

LM-79-08 Test Report

For

AOK LED Light Company Limited(Brand Name: 
Quality, Honesty, Service and InnovationBuilding 1, St George's Science and Technology Industrial Park, Shajin Street,
Shenzhen, Guangdong Province, China Zip 518104**Outdoor Pole/Arm-Mounted Area and Roadway
Luminaires**

Model name(s): AOK-300WIS-(D)-X

Representative (Tested) Model: AOK-300WIS-(D)-X(3000K)
AOK-300WIS-(D)-X(5700K)

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Jun.15,2017

Review By:

Tommy Liang

Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Laboratory: Standard-Tech Co. Ltd Testing Center
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2


Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320

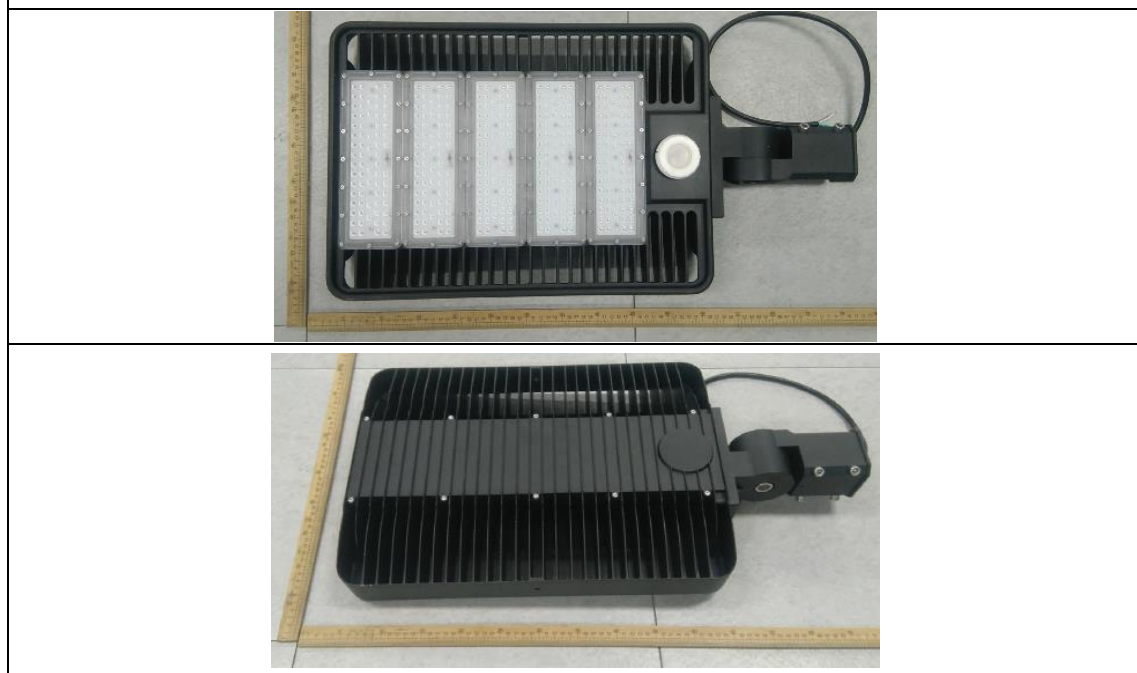
Fax: 8620-32290422

<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	AOK LED Light Company Limited	
Brand Name		
Model Number	AOK-300WIS-(D)-X	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	
Rated Voltage / Frequency	90 -305Vac, 47-63 Hz	
Nominal Power	300W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K,4500K,5000K,5700K	
LED Manufacturer	Philips Lumileds	
LED Model	LUXEON 3030 2D	
Sample Number	GZE170259-P1(3000K),P2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	Jun.09,2017
Date of Test	Jun.10,2017
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.3 Test Methods

<p>1) Photometric and Light Distribution Measurement – Goniophotometer Method: Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25 °C ± 1 °C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 ° vertical intervals and 22.5 ° horizontal intervals.</p>
<p>2) Chromaticity Measurement – Sphere-Spectroradiometer Method: Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.</p>
<p>3) Electrical Measurements: Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25 °C ± 1 °C. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.</p>

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-06-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AOK-300WIS-(D)-X(3000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170259-P1	120.0	60	2.612	313.1	0.9988	8.71
	277.0	60	1.138	299.3	0.9499	14.09
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

