



Report No.: BLC2105009E-A-R

## LM-79-08 Test Report

For

**IKIO LED LIGHTING, LLC**

**(Brand Name: IKIO)**

8470 Allison Pointe Blvd, Suite 128 Indianapolis, IN 46250

### **Low Bay Luminaires for Commercial and Industrial Buildings**

Model name(s): IK-LLB04-40W-30/40/50K-MV-WH

Remark: "a" can be any two letters for housing color; "b" can be "R" for PIR sensor provided, "M"= Microwave Sensor provided or blank for not; "c" can be "E" for emergency power provided or blank for not; "d" can be any two digits for CCT.

Representative (Tested) Model:

IK-LLB04-40W-30/40/50K-MV-WH (40W,3000K)

IK-LLB04-40W-30/40/50K-MV-WH (40W,6500K)

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

Test & Report By:

*Sophie Yang*

Engineer: Sophie Yang

Date: 2021-06-02

Update: update the model number in TM30 screenshot for 3000K CCT

Review By:

*Jason Luo*

Manager: Jason Luo

Laboratory: Belling Test Laboratory Co., LTD A2LA Certificate# 4810.01

Unit 401, No. 309 Xinxin Seven Road, Zengcheng District,  
Guangzhou, People's Republic of China engineer@etk-utest.com

Report Format Number BL-FM-SA-012

1 / 20



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### 1.1 Product Information:

Organization Name	IKIO LED LIGHTING, LLC	
Brand Name	IKIO	
Model Number	IK-LLB04-40W-30/40/50K-MV-WH	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Low Bay Luminaires for Commercial and Industrial Buildings	
Rated Voltage / Frequency	120-277 VAC, 50/60 Hz	
Nominal Power	40W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K,4500K,5000K,5700K,6500 K	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-3080RA35002U1	
Sample Number	BLC2105009E-A1(3000K), A2 (6500K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s
<b>Photo</b>		
		
		



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## 1.2 Test Specifications:

Date of Receipt	2021-05-15
Date of Test	2021-05-20
Test item	<ol style="list-style-type: none"><li>1. Total Luminous Flux</li><li>2. Luminous Distribution Intensity</li><li>3. Luminous Efficacy</li><li>4. Correlated Color Temperature</li><li>5. Color Rendering Index</li><li>6. Chromaticity Coordinate</li><li>7. Electrical Parameters</li></ol>
Reference Standard	<ol style="list-style-type: none"><li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li><li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li><li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li><li>4. CIE 15-2004 Technical Report Colorimetry</li><li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li><li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li></ol>
Reference Work Instruction	BL-QP-033

## 1.3 Test Methods

### 1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , 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 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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  horizontal intervals.

### 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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . 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 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.

### 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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . 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.



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**2.1 Electrical, Photometric and Chromaticity Measurements***(Refer to Work Instruction BL-QP-033)*

<b>Test date</b>	2021-05-20	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	IK-LLB04-40W-30/40/50K-MV-WH (40W,3000K)		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC210500	120.0	60	0.320	38.33	0.997	6.87
9E-A1	277.0	60	0.140	37.57	0.966	9.03
<b>DLC Pass Criteria</b>					$\geq 0.9(-3\%)$	$\leq 20(+5)$

**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	17
Frequency (Hz)	60	R2	91	R10	80
CCT (K)	2897	R3	97	R11	83
Duv	-0.0011	R4	83	R12	74
Chromaticity (x, y)	x=0.4428 y=0.4033	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2547 v'=0.5219	R6	90	R14	99
Color Rendering Index (CRI)	84	R7	83	R15	76
R9	17	R8	63	--	--
Rf	85	--	--	--	--
Rg	98	--	--	--	--
Rcs,h1 (%)	-10	--	--	--	--

**Photometric Measurement – Goniophotometer Method:**

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	5036.6	4893.9	5000-10000lm (-10%)
Luminous Efficacy (lm/W)	131.40	130.26	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	127.68		
Zonal lumens in the 20-50 °zone (%)	37.70	--	>=30(-10)
Beam Angle ( °)	138.5	--	--
Center Beam Candle Power (cd)	1329	--	--

