



Report No.: GZE151161-K

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

AOK LED LIGHT COMPANY LIMITED

(Brand Name: AOK)

Building 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-225WiT-HV

Representative (Tested) Model: AOK-225WiT-HV(3000K)
AOK-225WiT-HV(5700K)

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

Test & Report By:

Johnson Sun

Engineer: Johnson Sun

Date: Feb.01,2016

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>

Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
AOK-225WiT-HV(3000K)	3000	28615	230.7	124.05
AOK-225WiT-HV(3500K)	3500	29044 ^{*1}	231.6 ^{*2}	125.43 ^{*3}
AOK-225WiT-HV(4000K)	4000	29473 ^{*1}	231.6 ^{*2}	127.28 ^{*3}
AOK-225WiT-HV(4500K)	4500	29901 ^{*1}	231.6 ^{*2}	129.14 ^{*3}
AOK-225WiT-HV(5000K)	5000	30330 ^{*1}	231.6 ^{*2}	130.99 ^{*3}
AOK-225WiT-HV(5700K)	5700	30759	232.4	132.35

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

$$29044 = (30759 - 28615) / 5 + 28615$$

$$29473 = (30759 - 28615) / 5 + 29044$$

$$29901 = (30759 - 28615) / 5 + 29473$$

$$30330 = (30759 - 28615) / 5 + 29901$$

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

$$231.6 = (232.4 + 230.7) / 2$$

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

$$125.43 = 29044 / 231.6$$

$$127.28 = 29473 / 231.6$$

$$129.14 = 29901 / 231.6$$

$$130.99 = 30330 / 231.6$$

U.S. Department of Energy

Lighting Facts™ Uniform LM-79 Reporting Template

Laboratory Information:

Name of Test Laboratory	Standard-Tech Co. Ltd
Date of Test Report	Feb.01,2016
Test Report No.	GZE151161-K
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	AOK LED LIGHT COMPANY LIMITED		
Brand Name	AOK		
Model Number	AOK-225WiT-HV(3000K)		
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		
Luminaire Aperture (for downlights)	--	in.	
Luminaire Length	--	mm	
Luminaires Width	--	mm	
Number of Units (modular products)	N/A	s	

Integrating Sphere

Goniophotometer

Electrical Measurements:

	Output	Output	
Input Wattage	--	230.7	W
Input Current	--	0.8418	A
Input Voltage (ac)	--	277.0	V
Power Factor	--	0.9893	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	28615	lm
Initial Lumen Efficacy	--	124.05	lm/w
Correlated color temperature / CCT	3048	--	K
Color rendering index / CRI	72.1	--	
R9 Value	0	--	
Duv	-0.0018	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)		7839	cd
Beam angle (if applicable)		95.9	°
Zonal lumens in the 0°-60° zone		89.2	%
Zonal lumens in the 60°-90° zone	-----	10.6	%
Zonal lumens in the 90°-120° zone		0	%
Zonal lumens in the 120°-180° zone		0.2	%

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Laboratory Information:

Name of Test Laboratory	Standard-Tech Co. Ltd
Date of Test Report	Feb.01,2016
Test Report No.	GZE151161-K
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	AOK LED LIGHT COMPANY LIMITED		
Brand Name	AOK		
Model Number	AOK-225WiT-HV(5700K)		
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		
Luminaire Aperture (for downlights)	--	in.	
Luminaire Length	--	mm	
Luminaires Width	--	mm	
Number of Units (modular products)	N/A	s	

Integrating Sphere
Goniophotometer
Electrical Measurements:
Output
Output

Input Wattage	232.4	--	W
Input Current	0.8529	--	A
Input Voltage (ac)	277.0	--	V
Power Factor	0.9837	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	30759	--	lm
Initial Lumen Efficacy	132.35	--	lm/w
Correlated color temperature / CCT	5843	--	K
Color rendering index / CRI	75.7	--	
R9 Value	0	--	
Duv	-0.0007	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)			cd
Beam angle (if applicable)			°
Zonal lumens in the 0°-60° zone			%
Zonal lumens in the 60°-90° zone	-----	-----	%
Zonal lumens in the 90°-120° zone			%
Zonal lumens in the 120°-180° zone			%