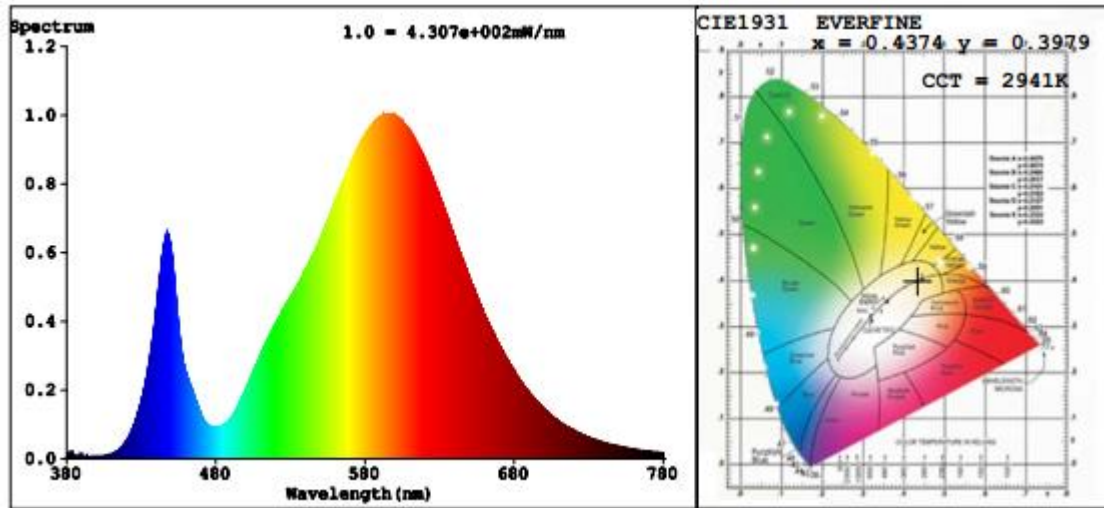
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	70	R9	0
Frequency (Hz)	60	R2	82	R10	59
CCT (K)	2941	R3	93	R11	63
Duv	-0.0025	R4	69	R12	52
Chromaticity (x, y)	x=0.4374 y=0.3979	R5	68	R13	72
Chromaticity (u', v')	u'=0.2536 v'=0.5190	R6	75	R14	96
Color Rendering Index (CRI)	72.8	R7	78	R15	63
R9	0	R8	47	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V4.1 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	40540	39386	>=1000(-10%)	
Luminous Efficacy (lm/W)	129.48	131.59	Standard: >= 100(-3%)	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	125.79			
Zonal lumens in the 0-90 °zone (%)	99.8	--	>=100(-1)	
Zonal lumens in the 80-90 °zone (%)	0.9	--	<=10(+3)	
Beam Angle (°)	88.7	--	--	
Center Beam Candle Power (cd)	8217	--	--	

Spectral Power Distribution & Chromaticity Diagram

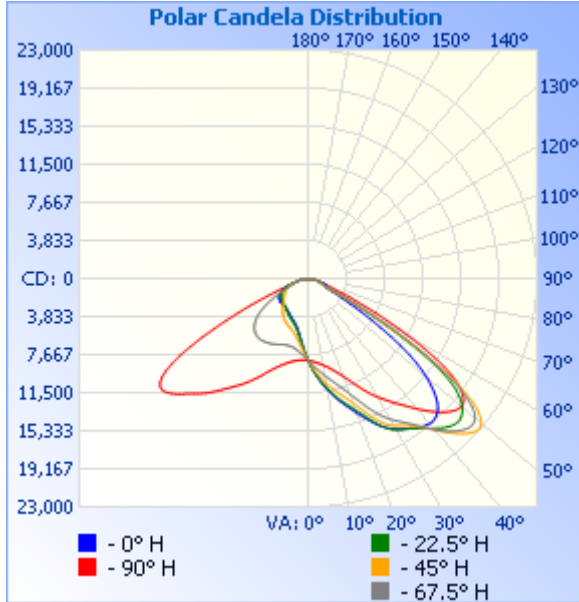


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	8,168.8	20.2%
0-40	15,623.3	38.5%
0-60	35,486.5	87.5%
60-90	4,961.3	12.2%
70-100	1,700.5	4.2%
90-120	24.0	0.1%
0-90	40,447.8	99.8%
90-180	89.1	0.2%
0-180	40,536.9	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	797.7	2.0%	90-100	3.1	0%
10-20	2,543.8	6.3%	100-110	6.9	0%
20-30	4,827.2	11.9%	110-120	14.0	0%
30-40	7,454.5	18.4%	120-130	18.7	0%
40-50	10,205.5	25.2%	130-140	17.8	0%
50-60	9,657.7	23.8%	140-150	12.9	0%
60-70	3,263.9	8.1%	150-160	8.6	0%
70-80	1,348.6	3.3%	160-170	5.0	0%
80-90	348.8	0.9%	170-180	2.1	0%

