

TEST REPORT

Prepared For

#AOK LED Light Company Limited

#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: AOK-800WiSF-HV-S5-00-5070-30-P

Report Type:	Report is prepared for the client above to present the result of measured temperature of samples and projected lumen maintenance life of LED lighting product according to projecting method from IES: IES TM-21-19
Reviewed By:	Hexy He <i>Hexy He</i>
Report Number:	DG3220519-21532E-10
Test Date:	2022-05-21
Report Date:	2022-06-08
Approved by:	Bill Xiong / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 5/F(B-West) -7/F, the 3rd Phase of Wan Li Industrial Building D, Shihua Road, Futian Free Trade Zone Shenzhen, Guangdong, China. Tel: +86-755-33320018 Fax: +86-755-33320008
Test Facility:	Test facility was located at No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China.

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Shenzhen). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S. Government.

1. General Description[#]

Information of Final Products:

One test sample was in good condition and received on 2022-05-19, and used for testing.

Model Number:	AOK-800WiSF-HV-S5-00-5070-30-P
Model Name:	Stadium Light
Brand Name:	AOK
Manufacturer:	AOK LED Light Company Limited
Rated Voltage:	180-528V, 60Hz
Test Voltage:	220V, 60Hz
Rated Power:	800W
Series-Parallel:	28S 6P
Number of LED chips:	168
Average drive current:	387mA
Total drive current:	2322mA
Driver Brand:	Shenzhen Sosen Electronics Co.,Ltd
Driver Model:	SS-800M-190BH

Information of LED Light Source:

Model Number of LED Light Source:	STW0L8PA(5000K)
Type of LED Components:	LED Package
Manufacturer:	Seoul Semiconductor Co. Ltd
LM-80 Report No:	RSZ190718514-10

2. Standards Used

- *IES TM-21-19 Projecting Long Term Lumen Maintenance of LED Light Sources(This method is not in NVLAP accreditation scope)
- ANSI/UL 1598-2008: Standard for Safety of Luminaires
- Annex A of IES LM-84-14 Recommendations for measurement of IN-SITU conditions LED case temperature

3. Test Method

Lumen maintenance life of LED light source and LED lamp or luminaire (if any) is the elapsed operating time over which an LED light source maintains a given percentage of its initial light output. L_{70} in this report is the time (in hours) when the light output from the LED has dropped to 70% of its initial output.

The LED light source is LED package, array, or module which is tested in IES LM-80-15 test report. Final product means LED lamp or luminaire which the LED light source will be included. TMP_{LED} is the temperature of the thermocouple attachment point on the LED light source package as defined by the manufacturer of the LED light source. The *in situ* temperature of LED light source used in final product was used to calculate the lumen maintenance life of final product, if any.

The *in situ* temperature is measured according to ANSI/UL 1598 and IES LM-84 Annex A. The LED which has the highest temperature was measured at the location of LED case which is specified by LED source manufacturer and detailed by LM-80 report. The hottest LED was found by the following procedure:

An IR thermography may be used to find the hottest LEDs. Or if the layout of PCB is symmetrical, the hottest LED should be at the center or close to the center of the array. Or in question, more than one TMP should be measured to find out the hottest LED. The case temperature of the hottest LED source at *in situ* condition is reported and is used to

project L₇₀ life time.

The reported temperature value for each point should be the readings of the hybrid recorder after the temperature of each point is stabilized and constant. A temperature is considered constant if the test has been running for at least 3 hours; and three successive readings, taken at 15-minute intervals, are within 1 degree C of one another and are not rising. Or the test was run for a minimum of 7.5 h. Ambient temperature variations above or below 25 °C have been respectively subtracted from or added to temperatures recorded at points on the device.

The drive current of LED package/module/ array was calculated as the total output current of the driver measured by multimeter, divided by the number of branches in parallel of LEDs.

The calculation of the L₇₀ life is according to IES TM-21-19.