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Test Specifications:	
Date of Receipt	: Dec.14,2015
Date of Test	: Jan.25,2016
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

Test Methods

1. Photometric and Electrical measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 277 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.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 277 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

1. Product Information:

Brand Name	AOK
Model Number	AOK-225WiT-HV
Luminaire Type	Outdoor Pole/Arm-mounted Area and Roadway Luminaires
Rated Voltage / Frequency	277~ 480Vac, 50/60Hz
Nominal Power	225W
Rated Initial Lamp Lumen	--
Declared CCT	3000K,3500K,4000K,4500K,5000K,5700K
LED Manufacturer	Philips Lumileds
LED Model	LUXEON 3030 2D
Sample Receipt Date	Dec.14,2015
Sample Number	GZE151161-K1(3000K),K2(5700K)

Photo



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2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2016-01-30	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AOK-225WiT-HV(3000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE151161	277.0	60	0.8418	230.7	0.9893	6.26
-K1	480.0	60	0.5100	229.0	0.9354	9.71

Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	69	R9	0
Frequency (Hz)	60	R2	83	R10	60
Color Rendering Index (CRI)	72.1	R3	93	R11	59
R9	0	R4	66	R12	49
CCT (K)	3048	R5	67	R13	71
Chromaticity (x, y)	x=0.4310 y=0.3975	R6	75	R14	96
Chromaticity (u', v')	u'=0.2496 v'=0.5179	R7	78	R15	63
Duv	-0.0018	R8	46	--	--

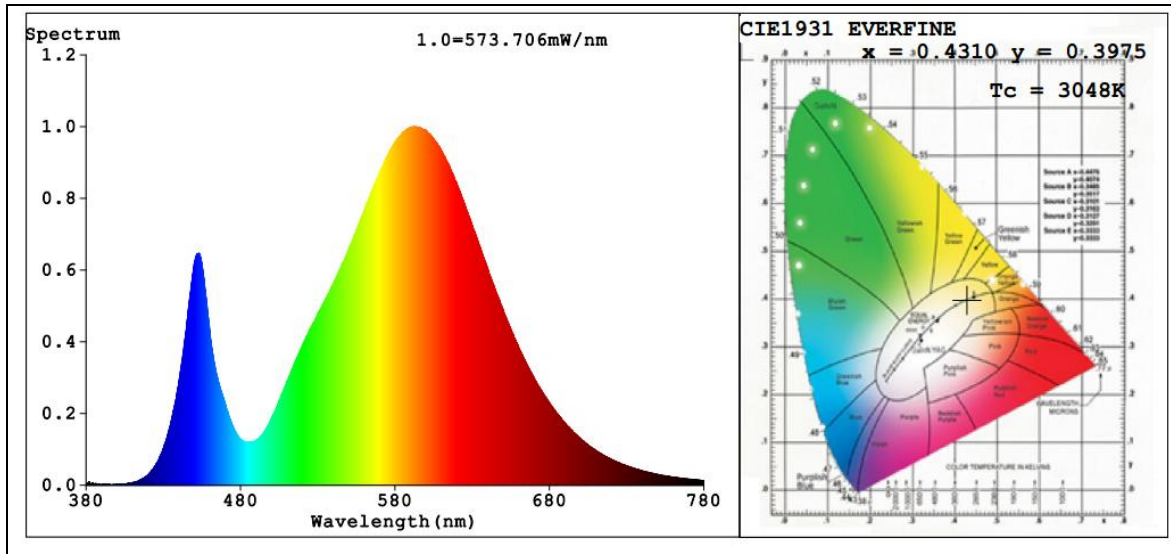
Goniophotometer Method:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	28615
Luminous Efficacy (lm/W)	124.05
Beam Angle°	95.9
Center Beam Candle Power (cd)	7839

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	480.0
Frequency (Hz)	60
Total Luminous (lm)	28432
Luminous Efficacy (lm/W)	124.14