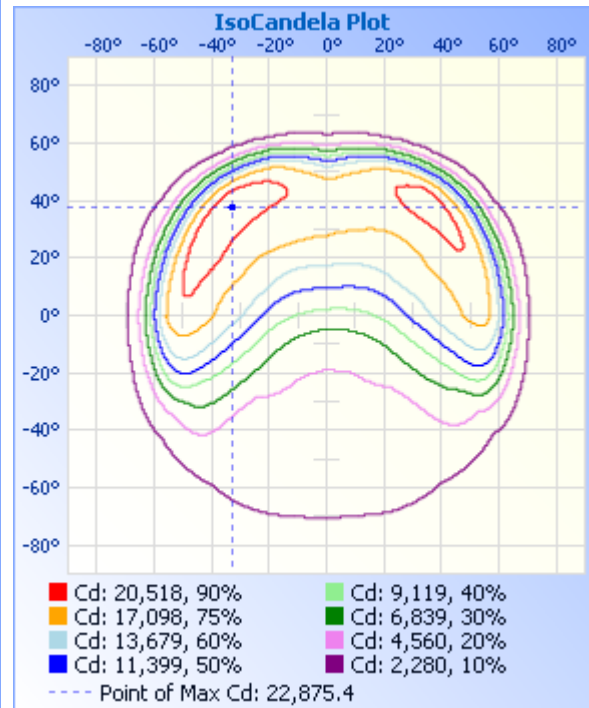
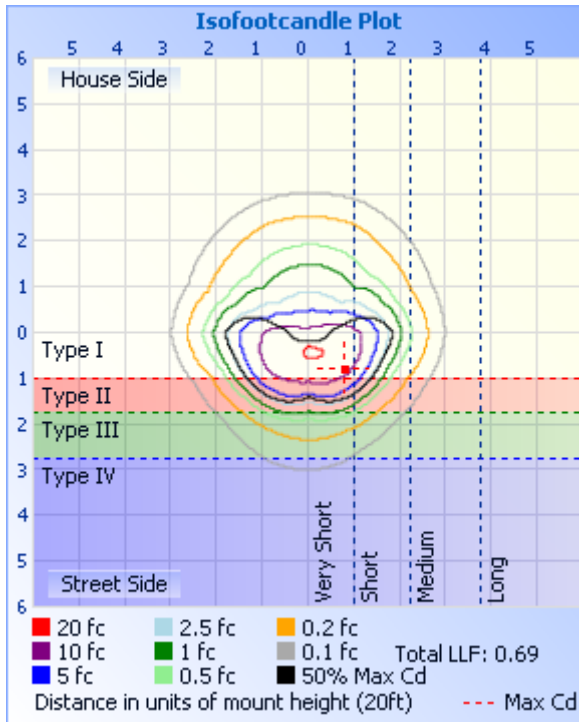
Photometric Data



Illuminance at a Distance

Distance (ft)	Center Beam fc	Beam Width	Beam Width (ft)
17.0ft	28.4 fc	19.6 ft	39.5 ft
34.0ft	7.11 fc	39.3 ft	79.0 ft
51.0ft	3.16 fc	58.9 ft	118.4 ft
68.0ft	1.78 fc	78.6 ft	157.9 ft
85.0ft	1.14 fc	98.2 ft	197.4 ft
102.0ft	0.79 fc	117.9 ft	236.9 ft

