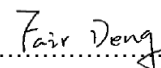
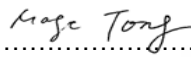




TEST REPORT IEC TR 62778 Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires	
Report Number.....	4901326.50
Date of issue	2023-05-12
Total number of pages	16 pages
Name of Testing Laboratory preparing the Report	DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch
Applicant's name	AOK Industrial Company Limited
Address.....	East Suite (2/F, Plant 4, St George's Science and Technology Industrial Park) 3/F, Building 1, St George's Science and Technology Industrial Park North Side of Xinyu Road, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Test specification:	
Standard	IEC TR 62778:2014 (Second Edition)
Test procedure	Type test
Non-standard test method	N/A
Test Report Form No.	IEC62778A
Test Report Form(s) Originator	TÜV SÜD Product Service GmbH
Master TRF	Dated 2016-02
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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.	
General disclaimer:	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	

Test item description..... :	LED Steetlight	
Trade Mark..... :		
Manufacturer	Same as applicant	
Model/Type reference	Refer to Attachment 4 for detailed model list	
Ratings	220-240 VAC, 50/60 Hz, Class I, IP66, ta: 55 °C; non-user replaceable LEDs; Other information refers to Attachment 4 for detailed model list	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒	Testing Laboratory:	DEKRA Testing and Certification (Shanghai) Ltd., Guangzhou Branch
Testing location/ address.....:		Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China
Tested by (name, function, signature)		Fair Deng (Project Handler) 
Approved by (name, function, signature) ...:		Magic Tong (Reviewer) 

List of Attachments (including a total number of pages in each attachment): Attachment 1: List of test equipment used (1 page) Attachment 2: Photos (4 pages) Attachment 3: LED chip specification (1 page) Attachment 4: Detailed model list (1 page)	
Summary of testing:	
Tests performed (name of test and test clause): AOK-300WiL02-NV-S3-PH-6570-T2-P (with Seoul 3535, 6500 K LEDs, without/with lens) and AOK-100WiLA-NV-S5-PH-6570-T2-P (with Seoul 5050, 6500 K LEDs, without lens) were subjected to full test. All models were subjected to construction check.	Testing location: DEKRA Testing and Certification (Shanghai) Ltd., Guangzhou Branch Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China
Summary of compliance with National Differences (List of countries addressed): ☒ N/A	
Copy of marking plate: N/A	

Test item particulars : LED Steetlight	
Product evaluated..... : ☐ LED package ☐ LED module ☐ Lamp ☒ Luminaire	
Rated voltage (V) : 220-240 V, 50/60 Hz	
Rated current (mA) : --	
Rated CCT (K)..... : --	
Rated Luminance (Mcd/m²) : ---	
Component report data used : ☒ Not applicable ☐ LED package ☐ LED module ☐ Lamp Report number: ---	
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 : 2023-05-08 Date (s) of performance of tests : 2023-05-08 to 2023-05-10	
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a ☒ comma / ☐ point is used as the decimal separator. Clause numbers between brackets refer to clauses in IEC 60598-1 The measurement result is considered in conformance with the requirement if it is within the prescribed limit, it is not necessary to calculate the uncertainty associated with the measurement result. This report will not be used for social proof function in China market.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60598-1:	
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:	☐ Yes ☒ Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) : Same as applicant	

General product information:

The products in this report were tested and compliant with following standard:

-IEC TR 62778: 2014

The products covered in this report are class I streetlights, equipped with non-user replaceable LEDs.

For the blue light hazard required by IEC TR 62778: 2014, AOK-300WiL02-NV-S3-PH-6570-T2-P (with Seoul 3535, 6500 K LEDs) and AOK-100WiLA-NV-S5-PH-6570-T2-P (with Seoul 5050, 6500 K LEDs) had been tested and the detailed test results refer to below table:

Model	Power	LED type	With lens	Without Lens	D _{thr}
AOK-300WiL02-NV-S3-PH-6570-T2-P	300 W	Seoul 3535	RG2	RG2	5218 mm
AOK-100WiLA-NV-S5-PH-6570-T2-P	100 W	Seoul 5050	---	RG1	---

According to these test results, the products with Seoul 3535 LEDs in this report were classified as Risk Group 2 and need mark dthr: 5218 mm, the products with Seoul 5050 LEDs in this report were classified as Risk Group 1 and needn't mark dthr.