Spectral Power Distribution & Chromaticity Diagram



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Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	6,768.4	23.7%
0-40	12,103.4	42.3%
0-60	25,529.9	89.2%
60-90	3,025.7	10.6%
70-100	1,019.3	3.6%
90-120	12.3	0%
0-90	28,555.6	99.8%
90-180	54.8	0.2%
0-180	28,610.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	739.3	2.6%	90-100	1.0	0%
10-20	2,189.0	7.7%	100-110	3.2	0%
20-30	3,840.0	13.4%	110-120	8.0	0%
30-40	5,335.0	18.6%	120-130	11.4	0%
40-50	7,101.2	24.8%	130-140	11.5	0%
50-60	6,325.3	22.1%	140-150	8.7	0%
60-70	2,007.5	7.0%	150-160	6.0	0%
70-80	857.8	3.0%	160-170	3.6	0%
80-90	160.4	0.6%	170-180	1.4	0%

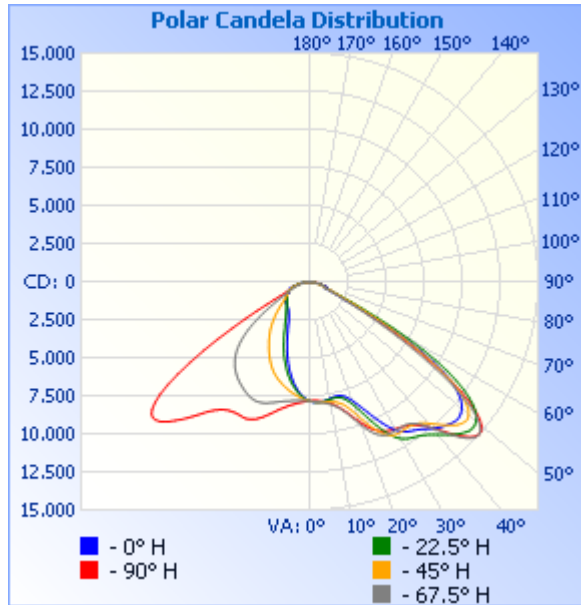
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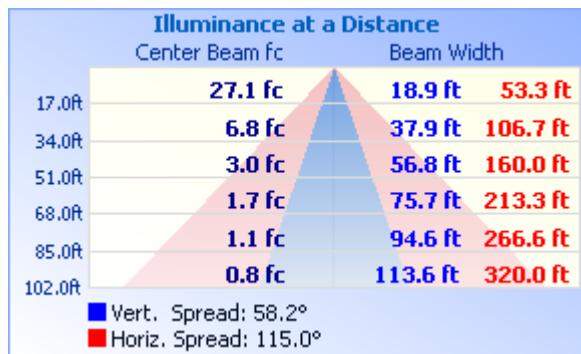
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Photometric Data