■ Vert. Spread: 60.0°
■ Horiz. Spread: 98.5°



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Table--1 UNIT: ×10cd

C (DEG) \ γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338	
0	822	822	822	822	822	822	822	822	822	822	822	822	822	822	822	822	
5	822	883	933	969	985	977	950	904	845	781	722	682	665	674	706	759	
10	844	955	1044	1110	1139	1125	1076	996	886	761	646	575	548	561	618	720	
15	885	1037	1154	1245	1286	1267	1196	1098	950	763	594	506	480	494	560	702	
20	954	1141	1271	1378	1442	1411	1340	1238	1052	790	562	466	444	458	527	708	
25	1063	1295	1429	1537	1614	1601	1543	1438	1203	836	536	437	416	429	502	729	
30	1199	1458	1572	1670	1747	1758	1708	1630	1369	886	509	411	393	403	475	755	
35	1332	1595	1665	1754	1837	1843	1808	1783	1529	919	473	386	375	379	440	771	
40	1488	1761	1821	1864	1903	1968	1990	1987	1713	935	426	364	364	359	398	776	
45	1639	1926	2038	1963	1843	2077	2207	2163	1901	920	375	354	363	350	354	757	
50	1798	2077	2215	1925	1565	2023	2271	2191	2008	861	331	348	363	344	319	701	
55	1816	1881	1936	1606	1018	1650	1804	1749	1828	724	302	339	355	333	293	594	
60	1365	1018	856	734	407	719	761	860	1200	493	275	318	332	311	267	429	
65	650	280	192	194	192	196	196	280	526	274	241	281	283	275	234	255	
70	241	140	129	160	200	152	134	151	215	175	199	232	229	226	194	167	
75	119	103	101	144	123	125	100	109	120	129	146	152	147	146	141	123	
80	70.6	69.2	59.2	81.8	57.4	70.8	57.1	73.6	75.1	83.7	83.6	85.8	95.9	84.1	80.2	78.2	
85	31.5	27.1	21.8	24.1	16.9	22.2	23.0	31.8	38.1	34.9	36.6	39.5	42.3	38.1	33.4	30.3	
90	0.44	0.48	0.55	0.60	0.65	0.69	0.55	0.46	0.40	0.31	0.31	0.36	0.35	0.35	0.30	0.33	
95	0.25	0.25	0.27	0.32	0.31	0.31	0.26	0.22	0.25	0.21	0.21	0.28	0.25	0.24	0.21	0.20	
100	0.46	0.32	0.29	0.40	0.41	0.41	0.29	0.30	0.43	0.26	0.26	0.29	0.29	0.30	0.30	0.30	
105	1.08	0.60	0.41	0.51	0.55	0.51	0.41	0.56	0.93	0.63	0.57	0.61	0.50	0.76	0.76	0.74	
110	1.91	0.96	0.51	0.60	0.73	0.64	0.51	0.91	1.60	1.29	1.16	1.05	0.99	1.36	1.59	1.52	
115	2.54	1.26	0.59	0.54	0.77	0.60	0.62	1.22	2.00	1.98	1.82	1.29	1.40	1.56	2.47	2.26	
120	2.89	1.50	0.70	0.73	0.73	0.74	0.69	1.43	2.23	2.37	2.35	2.05	1.72	2.38	3.13	2.71	
125	3.21	1.84	0.76	0.82	0.96	0.84	0.75	1.70	2.50	2.67	2.33	2.48	2.94	2.97	3.42	3.14	
130	4.01	1.95	0.81	0.84	0.94	0.85	0.82	1.68	3.51	2.88	2.41	2.77	3.30	3.18	3.79	3.48	
135	3.66	1.83	0.81	0.87	0.88	0.86	0.86	1.63	3.17	2.72	2.55	3.25	3.14	3.83	3.66	3.42	
140	3.23	1.71	0.82	0.89	0.88	0.87	0.77	1.58	2.70	2.63	2.11	3.39	3.07	3.87	2.89	3.41	
145	2.86	1.49	0.88	0.96	0.77	0.90	0.74	1.39	2.40	2.31	2.08	3.00	3.05	3.38	3.11	3.08	
150	2.40	1.39	1.10	1.03	0.96	0.99	0.99	1.38	2.14	2.12	2.38	2.85	3.12	3.16	3.65	2.76	
155	1.85	1.38	1.26	1.16	1.08	1.08	1.13	1.46	1.70	1.96	2.09	2.48	2.48	2.67	3.30	2.42	
160	1.55	1.36	1.35	1.28	1.19	1.18	1.20	1.38	1.64	1.76	1.77	2.12	2.20	2.38	2.61	2.29	
165	1.65	1.42	1.50	1.38	1.35	1.30	1.32	1.41	1.73	1.61	1.64	1.89	1.95	2.01	2.18	2.32	
170	1.80	1.64	1.77	1.78	1.57	1.83	1.72	1.55	1.85	1.84	1.94	2.38	3.11	3.30	3.13	2.77	
175	1.91	1.79	1.95	2.07	2.24	2.11	1.94	1.70	1.91	1.89	1.98	2.23	2.77	3.00	2.78	2.54	
180	1.81	1.93	2.02	2.24	2.48	2.27	2.18	1.79	1.82	1.84	1.89	2.00	2.24	2.45	2.29	2.14	