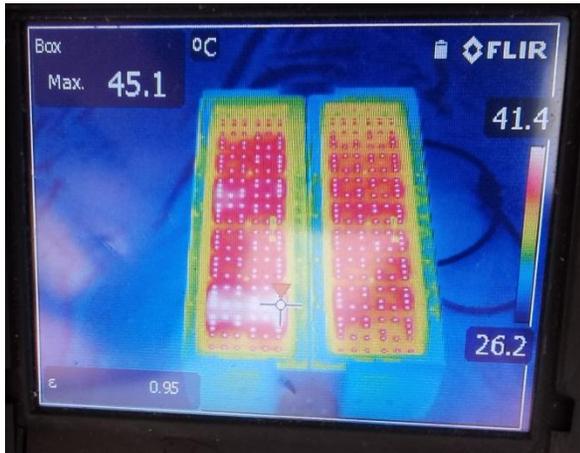
4. Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Multimeter	FLUKE	17B	1573 1328	2021-09-23	2022-09-22
Hybrid Recorder	YOKOGAWA	DR240	10#	2022-01-05	2023-01-04
AC POWER SUPPLY	HengPu	HPA 1103	0003394	2022-01-05	2023-01-04
Thermography	FLIR	E60	49037877	N/A	N/A

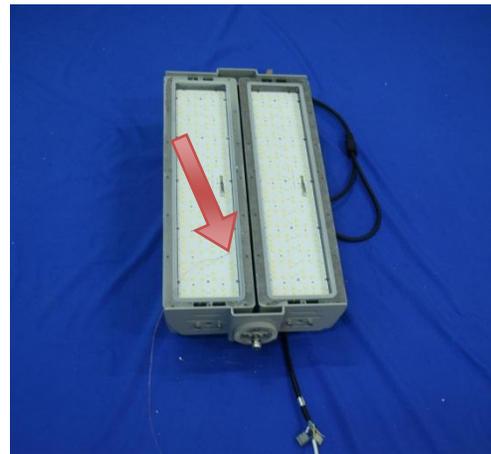
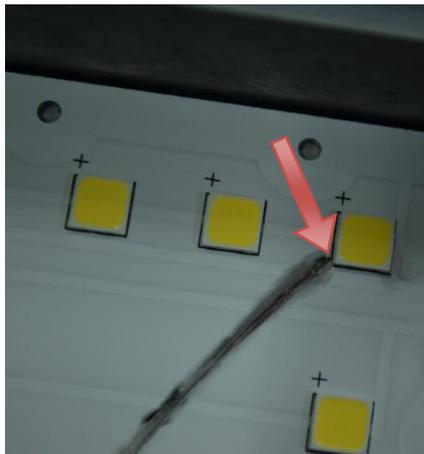
Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

5. In situ Temperature and Driver Current Measurements of Final Product

IR thermograph from hot PCBAs of Sample



Temperature measurement point on TMP_{LED}



Temperature Measurement Data

Test Condition

Ambient Temperature: 25°C±5°C

Relative Humidity: 42%

Supply voltage: 220V 60Hz

Type of thermocouples: T

Test Duration: ≥3.5Hours

Test Result

Hottest TMP_{LED}: 84.8°C

Forward Current(I_F): 387mA

6. Lumen Maintenance Data of LED Light Source from LM-80 Report

Test Data for 55°C Case Temperature		Test Data for 85°C Case Temperature		Test Data for 105°C Case Temperature	
Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)
1000	99.97	1000	99.94	1000	99.91
2000	99.87	2000	99.81	2000	99.74
3000	99.72	3000	99.59	3000	99.47
4000	99.56	4000	99.39	4000	99.24
5000	99.39	5000	99.21	5000	99.02
6000	99.21	6000	99.02	6000	98.76
7000	99.05	7000	98.83	7000	98.52
8000	98.90	8000	98.64	8000	98.30
9000	98.77	9000	98.45	9000	98.08

7. Calculate Result of Life Time Projection

Temperature Interpolation at 84.8° C (projection based on in-situ temperature entered)	
$T_{s,1}$ (°C)	55.00
$T_{s,1}$ (K)	328.15
α_1	1.608E-06
B_1	1.002
$T_{s,2}$ (°C)	85.00
$T_{s,2}$ (K)	358.15
α_2	1.906E-06
B_2	1.002
E_a/k_b	6.67E+02
A	1.228E-05
B_0	1.002
$T_{s,i}$ (°C)	84.80
$T_{s,i}$ (K)	357.95
α_i	1.904E-06
Reported L₇₀(9k) at 84.8°C (hours)	>54000

8. Final Product Photo



Directions

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*****END OF REPORT*****