Illuminance Plots



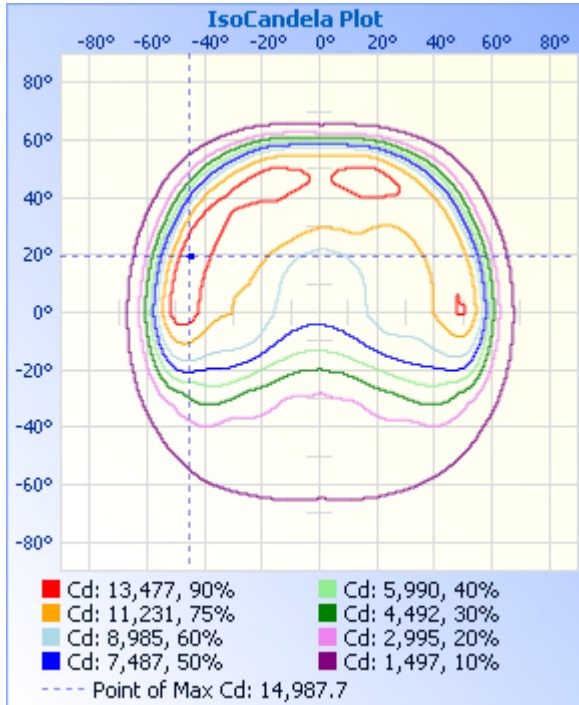
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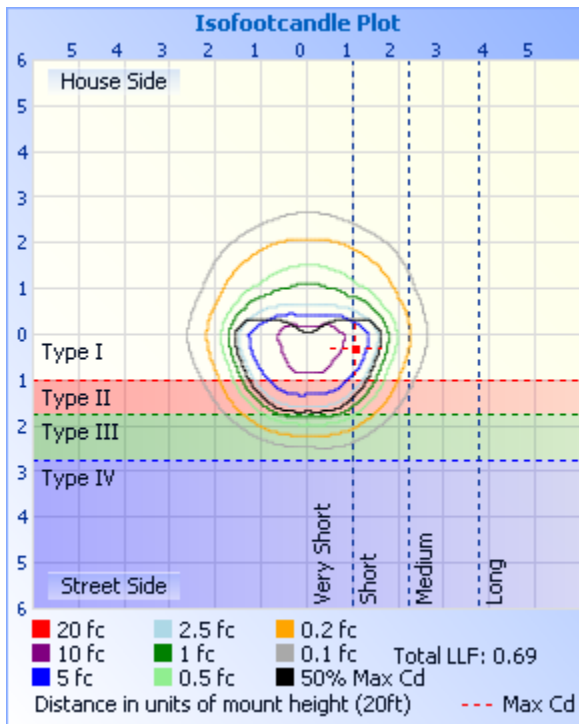
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ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	7839	7839	7839	7839	7839	7839	7839	7839	7839	7839	7839	7839	7839	7839	7839	7839	7839
1	7888	7879	7869	7853	7829	7804	7790	7779	7775	7786	7806	7830	7855	7874	7883	7889	7888
2	7921	7908	7891	7870	7824	7783	7736	7702	7694	7720	7766	7824	7877	7911	7924	7927	7921
3	7937	7927	7910	7893	7829	7765	7680	7615	7596	7640	7719	7820	7906	7949	7959	7952	7937
4	7942	7932	7927	7920	7843	7749	7618	7515	7482	7544	7667	7823	7942	7992	7992	7967	7942
5	7938	7931	7940	7950	7865	7736	7550	7401	7352	7435	7613	7832	7983	8037	8019	7971	7938
6	7923	7923	7954	7984	7896	7729	7480	7280	7213	7318	7556	7848	8033	8084	8041	7966	7923
7	7898	7905	7969	8026	7935	7728	7408	7143	7057	7192	7497	7867	8087	8133	8059	7953	7898
8	7866	7883	7982	8075	7989	7737	7334	7002	6887	7057	7437	7889	8148	8184	8071	7934	7866
9	7828	7860	7997	8135	8056	7753	7262	6849	6707	6913	7375	7919	8219	8240	8082	7911	7828
10	7789	7837	8017	8203	8133	7775	7185	6694	6519	6763	7313	7951	8298	8303	8096	7885	7789
11	7753	7819	8046	8284	8223	7803	7110	6527	6325	6602	7247	7985	8387	8376	8115	7860	7753
12	7728	7808	8087	8383	8332	7839	7031	6358	6121	6439	7179	8024	8483	8459	8143	7845	7728
13	7717	7812	8147	8503	8459	7888	6951	6180	5910	6266	7104	8070	8589	8549	8184	7842	7717
14	7724	7836	8228	8649	8608	7947	6873	5994	5688	6089	7033	8124	8708	8653	8236	7857	7724
15	7753	7884	8335	8823	8773	8017	6794	5807	5466	5906	6960	8181	8838	8773	8307	7894	7753
16	7808	7965	8482	9026	8957	8094	6716	5612	5234	5717	6884	8239	8975	8910	8402	7959	7808
17	7894	8087	8665	9256	9165	8179	6634	5414	4997	5524	6805	8299	9115	9051	8520	8060	7894
18	8010	8253	8885	9513	9390	8274	6551	5213	4769	5329	6723	8358	9254	9194	8662	8196	8010
19	8163	8459	9146	9790	9621	8376	6467	5009	4537	5134	6635	8420	9389	9331	8829	8365	8163
20	8353	8716	9422	10069	9856	8478	6376	4803	4311	4937	6541	8476	9522	9462	9021	8571	8353
21	8572	9010	9731	10338	10089	8582	6276	4599	4094	4736	6446	8524	9640	9581	9228	8811	8572
22	8826	9336	10043	10592	10302	8676	6178	4396	3891	4543	6344	8559	9743	9683	9440	9083	8826
23	9105	9691	10359	10814	10500	8758	6073	4200	3697	4347	6237	8585	9824	9762	9657	9369	9105
24	9406	10057	10649	10983	10667	8828	5960	4009	3512	4157	6123	8595	9881	9811	9863	9668	9406
25	9728	10431	10908	11117	10813	8885	5841	3825	3352	3972	5997	8587	9913	9831	10046	9970	9728
26	10055	10788	11131	11212	10926	8925	5721	3649	3214	3800	5868	8567	9919	9824	10206	10276	10055
27	10384	11129	11303	11270	11014	8942	5593	3489	3077	3639	5736	8536	9911	9795	10328	10574	10384
28	10700	11437	11427	11292	11078	8943	5457	3339	2940	3485	5600	8495	9899	9750	10416	10844	10700