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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-06-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AOK-300WIS-(D)-X(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170259-P2	120.0	60	2.631	313.8	0.9940	9.35
	277.0	60	1.145	300.0	0.9456	14.87
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

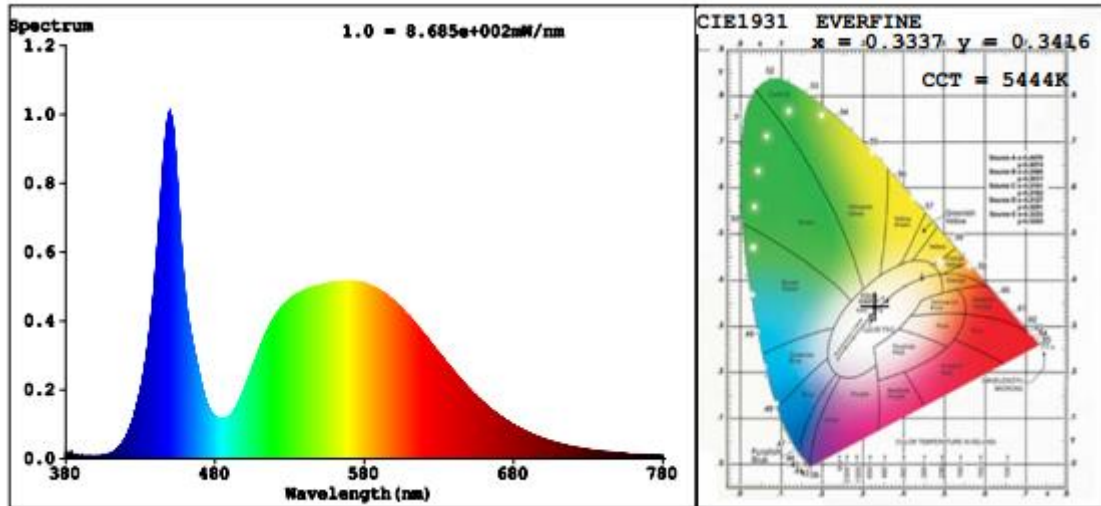
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	75	R9	0
Frequency (Hz)	60	R2	80	R10	50
CCT (K)	5444	R3	82	R11	75
Duv	-0.0003	R4	77	R12	47
Chromaticity (x, y)	x=0.3337 y=0.3416	R5	75	R13	75
Chromaticity (u', v')	u'=0.2075 v'=0.4780	R6	72	R14	89
Color Rendering Index (CRI)	75.9	R7	83	R15	71
R9	0	R8	64	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.1 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	41707	40506	>=1000(-10%)	
Luminous Efficacy (lm/W)	132.91	135.02	Standard: >=	Premium: >=
Most worst Luminous/Highest Watts	129.08		100(-3%)	120(-3%)

Spectral Power Distribution & Chromaticity Diagram



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2.3 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
AOK-300WIS-(D)-X(3000K)	3000K	40540	313.1	129.48
AOK-300WIS-(D)-X(3500K)	3500K	40773 ^{*1}	313.5 ^{*2}	130.06 ^{*3}
AOK-300WIS-(D)-X(4000K)	4000K	41007 ^{*1}	313.5 ^{*2}	130.80 ^{*3}
AOK-300WIS-(D)-X(4500K)	4500K	41240 ^{*1}	313.5 ^{*2}	131.55 ^{*3}
AOK-300WIS-(D)-X(5000K)	5000K	41474 ^{*1}	313.5 ^{*2}	132.29 ^{*3}
AOK-300WIS-(D)-X(5700K)	5700K	41707	313.8	132.91

*1: This value is calculated and the calculation formula is as below:

$$40773 = (41707 - 40540) / 5 + 40540$$

$$41007 = (41707 - 40540) / 5 + 40773$$

$$41240 = (41707 - 40540) / 5 + 41007$$

$$41474 = (41707 - 40540) / 5 + 41240$$

*2: This value is calculated and the calculation formula is as below:

$$313.5 = (313.1 + 313.8) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$130.06 = 40773 / 313.5$$

$$130.80 = 41007 / 313.5$$

$$131.55 = 41240 / 313.5$$

$$132.29 = 41474 / 313.5$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-327	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-12	2017-07-11
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
GO-R5000	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-12	2017-07-11
PF210	Power Meter for Goniophotometer	2016-07-07	2017-07-06
Expand Uncertainty: Photometric Measurement (Sphere):2.04%, k=2 Chromaticity Measurement(Sphere):28.8K, k=2 Photometric Measurement(Goniophotometer):2.36%, k=2			

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