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
	MEASUREMENT INFORMATION FLOW		
7.1	Basic flow		P
	'Law of conservation of luminance' applied		N/A
	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		
	Risk group achieved:		P
	- ..Risk Group 0 unlimited		N/A
	- ..Risk Group 1 unlimited	Products with Seoul 5050 LEDs	P
	- E_{thr} (lx) : Distance to reach RG1 (m) :	Products with Seoul 3535 LEDs, d_{thr} : 5218 mm	P

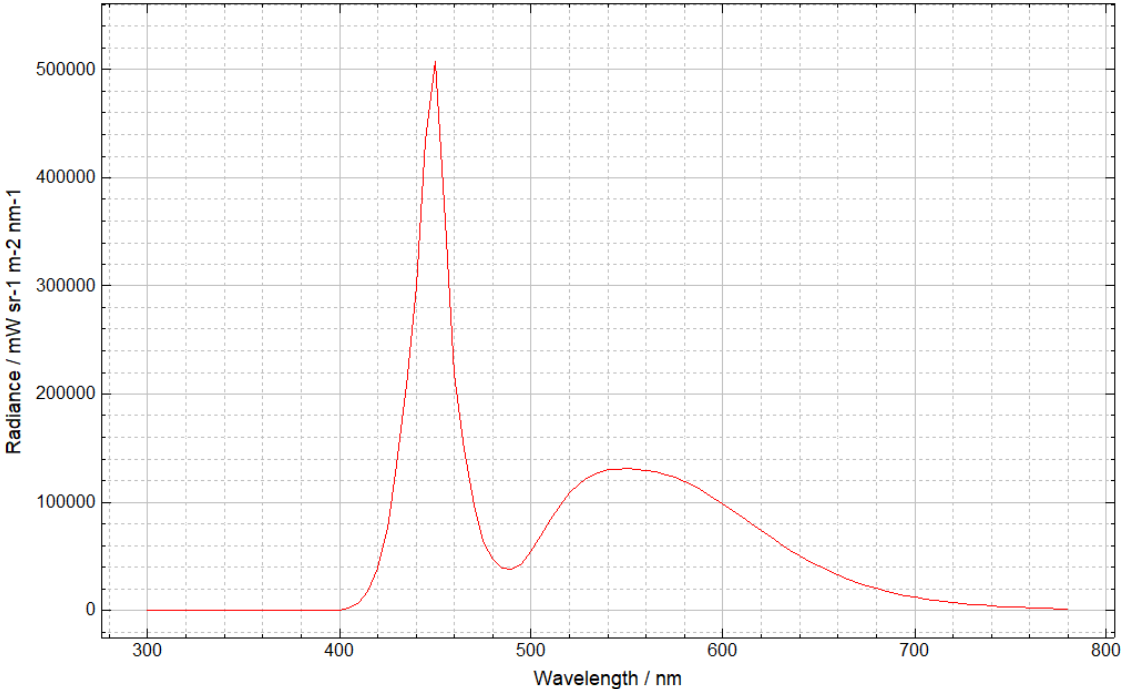
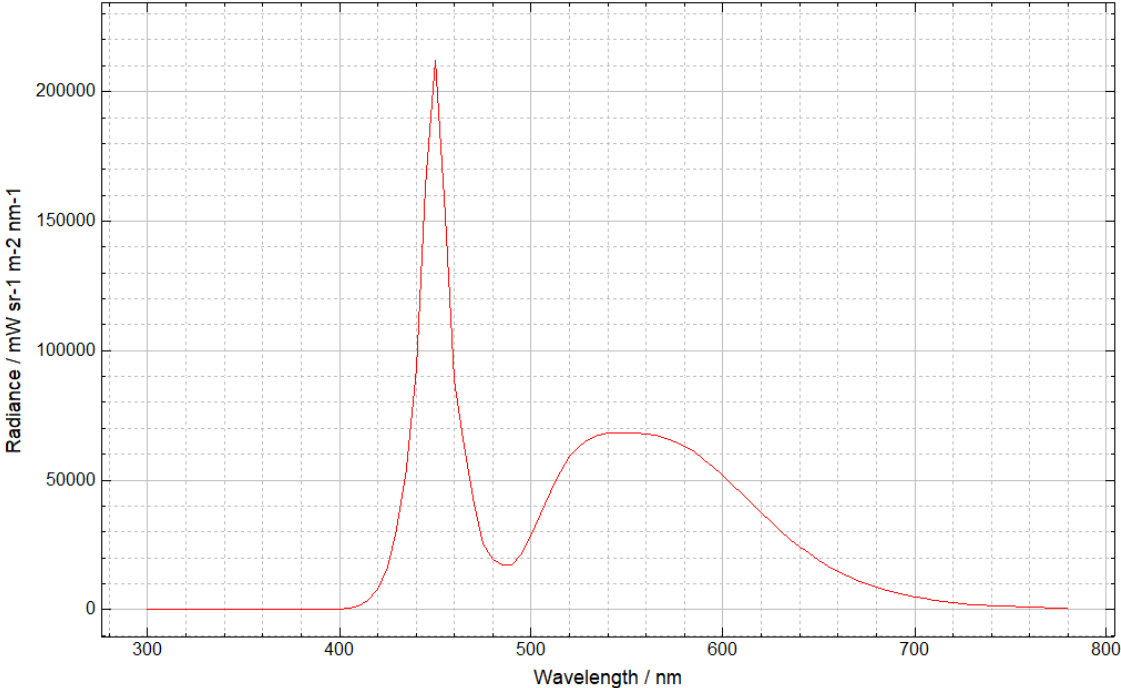
IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectroradiometric measurement				P
	Measurement performed on:	☐ LED package ☐ LED module ☐ Lamp ☒ Luminaire			
	Model number	AOK-300WiL02-NV-S3-PH-6570-T2-P (with Seoul 3535, 6500 K LEDs, with lens)			
	Test voltage (V)	240			—
	Test current (mA)	1246			—
	Test frequency (Hz)	50			—
	Ambient, t (°C)	25			—
	Measurement distance	☒ 20 cm ☐ ... cm			—
	Source size	☒ Non-small ☐ Small : mm			—
	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)	12118	--
Blue light hazard irradiance		E _B	W/m ²	--	--
Luminance		L	cd/m ²	8041667,6	--
Illuminance		E	lx	159465	--
Supplementary information: --					