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29	10986	11692	11504	11292	11135	8925	5322	3216	2839	3346	5469	8443	9895	9707	10466	11075	10986
30	11231	11895	11539	11281	11181	8891	5185	3092	2748	3226	5338	8382	9905	9671	10488	11272	11231
31	11436	12042	11546	11278	11225	8841	5051	2969	2666	3105	5199	8321	9932	9651	10495	11430	11436
32	11608	12151	11536	11284	11277	8782	4915	2868	2595	2985	5059	8255	9981	9653	10499	11566	11608
33	11743	12237	11530	11297	11339	8704	4774	2778	2531	2884	4920	8182	10046	9691	10511	11678	11743
34	11842	12312	11535	11330	11417	8616	4640	2694	2474	2793	4786	8116	10139	9765	10538	11779	11842
35	11926	12391	11553	11399	11515	8522	4502	2618	2423	2706	4650	8041	10260	9885	10588	11888	11926
36	12024	12482	11599	11519	11644	8416	4364	2546	2375	2628	4514	7961	10413	10041	10670	12022	12024
37	12137	12604	11674	11689	11802	8296	4226	2481	2330	2554	4378	7875	10602	10240	10784	12184	12137
38	12275	12740	11789	11914	11997	8169	4090	2420	2290	2486	4240	7781	10829	10481	10926	12388	12275
39	12426	12919	11952	12213	12238	8029	3948	2362	2253	2423	4103	7687	11105	10764	11102	12622	12426
40	12577	13119	12151	12564	12527	7881	3807	2309	2222	2364	3958	7582	11412	11084	11306	12864	12577
41	12719	13324	12382	12962	12867	7719	3665	2259	2195	2309	3814	7473	11733	11419	11528	13115	12719
42	12851	13541	12629	13381	13258	7544	3522	2212	2172	2257	3669	7347	12059	11759	11759	13364	12851
43	12963	13750	12873	13796	13664	7358	3381	2171	2150	2208	3521	7208	12376	12096	11999	13611	12963
44	13063	13924	13122	14178	14046	7162	3240	2133	2128	2165	3378	7056	12678	12432	12240	13849	13063
45	13157	14084	13342	14519	14392	6958	3100	2099	2108	2124	3228	6890	12968	12741	12469	14072	13157
46	13231	14231	13530	14784	14684	6736	2959	2069	2088	2088	3079	6708	13233	13008	12681	14261	13231
47	13263	14353	13658	14950	14885	6498	2823	2042	2069	2053	2930	6502	13449	13203	12858	14388	13263
48	13237	14396	13740	14988	14975	6250	2693	2017	2048	2022	2788	6270	13591	13294	12986	14464	13237
49	13161	14367	13743	14875	14932	5987	2568	1994	2027	1994	2650	6014	13635	13268	13051	14482	13161
50	13035	14262	13634	14588	14736	5695	2449	1973	2006	1967	2518	5741	13552	13093	13029	14429	13035
51	12856	14084	13425	14126	14392	5396	2339	1952	1982	1941	2392	5441	13311	12759	12905	14295	12856
52	12599	13817	13087	13486	13864	5073	2236	1932	1955	1917	2273	5109	12898	12238	12656	14058	12599
53	12249	13449	12617	12653	13170	4744	2144	1912	1926	1893	2165	4763	12296	11530	12265	13698	12249
54	11817	12949	12011	11662	12307	4402	2063	1891	1895	1870	2068	4393	11509	10645	11720	13208	11817
55	11250	12341	11256	10542	11303	4051	1993	1869	1861	1846	1982	4013	10560	9601	10999	12587	11250
56	10560	11611	10367	9323	10170	3704	1932	1846	1829	1821	1910	3654	9472	8476	10140	11819	10560
57	9687	10772	9377	8088	8974	3377	1878	1821	1795	1796	1847	3294	8299	7287	9147	10901	9687
58	8607	9790	8318	6853	7763	3049	1832	1795	1758	1770	1792	2934	7102	6118	8051	9785	8607
59	7370	8674	7204	5694	6576	2723	1791	1767	1717	1742	1744	2576	5929	5028	6901	8511	7370

