Ta	ble 6.1	le 6.1 Emission limits for risk groups of continuous wave lamps (Base on IEC 62471:2006)	
* Small source defined as one with 0 < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.			
**	Involve	es evaluation of non-GLS source	

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 19 of 22

# Photo documentation

	110
✓ front  □ rear	
□ right side	20 30 40 50 60 70 60 90 100 100 100 100 100 100 100 100 100
□ left side	
□ top	40 80 80 100 10 20 10 10 20 10 10 10 10 10 10 10 10 10 10 10 10 10
□ bottom	
□ internal	Sos de oto es de or os de 101 or os de 001 or os de otos de ot
9	
9	(FE)
☑ front	
□ rear	20 00 00 100 100 20 20 00 20 100 100 100
☐ right side	S S S S S S S S S S S S S S S S S S S
☐ left side	30 o 0 o 0 o 0 o 0 o o o o o o o o o o o
□ top	
□ bottom	S om of 02 of 04 of 08 of 00for os of 04 of 06 of 08 o
□ internal	\$ 05 05 05 05 05 08 08 09 01 01 02 05 04 03 09 07 08 06 00201 02 05 04 03 09 07 08 06 00 04 05 05 05 05 05 05 05 05 05 05 05 05 05
000	A.69

Guangdong KEYS Testing Technology Co., Ltd.

Address: Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China Tel: +86-0769-89798319 http://www.keys-lab.com E-mail: info@keys-lab.com



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 20 of 22

 $\sqrt{\phantom{a}}$ front rear ☐ right side □ left side  $\sqrt{\phantom{a}}$ bottom О™ 01 02 06 04 03 09 07 08 0e 00for os 06 04 03 09 07 08 0e 005 internal front  $\sqrt{}$ rear ☐ right side ☐ left side top bottom internal 31 հումավայիակավավավավա<u>վավավավականականականական</u>

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 21 of 22

front rear ☐ right side □ left side  $\sqrt{}$ bottom internal front rear ☐ right side ☐ left side top bottom □ internal

Guangdong KEYS Testing Technology Co., Ltd.



Report No.: RKEYS250813367 Date: Sep. 02, 2025 Page 22 of 22

\*\*\* End of Report \*\*\*

Guangdong KEYS Testing Technology Co., Ltd.

Address: Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China Tel: +86-0769-89798319 http://www.keys-lab.com E-mail: info@keys-lab.com