Laboratory: Belling Test Laboratory Co., LTD A2LA Certificate# 4810.01

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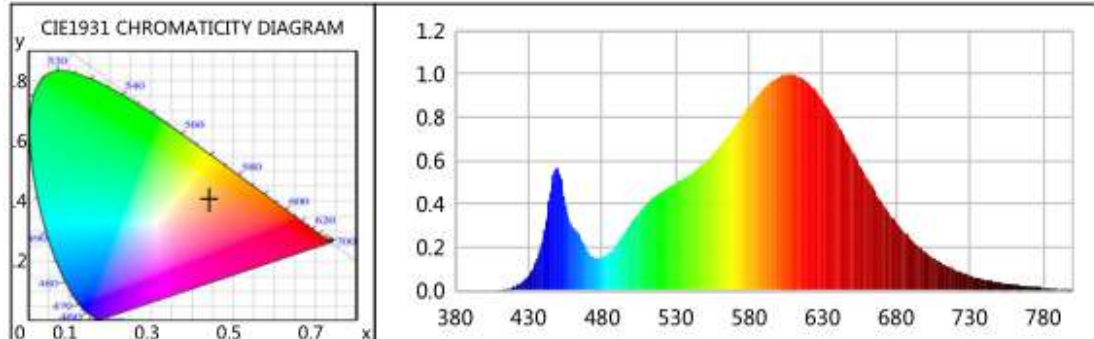
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## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0125	525	0.4751	49.9626	670	0.4087	42.9854
385	0.0004	0.0390	530	0.4942	51.9728	675	0.3571	37.5537
390	0.0004	0.0463	535	0.5147	54.1306	680	0.3132	32.9340
395	0.0003	0.0339	540	0.5371	56.4845	685	0.2719	28.5915
400	0.0007	0.0706	545	0.5614	59.0367	690	0.2371	24.9393
405	0.0009	0.0936	550	0.5912	62.1747	695	0.2043	21.4856
410	0.0020	0.2083	555	0.6262	65.8533	700	0.1758	18.4859
415	0.0071	0.7447	560	0.6658	70.0202	705	0.1506	15.8362
420	0.0175	1.8362	565	0.7092	74.5775	710	0.1295	13.6184
425	0.0370	3.8932	570	0.7548	79.3794	715	0.1112	11.6890
430	0.0717	7.5421	575	0.8021	84.3485	720	0.0953	10.0265
435	0.1327	13.9546	580	0.8486	89.2462	725	0.0822	8.6465
440	0.2496	26.2491	585	0.8912	93.7240	730	0.0693	7.2925
445	0.4575	48.1114	590	0.9310	97.9053	735	0.0581	6.1078
450	0.5629	59.1989	595	0.9616	101.1227	740	0.0511	5.3777
455	0.4006	42.1266	600	0.9864	103.7344	745	0.0444	4.6669
460	0.2913	30.6373	605	0.9965	104.7961	750	0.0376	3.9542
465	0.2484	26.1261	610	0.9981	104.9667	755	0.0326	3.4234
470	0.1832	19.2613	615	0.9871	103.8054	760	0.0276	2.9011
475	0.1497	15.7465	620	0.9599	100.9430	765	0.0210	2.2035
480	0.1549	16.2857	625	0.9237	97.1440	770	0.0206	2.1671
485	0.1749	18.3885	630	0.8766	92.1819	775	0.0162	1.7070
490	0.2103	22.1207	635	0.8259	86.8573	780	0.0125	1.3162
495	0.2604	27.3857	640	0.7683	80.7952	785	0.0098	1.0338
500	0.3121	32.8224	645	0.7058	74.2257	790	0.0118	1.2422
505	0.3581	37.6598	650	0.6441	67.7305	795	0.0087	0.9126
510	0.3978	41.8315	655	0.5816	61.1599	800	0.0065	0.6871
515	0.4278	44.9911	660	0.5233	55.0357			
520	0.4540	47.7404	665	0.4644	48.8331			

