



TEST REPORT IEC 62471 Photobiological safety of lamps and lamp systems	
Report Number.....:	LCSB111822014S
Date of issue.....:	January 5, 2023
Total number of pages.....:	20 pages
Name of Testing Laboratory preparing the Report.....:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
Applicant's name.....:	AOK Industrial Company Limited
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Test specification:	
Standard.....:	IEC 62471:2006
Test procedure.....:	Type Test
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC62471B
Test Report Form(s) Originator.....:	VDE Testing and Certification Institute
Master TRF.....:	Dated 2018-08-16
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Test item description.....:	LED STADIUM LIGHT	
Trade Mark.....:		
Manufacturer.....:	AOK Industrial Company Limited	
Address.....:	1/F of 1#Building, East Block of 3/F of Building 1, And 2/F of Building 4, ST George's Science and Technology Industrial Park, Northside of Xinyu Road, Xiangshan Community, Xianqiao Street Baoan District, 518000 Shenzhen, Guangdong, CHINA	
Model/Type reference.....:	See model list on page 4-5	
Ratings.....:	See model list on page 4-5	
<input checked="" type="checkbox"/> Testing Laboratory:		
Testing location/ address.....:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China	
Tested by.....:	Rebecca Qin (Engineer)	
Check by.....:	Torres He (Director)	
Approved by.....:	Jesse Liu (Manager)	
List of Attachments (including a total number of pages in each attachment): Attachment No. 1: Photo documentation		
Summary of testing:		
Tests performed (name of test and test clause): IEC 62471:2006	Testing location: Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China	





Test item particulars..... :			
Tested lamp.....	<input checked="" type="checkbox"/> continuous wave lamps <input type="checkbox"/> pulsed lamps		
Tested lamp system.....	/		
Lamp classification group.....	<input type="checkbox"/> exempt <input checked="" type="checkbox"/> risk 1 <input type="checkbox"/> risk 2 <input type="checkbox"/> risk 3		
Lamp cap.....	/		
Bulb.....	/		
Rated of the lamp.....	200-410V~, 50/60Hz, 1800W		
Furthermore marking on the lamp.....	/		
Seasoning of lamps according IEC standard.....	IEC 62471		
Used measurement instrument.....	/		
Temperature by measurement.....	25 °C		
Information for safety use.....	Should be re-assessed in the final product according to its standard(s)		
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..... : December 28, 2022			
Date (s) of performance of tests..... : December 28, 2022			
General remarks:			
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. The general information of applicant and manufacturer (such as the name and address), product name, model/type reference, trademark and other similar information contained in this report are all provided by the applicant, the laboratory is not responsible for verifying its authenticity. Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p>			
Modified Information			
Version	Report No.	Revision Data	Summary
V1.0	LCSB111822014S	/	Original Version
Manufacturer's Declaration per sub-clause 4.2.5 of IECCE 02:			
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable		
When differences exist; they shall be identified in the General product information section.			
Name and address of factory (ies)..... : Same as the manufacturer			



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**General product information:**

- All models have the same structure and appearance except power, LED bead and LED driver are difference .
- All models used two LED type 5050 or 3535 with CCT 2700-6500K .
- Unless otherwise specified, the model AOK-1800WiSF-HV-DV-S5-6570-30-U and AOK-1800WiSF-HV-DV-S35-6570-15-U was chosen as representative model to perform all test.

Model List:

Model	Rating	LED driver
AOK-400WiSF-NV-00-aa-bbcc-zz-y-e	100-277V~, 50/60Hz, 400W	EUD-480S280DV
		EUD-480S280SV
AOK-400WiSF-HV-00-aa-bbcc-zz-y-e	277-480V~, 50/60Hz, 400W	ESD-480S-280DV
		ESD-480S280DV
		ESD-480S280SV
AOK-600WiSF-NV-00-aa-bbcc-zz-y-e	100-277V~, 50/60Hz, 600W	EUM-680S560MG
		EUM-680S560LG
		EUM- 680S560BG
		EUM- 680S560DG
		EUM-680S560SG
AOK-600WiSF-HV-00-aa-bbcc-zz-y-e	277-480V~, 50/60Hz, 600W	ESM-680S560MG
		ESM-680S560LG
		ESM-680S560BG
		ESM- 680S560DG
		ESM-680S560SG
AOK-800WiSF-NV-00-aa-bbcc-zz-y-e	100-277V~, 50/60Hz, 800W	EUM-880S700MG
		EUM-880S700LG
		EUM- 880S700BG
		EUM- 880S700DG
		EUM-880S700SG
AOK-800WiSF-HV-00-aa-bbcc-zz-y-e	277-480V~, 50/60Hz, 800W	ESM-880S700MG
		ESM-880S700LG
		ESM-880S700BG
		ESM- 880S700DG
		ESM-880S700SG
AOK- 1200WiSF-NV-00-aa-bbcc-zz-y-e	100-277V~, 50/60Hz, 1200W	EUM-680S560MG (2pcs)
		EBM- 1K2S740DG
		EBM- 1K2S740MG
		EBM-1K2S740SG
AOK- 1200WiSF-HV-00-aa-bbcc-zz-y-e	100-277V~, 50/60Hz, 1200W	EUM-680S560MG (2pcs)
	277-480V~, 50/60Hz, 1200W	ESM- 1K2S740MG
		ESM-1K2S740LG