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectroradiometric measurement				P
	Measurement performed on:	☐ LED package ☐ LED module ☐ Lamp ☒ Luminaire			
	Model number	AOK-100WiLA-NV-S5-PH-6570-T2-P (with Seoul 5050, 6500 K LEDs, without lens)			
	Test voltage (V)	240			—
	Test current (mA)	410			—
	Test frequency (Hz)	50			—
	Ambient, t (°C)	25			—
	Measurement distance	☒ 20 cm ☐ ... cm			—
	Source size	☒ Non-small ☐ Small : mm			—
	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)	4500,7	--
Blue light hazard irradiance		E _B	W/m ²	--	--
Luminance		L	cd/m ²	4125353,3	--
Illuminance		E	lx	63903	--
Supplementary information: --					

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE: Angular light distribution			P
AOK-300WiL02-NV-S3-PH-6570-T2-P (with Seoul 3535, 6500 K LEDs, with lens):			
			
AOK-100WiLA-NV-S5-PH-6570-T2-P (with Seoul 5050, 6500 K LEDs, without lens):			
			

Attachment 1: List of test equipment used

Clause	Measurement/ testing	Registration Number	Testing/measuring equipment/material used	Range used
5	Irradiance measurements Radiance measurements	G/L655	Spectroradiometer	200-3000nm

Attachment 2: Photos



Overall view of AOK-300WiL02-NV-S3-PH-6570-T2-P



Rear view of AOK-300WiL02-NV-S3-PH-6570-T2-P



Internal view of AOK-300WiL02-NV-S3-PH-6570-T2-P



Internal view of AOK-300WiL02-NV-S3-PH-6570-T2-P



Overall view of AOK-100WiLA-NV-S5-PH-6570-T2-P



Rear view of AOK-100WiLA-NV-S5-PH-6570-T2-P



Internal view of AOK-100WiLA-NV-S5-PH-6570-T2-P



Internal view of AOK-100WiLA-NV-S5-PH-6570-T2-P

Attachment 3: LED chip specification

Manufacturer	LED type number	Technical Data	Remark
Seoul	Seoul 3535	V_F : 2,75-2,95 V, I_F : 700 mA, 2700-6500 K	Refer to Attachment 4
Seoul	Seoul 5050	V_F : 5,8-6,4 V, I_F : 640 mA, 2700-6500 K	Refer to Attachment 4