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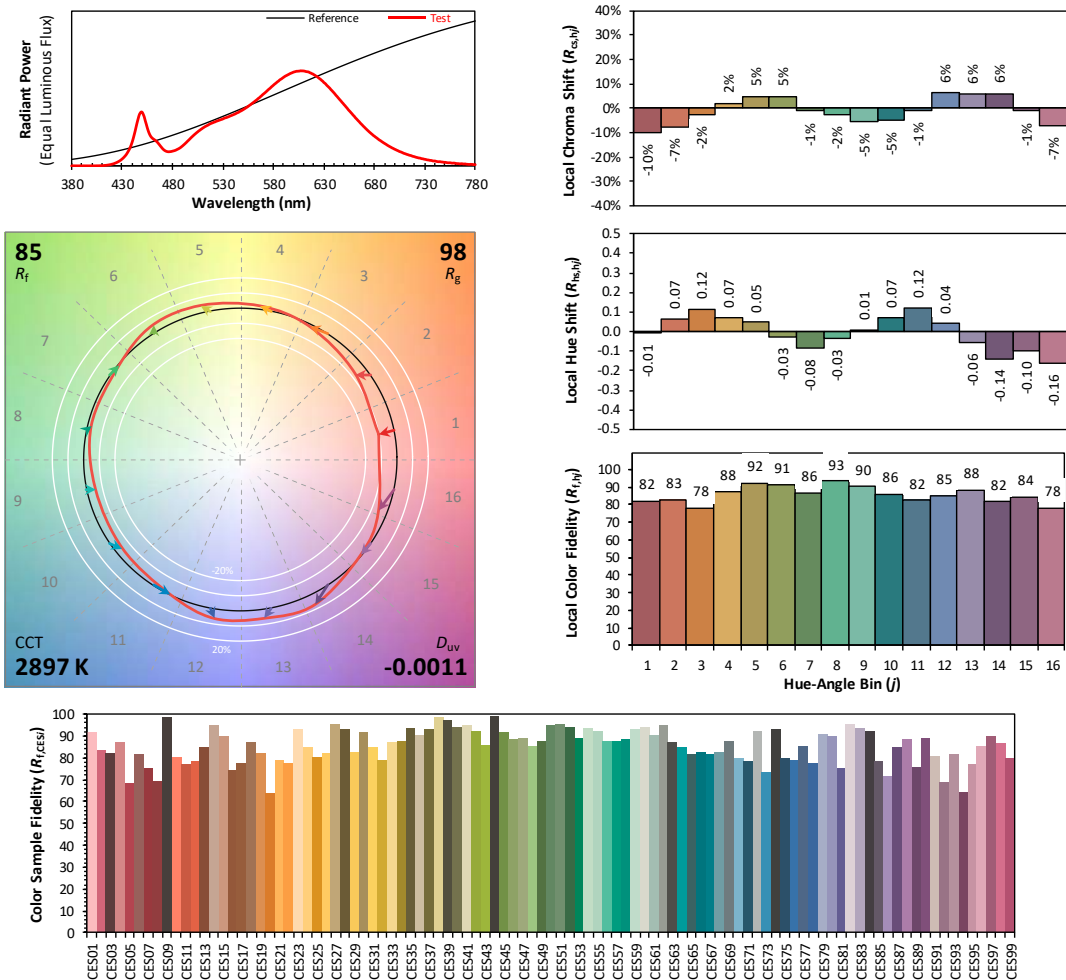


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TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35002U1  
Date: 2021/5/20  
Manufacturer: IKIO LED LIGHTING  
Model: IK-LLB04-40W-30/40/50K-MV-WH (40W, 3000K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$	0.4428
$y$	0.4033
$u'$	0.2547
$v'$	0.5219

CIE 13.3-1995 (CRI)	
$R_a$	84
$R_9$	17

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



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## Zonal Lumen Tabulation

### Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	1,032.3	20.5%	20.5%
0-40	1,693.6	33.6%	33.6%
0-60	3,051.4	60.6%	60.6%
60-90	1,332.5	26.5%	26.5%
70-100	992.4	19.7%	19.7%
90-120	499.6	9.9%	9.9%
0-90	4,383.9	87%	87%
90-180	652.5	13%	13%
0-180	5,036.4	100%	100%