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		ESM- 1K2S740BG
		ESM- 1K2S740DG
		ESM-1K2S740SG
AOK- 1500WiSF-HV-dd-aa-bbcc-zz-y-e	200-480V~, 50/60Hz, 1500W	MT1800H200CQ780
		MT1800H200CQI 780
AOK- 1800WiSF-HV-dd-aa-bbcc-zz-y-e	200-410V~, 50/60Hz, 1800W	MT1800H200CQ780
		MT1800H200CQI 780
Remark: "dd"=00 or DV represent electrical function, 00=Normal, DV=DALI. "aa"=S5 or S35 represent LED type, S5=Seoul 5050, S35=Seoul 3535. "bb"=27~ 65 any integer" represent the CCT, e.g. 27=2700K, 57=5700K. "cc" Represent CRI, can be 70, 80 or 90. "zz"=15, 20, 30, 35 or PG60" represent view angle of LED lens, 15=15°, 20=2030, 30=30°, 35=3585, PG60=125*60°. "y"= A, C or U represent different mounting brackets, A=type A top fixed, C=type C top fixed, U=Yoke Mount. "e"= A or Blank represent product type, A=split type, Blank=All-in-one		



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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		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



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Clause	Requirement - Test	Result - Remark	Verdict
	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
	$L_B \cdot t = \sum_{300}^{700} \sum_t L_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \cdot \Delta t \leq 10^6 \quad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	for $t \leq 10^4 \text{ s}$ $t_{\max} = \frac{10^6}{L_B}$	N/A
	$L_B = \sum_{300}^{700} L_\lambda \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	for $t > 10^4 \text{ s}$	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
	$E_B \cdot t = \sum_{300}^{700} \sum_t E_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \cdot \Delta t \leq 100 \quad \text{J} \cdot \text{m}^{-2}$	for $t \leq 100 \text{ s}$	N/A
	$E_B = \sum_{300}^{700} E_\lambda \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \quad \text{W} \cdot \text{m}^{-2}$	for $t > 100 \text{ s}$	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
	$L_R = \sum_{380}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50\,000}{\alpha \cdot t^{0.25}} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	($10 \mu\text{s} \leq t \leq 10 \text{ s}$)	P
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		N/A
	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:		N/A
	$L_{IR} = \sum_{780}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6\,000}{\alpha} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	$t > 10 \text{ s}$	N/A
4.3.7	Infrared radiation hazard exposure limits for the eye		P



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Clause	Requirement - Test	Result - Remark	Verdict
	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
	$E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 18\,000 \cdot t^{-0.75} \quad W \cdot m^{-2}$	$t \leq 1000 \text{ s}$	N/A
	For times greater than 1000 s the limit becomes:		P
	$E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2}$	$t > 1000 \text{ s}$	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
	$E_H \cdot t = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda, t) \cdot \Delta\lambda \leq 20\,000 \cdot t^{0.25} \quad J \cdot m^{-2}$	$t \leq 10 \text{ s}$	P
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.		P
5.1.1	Lamp ageing (seasoning)		P
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		P
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.		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		P
	Operation of the test lamp shall be provided in accordance with:		P
	— the appropriate IEC lamp standard, or		P



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	— 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		P
	— 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



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	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
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		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		N/A
	In the exempt group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		N/A
	– an actinic ultraviolet hazard (E_S) within 8-hours exposure (30000 s), nor		N/A
	– a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor		N/A
	– a retinal blue-light hazard (L_B) within 10000 s (about 2,8 h), 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 1000 s		N/A
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