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60	6084	7469	6132	4672	5502	2450	1755	1735	1671	1711	1704	2299	4881	4067	5782	7158	6084
61	4793	6208	5082	3763	4513	2205	1719	1700	1614	1677	1665	2057	3950	3254	4726	5754	4793
62	3676	5002	4152	3020	3821	1998	1683	1662	1547	1641	1627	1864	3199	2612	3809	4498	3676
63	2737	3917	3332	2436	3128	1820	1646	1622	1505	1603	1589	1705	2605	2129	3017	3448	2737
64	2007	3028	2654	1996	2440	1676	1608	1578	1491	1562	1549	1579	2145	1763	2389	2618	2007
65	1686	2309	2118	1672	2031	1554	1565	1531	1483	1519	1506	1475	1823	1583	1912	1994	1686
66	1369	1783	1709	1479	1727	1449	1517	1481	1475	1473	1458	1383	1680	1404	1652	1703	1369
67	1052	1542	1462	1289	1521	1353	1468	1426	1464	1423	1409	1294	1536	1225	1398	1412	1052
68	1011	1306	1218	1180	1381	1260	1416	1367	1447	1369	1354	1208	1393	1152	1144	1121	1011
69	999	1069	1078	1104	1288	1171	1360	1308	1420	1312	1296	1126	1343	1105	1022	1070	999
70	1003	1036	971	1058	1222	1086	1301	1253	1382	1256	1235	1043	1311	1065	934	1086	1003
71	1112	1027	879	1039	1162	1000	1241	1200	1333	1200	1175	955	1275	1010	863	1097	1112
72	1230	1007	798	1015	1108	913	1177	1149	1271	1146	1112	869	1230	934	798	1094	1230
73	1168	975	730	945	1055	831	1111	1093	1196	1087	1049	788	1169	844	737	1067	1168
74	999	914	667	850	995	756	1045	1032	1110	1026	986	717	1083	754	680	1002	999
75	805	823	610	751	916	691	978	960	1019	953	921	652	975	672	623	908	805
76	655	726	557	660	824	633	909	890	930	883	853	597	854	592	558	799	655
77	541	632	498	576	722	581	835	816	839	809	777	547	730	513	490	676	541
78	442	521	437	498	622	534	749	740	750	731	687	502	610	441	421	536	442
79	352	409	378	426	532	489	641	661	662	652	580	459	509	373	359	408	352
80	282	311	324	364	452	445	506	582	573	570	452	414	421	320	305	302	282
81	235	229	276	308	382	398	395	501	484	487	348	365	337	274	252	218	235
82	198	164	226	260	312	352	328	419	395	398	283	317	260	232	197	155	198
83	161	117	178	218	254	304	263	332	305	306	222	267	218	190	150	108	161
84	120	79	137	175	212	248	195	243	219	216	170	214	183	148	110	72	120
85	76	51	99	133	174	191	142	163	136	136	120	160	149	110	76	46	76
86	34	28	66	94	138	138	94	93	61	70	75	111	112	74	46	24	34
87	5	10	34	56	92	84	53	27	8	14	38	65	68	40	19	6	5
88	2	2	9	18	21	15	11	5	4	5	8	6	7	5	2	1	2
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90	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1