### Lumens Per Zone

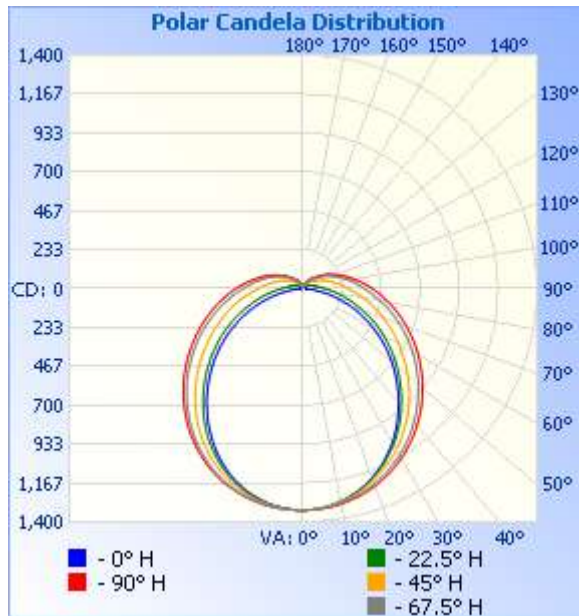
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	125.7	2.5%	90-100	228.1	4.5%
10-20	360.2	7.2%	100-110	162.0	3.2%
20-30	546.4	10.8%	110-120	109.5	2.2%
30-40	661.4	13.1%	120-130	68.8	1.4%
40-50	697.1	13.8%	130-140	41.9	0.8%
50-60	660.7	13.1%	140-150	24.1	0.5%
60-70	568.2	11.3%	150-160	12.1	0.2%
70-80	444.5	8.8%	160-170	5.0	0.1%
80-90	319.8	6.3%	170-180	1.2	0%





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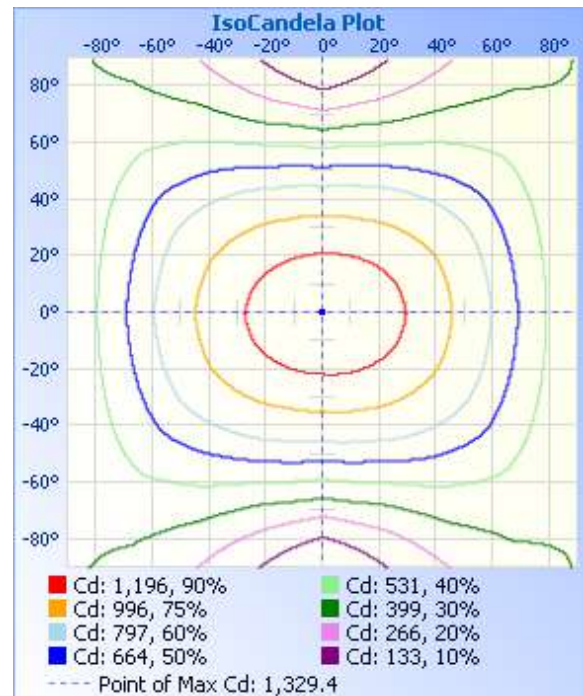
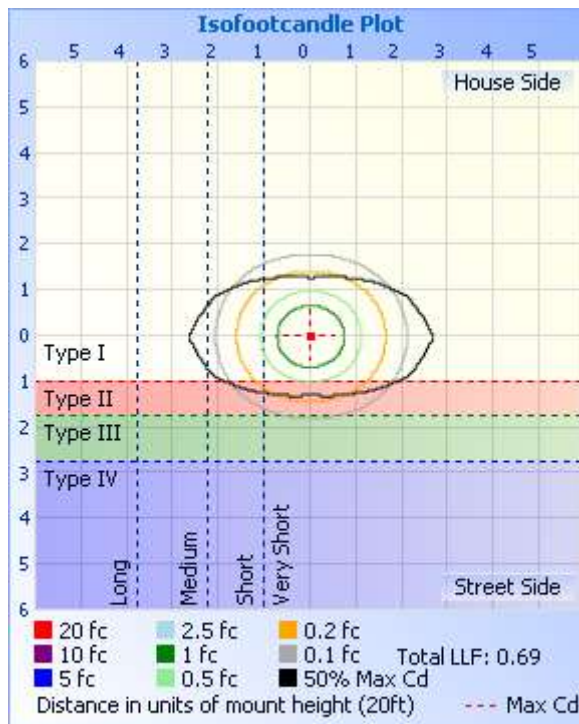
## Photometric Data