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	— an actinic ultraviolet hazard (E_s) within 10000 s, nor		P
	— a near ultraviolet hazard (E_{UVA}) within 300 s, nor		P
	— a retinal blue-light hazard (L_B) within 100 s, nor		P
	— a retinal thermal hazard (L_R) within 10 s, nor		P
	— an infrared radiation hazard for the eye (E_{IR}) within 100 s		P
	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.		P
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-		N/A



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Clause	Requirement - Test	Result - Remark	Verdict
	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		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





IEC 62471			
Clause	Requirement - Test	Result - Remark	Verdict

Table 4.1 Spectral weighting function for assessing ultraviolet hazards for skin and eye			P
Wavelength 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



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Table 4.1	Spectral weighting function for assessing ultraviolet hazards for skin and eye		P
¹ 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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Table 4.2		Spectral weighting functions for assessing retinal hazards from broadband optical sources		P
Wavelength 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	



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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
	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

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	$6000/\alpha$	





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Table 6.1		Emission limits for risk groups of continuous wave lamps for model AOK-1800WiSF-HV-DV-S5-6570-30-U with 5050 type LED CCT 6500K , distance=5350mm, $\alpha=0,0075\text{rad}$							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	$\text{W}\cdot\text{m}^{-2}$	0,001	--	0,003	5,0e-05	0,03	--
Near UV		E_{UVA}	$\text{W}\cdot\text{m}^{-2}$	10	--	33	4,1e-05	100	--
Blue light	$B(\lambda)$	L_B	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	100	--	10000	6,73e+03	4000000	--
Blue light, small source	$B(\lambda)$	E_B	$\text{W}\cdot\text{m}^{-2}$	1,0*	--	1,0	2,03e-01	400	--
Retinal thermal	$R(\lambda)$	L_R	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	28000/ α	--	28000/ α	1,0e+05	71000/ α	--
Retinal thermal, weak visual stimulus**	$R(\lambda)$	L_{IR}	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	6000/ α	--	6000/ α	--	6000/ α	--
IR radiation, eye		E_{IR}	$\text{W}\cdot\text{m}^{-2}$	100	--	570	1,1e-01	3200	--
* 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									

Table 6.1		Emission limits for risk groups of continuous wave lamps for model AOK-1800WiSF-HV-DV-S35-6570-15-U with 3535 type LED CCT 6500K , distance=5600mm, $\alpha=0,0561\text{rad}$							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	$\text{W}\cdot\text{m}^{-2}$	0,001	--	0,003	1,1e-03	0,03	--
Near UV		E_{UVA}	$\text{W}\cdot\text{m}^{-2}$	10	--	33	7,6e-04	100	--
Blue light	$B(\lambda)$	L_B	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	100	--	10000	2,04e+02	4000000	--





IEC 62471			
Clause	Requirement - Test	Result - Remark	Verdict

Table 6.1		Emission limits for risk groups of continuous wave lamps for model AOK-1800WiSF-HV-DV-S35-6570-15-U with 3535 type LED CCT 6500K , distance=5600mm, $\alpha=0,0561\text{rad}$							P
Blue light, small source	B(λ)	E_B	$W \cdot m^{-2}$	1,0*	--	1,0	3,86e-01	400	--
Retinal thermal	R(λ)	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	--	$28000/\alpha$	2,5e+03	$71000/\alpha$	--
Retinal thermal, weak visual stimulus**	R(λ)	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	$6000/\alpha$	--	$6000/\alpha$	--	$6000/\alpha$	--
IR radiation, eye		E_{IR}	$W \cdot m^{-2}$	100	--	570	3,6e-05	3200	--
* 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 No.1

Photo Documentation

View:

- ☒ General
☐ Front
☐ Rear
☐ Internal
☐ Top
☐ Bottom
☐ PWB



Figure 1 Model:AOK-1800WiSF-HV-DV-S5-6570-30-U, AOK-1800WiSF-HV-DV-S35-6570-15-U

View:

- ☒ General
☐ Front
☐ Rear
☐ Internal
☐ Top
☐ Bottom
☐ PWB



Figure 2



Attachment No.1

Photo Documentation

View:

- ☒ General
☐ Front
☐ Rear
☐ Internal
☐ Top
☐ Bottom
☐ PWB



Figure 3 LED (5050) module view of model AOK-1800WiSF-HV-DV-S5-6570-30-U

View:

- ☒ General
☐ Front
☐ Rear
☐ Internal
☐ Top
☐ Bottom
☐ PWB



Figure 4 LED (3535) module view of model AOK-1800WiSF-HV-DV-S35-6570-15-U

-----End of Test Report-----