Attachment 4: Detailed Model List

No.	Model	Power (W)	LED Type	Dimension (mm)	Remark
1-1	AOK-20WiLA-NV-XX-XX-XXYY-BN-P	20	Seoul 5050	537*210*88	Length*Width*Height
1-2	AOK-30WiLA-NV-XX-XX-XXYY-BN-P	30		537*210*88	Length*Width*Height
1-3	AOK-40WiLA-NV-XX-XX-XXYY-BN-P	40		537*210*88	Length*Width*Height
1-4	AOK-50WiLA-NV-XX-XX-XXYY-BN-P	50		537*210*88	Length*Width*Height
1-5	AOK-60WiLA-NV-XX-XX-XXYY-BN-P	60		537*210*88	Length*Width*Height
1-6	AOK-70WiLA-NV-XX-XX-XXYY-BN-P	70		537*210*88	Length*Width*Height
1-7	AOK-75WiLA-NV-XX-XX-XXYY-BN-P	75		537*210*88	Length*Width*Height
1-8	AOK-80WiLA-NV-XX-XX-XXYY-BN-P	80		567*228*88	Length*Width*Height
1-9	AOK-90WiLA-NV-XX-XX-XXYY-BN-P	90		567*228*88	Length*Width*Height
1-10	AOK-100WiLA-NV-XX-XX-XXYY-BN-P	100		567*228*88	Length*Width*Height
2-1	AOK-20WiL02-NV-XX-XX-XXYY-BN-P	20	Seoul 3535	492*179*119	Length*Width*Height
2-2	AOK-30WiL02-NV-XX-XX-XXYY-BN-P	30		492*179*119	Length*Width*Height
2-3	AOK-40WiL02-NV-XX-XX-XXYY-BN-P	40		492*179*119	Length*Width*Height
2-4	AOK-50WiL02-NV-XX-XX-XXYY-BN-P	50		492*179*119	Length*Width*Height
2-5	AOK-60WiL02-NV-XX-XX-XXYY-BN-P	60		492*179*119	Length*Width*Height
2-6	AOK-80WiL02-NV-XX-XX-XXYY-BN-P	80		646*240*137	Length*Width*Height
2-7	AOK-90WiL02-NV-XX-XX-XXYY-BN-P	90		646*240*137	Length*Width*Height
2-8	AOK-100WiL02-NV-XX-XX-XXYY-BN-P	100		646*240*137	Length*Width*Height
2-9	AOK-120WiL02-NV-XX-XX-XXYY-BN-P	120		646*240*137	Length*Width*Height
2-10	AOK-130WiL02-NV-XX-XX-XXYY-BN-P	130		676*290*137	Length*Width*Height
2-11	AOK-140WiL02-NV-XX-XX-XXYY-BN-P	140		676*290*137	Length*Width*Height
2-12	AOK-150WiL02-NV-XX-XX-XXYY-BN-P	150		676*290*137	Length*Width*Height
2-13	AOK-160WiL02-NV-XX-XX-XXYY-BN-P	160		676*290*137	Length*Width*Height
2-14	AOK-180WiL02-NV-XX-XX-XXYY-BN-P	180		676*290*137	Length*Width*Height
2-15	AOK-200WiL02-NV-XX-XX-XXYY-BN-P	200		756*308*138	Length*Width*Height
2-16	AOK-220WiL02-NV-XX-XX-XXYY-BN-P	220		756*308*138	Length*Width*Height
2-17	AOK-225WiL02-NV-XX-XX-XXYY-BN-P	225		756*308*138	Length*Width*Height
2-18	AOK-230WiL02-NV-XX-XX-XXYY-BN-P	230		756*308*138	Length*Width*Height
2-19	AOK-240WiL02-NV-XX-XX-XXYY-BN-P	240		756*308*138	Length*Width*Height
2-20	AOK-250WiL02-NV-XX-XX-XXYY-BN-P	250		756*308*138	Length*Width*Height
2-21	AOK-275WiL02-NV-XX-XX-XXYY-BN-P	275		756*308*138	Length*Width*Height
2-22	AOK-300WiL02-NV-XX-XX-XXYY-BN-P	300		756*308*138	Length*Width*Height

Description:

The first "XX" can be any letters to denote manufacturer of LED; and can be replaced by S5 to represent Seoul 5050 LED, or S35 to represent Seoul 3535 LED;

The second "XX" denotes dimming control; which can be as followings: 00=No sensor provided, PH=Plug-In photocontrol or NEMA Short-circuit cap provided, DV=dimming function;

The third "XX" can be 27, 30, 40, 50, 57 or 65 to denote colour temperature of LEDs, e.g. 27=2700K, 30=3000K, 40=4000K, 50=5000K, 57=5700K, 65=6500K;

"YY" can be 70, 80 or 90 to denote colour rendering index of LEDs, e.g. 70: CRI: 70, 80: CRI: 80, 90: CRI: 90;

"BN" can be any letter or number to denote beam angles

---END---