**Illuminance at a Distance**

	Center Beam fc	Beam Width
17.0ft	4.60 fc	43.2 ft 89.7 ft
34.0ft	1.15 fc	86.4 ft 179.4 ft
51.0ft	0.51 fc	129.6 ft 269.0 ft
68.0ft	0.29 fc	172.9 ft 358.7 ft
85.0ft	0.18 fc	216.1 ft 448.4 ft
102.0ft	0.13 fc	259.3 ft 538.1 ft

■ Vert. Spread: 103.6°  
■ Horiz. Spread: 138.5°



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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	1329	1329	1329	1329	1329	1329	1329	1329	1329	1329	1329	1329	1329	1329	1329	1329	1329
1	1328	1328	1328	1328	1329	1328	1328	1328	1329	1329	1329	1329	1329	1329	1328	1328	1328
2	1327	1326	1327	1327	1328	1327	1327	1328	1327	1328	1328	1328	1329	1328	1328	1328	1327
3	1325	1324	1325	1326	1327	1325	1325	1326	1326	1327	1327	1329	1328	1328	1327	1326	1325
4	1323	1322	1323	1324	1326	1324	1323	1324	1324	1325	1326	1328	1327	1327	1326	1324	1323
5	1320	1319	1320	1321	1324	1322	1321	1322	1322	1323	1325	1327	1326	1326	1324	1322	1320
6	1317	1316	1317	1319	1322	1320	1318	1319	1318	1320	1323	1325	1325	1324	1321	1318	1317
7	1312	1312	1313	1316	1320	1317	1315	1315	1315	1317	1320	1323	1323	1321	1318	1315	1312
8	1308	1307	1309	1313	1317	1314	1311	1311	1310	1313	1317	1321	1322	1319	1315	1311	1308
9	1302	1301	1305	1309	1314	1311	1307	1306	1306	1309	1313	1318	1319	1316	1311	1306	1302
10	1296	1296	1299	1305	1311	1307	1303	1300	1300	1304	1309	1316	1317	1314	1306	1301	1296
11	1290	1290	1294	1301	1307	1303	1297	1295	1294	1298	1305	1312	1314	1310	1301	1295	1290
12	1284	1283	1288	1296	1303	1298	1292	1287	1287	1292	1300	1308	1310	1306	1296	1288	1284
13	1276	1275	1282	1291	1299	1293	1286	1281	1280	1286	1294	1304	1305	1302	1291	1281	1276
14	1267	1267	1275	1286	1294	1288	1279	1273	1272	1278	1288	1300	1302	1297	1285	1274	1267
15	1258	1260	1268	1280	1289	1284	1272	1265	1264	1271	1282	1294	1297	1292	1279	1266	1258
16	1249	1250	1261	1274	1284	1277	1265	1257	1255	1262	1275	1289	1293	1287	1271	1257	1249
17	1240	1241	1252	1268	1278	1271	1257	1247	1244	1254	1268	1284	1288	1281	1264	1248	1240
18	1229	1231	1244	1260	1272	1264	1249	1237	1235	1244	1260	1277	1282	1275	1256	1239	1229
19	1219	1221	1235	1254	1266	1257	1240	1228	1224	1235	1251	1271	1276	1268	1247	1228	1219
20	1207	1210	1226	1246	1259	1250	1232	1217	1213	1224	1243	1264	1270	1261	1239	1217	1207
21	1195	1200	1216	1238	1252	1242	1222	1206	1202	1214	1234	1257	1264	1253	1230	1206	1195
22	1183	1187	1207	1230	1245	1234	1213	1194	1190	1202	1225	1249	1257	1246	1219	1195	1183
23	1169	1175	1196	1221	1236	1226	1203	1183	1176	1191	1215	1240	1250	1238	1209	1181	1169
24	1157	1163	1185	1212	1229	1217	1192	1169	1162	1179	1205	1232	1241	1230	1199	1169	1157
25	1142	1151	1174	1204	1221	1208	1181	1156	1150	1166	1194	1224	1234	1220	1188	1156	1142
26	1128	1136	1163	1194	1213	1200	1170	1144	1136	1153	1183	1214	1225	1211	1177	1143	1128
27	1113	1123	1151	1185	1203	1190	1159	1130	1120	1139	1172	1205	1216	1201	1165	1129	1113
28	1098	1109	1140	1175	1194	1180	1147	1116	1105	1126	1160	1195	1207	1191	1153	1115	1098
29	1084	1095	1127	1164	1184	1170	1135	1100	1090	1112	1149	1184	1198	1182	1141	1099	1084