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

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91	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
92	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
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Laboratory: Standard-Tech Co. Ltd Testing Center
 NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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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

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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

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2.2 Electrical, Photometric and Chromaticity Measurements <i>(Refer to Work Instruction QD25)</i>	IES LM-79 2008
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Test date	2016-01-30	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AOK-225WiT-HV(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE151161	277.0	60	0.8529	232.4	0.9837	6.05
-K2	480.0	60	0.5154	230.7	0.9326	9.52

Sphere-Spectroradiometer Method:

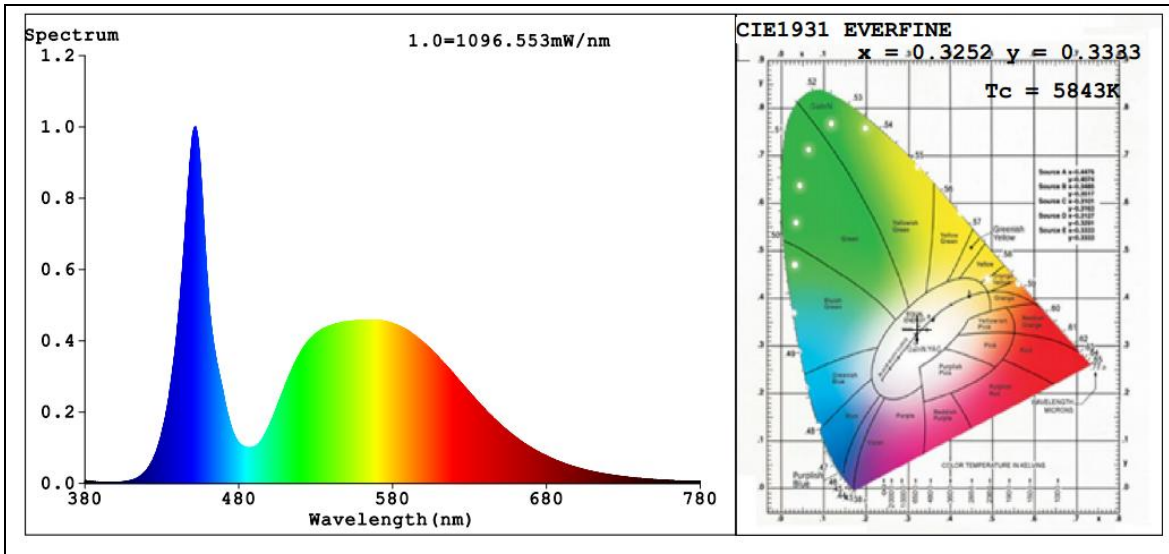
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Color Rendering Index (CRI)	75.7
R9	0
CCT (K)	5843
Chromaticity (x, y)	x=0.3252 y=0.3333
Chromaticity (u', v')	u'=0.2049 v'=0.4725
Duv	-0.0007
Total Luminous (lm)	30759
Luminous Efficacy (lm/W)	132.35

Special Color Rendering Indices			
R1	75	R9	0
R2	80	R10	50
R3	81	R11	736
R4	77	R12	43
R5	75	R13	76
R6	71	R14	89
R7	84	R15	72
R8	64	--	--

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	480.0
Frequency (Hz)	60
Total Initial Lumen Output(lm)	30572
Initial Lumen Efficacy(lm/w)	132.52

Spectral Power Distribution & Chromaticity Diagram



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 NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2015-07-01	2016-06-30
ST-R-331	Spectral analysis system HAAS-2000	2015-07-01	2016-06-30
D204	Standard Lamp	2015-07-01	2016-06-30
PF2010	Power Meter for Integrating Sphere	2015-07-01	2016-06-30
EE-09	Goniophotometer system	2015-07-01	2016-06-30
D908S	Standard Lamp	2015-07-01	2016-06-30
PF210	Power Meter for Goniophotometer	2015-07-01	2016-06-30
ST-R-181A	Temperature Tester	2015-07-01	2016-06-30
Uncertainty Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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