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30	1067	1080	1114	1154	1174	1159	1121	1085	1074	1098	1135	1174	1187	1171	1128	1084	1067
31	1051	1065	1102	1143	1165	1148	1109	1071	1058	1082	1122	1164	1177	1161	1115	1069	1051
32	1034	1049	1089	1132	1155	1136	1096	1055	1040	1067	1110	1152	1167	1149	1102	1052	1034
33	1017	1033	1075	1121	1143	1126	1083	1039	1023	1051	1096	1140	1156	1137	1087	1036	1017
34	999	1017	1062	1109	1133	1114	1069	1022	1007	1035	1083	1128	1145	1125	1073	1021	999
35	982	1001	1048	1098	1121	1103	1055	1005	989	1019	1068	1116	1133	1113	1059	1004	982
36	963	985	1034	1086	1111	1091	1040	989	972	1001	1054	1104	1121	1100	1044	986	963
37	945	968	1020	1074	1100	1078	1025	972	952	984	1040	1092	1110	1087	1030	970	945
38	926	950	1005	1061	1087	1066	1010	954	934	967	1025	1078	1098	1075	1015	952	926
39	905	931	991	1048	1075	1053	996	936	915	950	1010	1065	1085	1062	999	935	905
40	890	911	975	1035	1063	1040	981	919	901	932	994	1052	1073	1048	983	916	890
41	870	898	960	1023	1051	1027	964	904	880	911	979	1038	1060	1035	968	904	870
42	852	880	945	1010	1039	1014	948	887	861	896	963	1025	1046	1021	951	883	852
43	831	861	930	996	1026	1000	933	868	841	877	947	1010	1033	1006	934	867	831
44	813	842	913	983	1013	987	917	851	822	859	930	996	1020	993	917	849	813
45	794	825	901	969	1001	973	898	834	803	840	913	983	1005	978	901	831	794
46	774	806	883	955	987	958	887	817	784	822	901	968	992	963	889	813	774
47	755	788	867	942	974	944	868	800	762	803	883	954	978	948	868	795	755
48	736	770	851	927	960	929	852	783	744	785	866	938	964	933	851	778	736
49	716	752	835	911	946	915	835	764	724	767	848	923	950	919	834	760	716
50	696	735	818	902	933	898	818	747	705	747	832	911	933	902	818	743	696
51	677	716	802	886	922	887	801	730	686	729	815	896	923	891	801	725	677
52	657	698	787	872	908	872	785	712	664	711	799	881	909	875	784	708	657
53	636	680	770	857	893	858	769	692	644	693	782	865	893	859	768	689	636
54	617	662	753	843	879	843	753	675	625	674	764	850	878	844	751	671	617
55	598	643	738	828	865	828	736	656	605	654	748	835	865	827	733	653	598
56	576	625	722	814	851	813	720	638	583	637	732	820	849	812	717	632	576
57	557	606	706	799	836	798	705	618	563	618	716	804	835	796	701	614	557
58	535	589	690	785	823	784	689	599	543	601	700	789	820	781	685	595	535
59	515	572	674	770	810	769	673	580	523	582	683	775	806	765	668	576	515
60	495	554	660	757	795	755	657	561	503	562	667	759	791	750	653	558	495
61	476	536	645	742	782	739	643	542	481	545	651	745	777	736	637	537	476

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Report No.: BLC2105009E-A-R

62	454	518	629	727	768	724	628	522	461	527	635	729	762	720	622	518	454
63	434	501	614	712	754	711	613	504	441	508	619	714	747	704	608	501	434
64	414	483	598	698	740	696	599	486	422	490	604	700	733	690	592	481	414
65	395	465	583	683	727	681	585	468	402	472	589	685	719	674	578	464	395
66	376	446	569	669	713	667	570	451	380	454	574	670	705	659	563	446	376
67	356	430	554	656	698	653	557	432	360	437	558	655	691	645	549	429	356
68	336	411	539	641	685	640	541	416	341	418	543	640	676	632	534	411	336
69	315	394	525	626	672	625	527	399	320	401	528	625	663	617	519	394	315
70	296	377	510	612	659	612	512	383	300	384	514	612	649	602	504	376	296
71	276	361	498	599	645	599	498	365	281	368	499	597	635	589	489	359	276
72	258	346	484	585	632	585	483	349	261	352	485	583	622	576	475	344	258
73	238	330	470	572	618	571	469	334	242	335	472	569	608	562	462	328	238
74	219	315	456	558	605	558	455	320	222	320	458	554	595	548	446	313	219
75	201	300	444	545	592	546	441	304	204	305	444	541	581	535	432	298	201
76	182	286	430	531	579	533	427	290	185	290	431	528	569	523	420	283	182
77	166	272	418	519	567	520	414	276	168	276	418	515	555	508	406	270	166
78	148	258	405	506	554	506	401	262	149	260	405	502	543	496	393	256	148
79	130	246	393	493	542	494	389	249	133	248	393	488	531	482	380	242	130
80	115	233	379	480	530	482	377	235	117	236	379	476	517	470	368	229	115
81	99	220	366	468	518	468	364	222	102	222	367	463	506	458	357	216	99
82	84	209	355	455	505	456	353	211	85	210	355	451	494	446	345	204	84
83	72	198	344	444	493	444	342	199	72	199	344	439	481	432	333	193	72
84	60	186	332	431	482	432	331	187	60	188	331	426	470	420	322	181	60
85	47	176	321	420	470	421	319	176	47	177	320	414	458	408	312	171	47
86	38	165	310	408	459	408	309	166	38	167	309	403	447	397	300	161	38
87	30	156	298	397	447	398	298	157	29	157	298	392	435	385	289	152	30
88	24	147	289	387	437	387	288	147	23	148	288	381	424	375	278	142	24
89	21	139	279	377	426	376	278	139	19	140	278	371	414	364	268	134	21
90	19	131	271	368	415	365	268	131	16	131	269	361	403	354	259	126	19
91	19	125	262	358	404	355	259	124	16	124	260	352	393	345	250	120	19
92	19	119	255	350	393	346	250	118	16	118	253	341	382	335	242	113	19
93	18	113	248	340	383	336	242	112	17	112	245	332	372	325	235	107	18

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Unit 401, No. 309 Xinxin Seven Road, Zengcheng District,

Guangzhou, People's Republic of China engineer@etk-utest.com

Report Format Number BL-FM-SA-012



Report No.: BLC2105009E-A-R

Certificate#4810.01

94	19	107	240	332	374	327	234	107	16	106	238	324	361	317	228	102	19
95	19	103	234	323	363	318	227	102	16	101	230	315	352	308	221	98	19
96	19	98	225	315	354	310	220	97	16	97	222	306	343	301	215	93	19
97	18	94	218	307	344	302	213	92	16	93	215	298	333	293	208	89	18
98	18	89	211	299	335	292	206	88	16	88	208	290	324	284	201	85	18
99	19	85	204	291	325	284	200	84	16	84	201	282	314	277	195	80	19
100	18	81	198	283	316	277	194	81	15	79	194	274	306	270	189	76	18
101	18	78	191	275	308	269	188	77	15	76	188	267	298	263	182	73	18
102	17	76	185	268	299	261	181	74	15	73	182	260	289	256	176	70	17
103	17	72	179	260	290	253	175	71	15	70	177	252	280	249	170	67	17
104	17	69	173	253	282	246	170	68	15	67	170	244	272	242	164	65	17
105	17	67	167	245	274	239	164	65	15	64	165	238	264	235	158	62	17
106	18	64	162	237	266	232	159	63	15	62	159	231	256	228	152	60	18
107	17	62	157	230	258	225	153	60	14	59	154	224	249	221	148	58	17
108	17	59	152	224	250	219	148	58	15	57	149	217	241	215	142	55	17
109	16	57	147	216	243	212	143	56	14	55	143	210	233	208	137	53	16
110	17	55	143	209	235	205	138	54	15	53	138	204	226	201	132	51	17
111	16	53	138	203	228	199	134	52	14	50	133	197	220	195	127	48	16
112	16	51	133	196	222	193	129	51	14	47	128	191	213	188	123	46	16
113	16	49	129	190	215	187	125	49	14	45	124	184	205	182	119	45	16
114	16	47	125	184	208	181	120	46	14	43	120	179	199	176	115	43	16
115	16	45	120	179	201	175	116	44	13	43	116	172	193	170	112	42	16
116	16	43	116	173	195	170	112	42	13	42	112	167	187	165	107	41	16
117	16	42	111	167	188	164	107	41	14	41	106	161	180	159	102	40	16
118	16	40	104	162	183	159	101	39	13	39	100	156	174	154	96	39	16
119	15	39	98	157	177	153	95	38	13	39	95	151	168	149	91	37	15
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121	15	36	89	146	165	143	87	36	13	35	87	142	157	140	84	34	15
122	15	34	86	141	159	138	84	35	13	34	85	137	152	135	81	33	15
123	14	33	83	136	154	133	82	33	13	33	82	131	147	129	79	33	14
124	14	32	81	130	150	126	79	33	13	33	79	125	142	122	76	32	14
125	14	32	78	122	143	120	76	32	13	32	76	119	136	117	73	31	14

Laboratory: Belling Test Laboratory Co., LTD A2LA Certificate# 4810.01

Unit 401, No. 309 Xinxin Seven Road, Zengcheng District,

Guangzhou, People's Republic of China engineer@etk-utest.com

Report Format Number BL-FM-SA-012

12 / 20



Report No.: BLC2105009E-A-R

Certificate#4810.01

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129	14	29	70	104	119	102	67	28	13	29	64	102	115	100	63	28	14
130	14	29	68	100	115	98	66	28	13	28	63	98	111	96	62	28	14
131	14	28	65	97	111	94	63	27	13	28	62	94	107	92	60	27	14
132	14	28	63	93	107	91	61	27	13	27	61	90	103	89	59	27	14
133	13	27	62	90	102	87	59	26	13	27	59	87	99	85	57	26	13
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137	13	25	54	78	88	76	51	24	12	25	51	74	83	74	49	24	13
138	12	25	51	75	86	74	49	24	12	24	49	73	80	72	47	24	12
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148	11	22	36	48	56	48	33	20	11	19	34	48	55	46	32	18	11
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151	12	22	34	42	47	41	30	19	11	18	31	42	46	39	27	15	12
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157	13	20	28	32	35	31	25	17	11	15	23	32	35	29	20	13	13

Laboratory: Belling Test Laboratory Co., LTD A2LA Certificate# 4810.01

Unit 401, No. 309 Xinxin Seven Road, Zengcheng District,

Guangzhou, People's Republic of China engineer@etk-utest.com

Report Format Number BL-FM-SA-012



Report No.: BLC2105009E-A-R

Certificate#4810.01

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Laboratory: Belling Test Laboratory Co., LTD A2LA Certificate# 4810.01

Unit 401, No. 309 Xinxin Seven Road, Zengcheng District,  
Guangzhou, People' s Republic of China engineer@etk-utest.com

Report Format Number BL-FM-SA-012





Report No.: BLC2105009E-A-R

## UGR

### UGR Table - Corrected

#### Reflectances

Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20

Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H Y=2H		16.8	18.2	17.4	18.8	19.4	20.2	21.6	20.7	22.1	22.8
	3H	18.2	19.5	18.8	20.1	20.7	22.8	24.2	23.4	24.7	25.4
	4H	18.6	19.9	19.2	20.4	21.1	24.2	25.4	24.8	26.0	26.7
	6H	18.9	20.0	19.5	20.6	21.3	25.6	26.8	26.2	27.4	28.1
	8H	18.9	20.0	19.5	20.7	21.3	26.4	27.5	27.0	28.1	28.8
	12H	18.9	20.0	19.6	20.6	21.3	27.2	28.3	27.8	28.9	29.6
4H	2H	17.9	19.1	18.5	19.7	20.4	20.5	21.7	21.1	22.3	23.0
	3H	19.5	20.6	20.1	21.2	21.9	23.4	24.5	24.0	25.1	25.8
	4H	20.1	21.1	20.7	21.7	22.4	24.9	25.9	25.5	26.5	27.2
	6H	20.5	21.4	21.1	22.0	22.7	26.5	27.4	27.2	28.1	28.8
	8H	20.6	21.4	21.2	22.1	22.8	27.4	28.2	28.0	28.9	29.6
	12H	20.7	21.4	21.3	22.1	22.8	28.4	29.1	29.0	29.8	30.5
8H	4H	21.0	21.8	21.7	22.5	23.2	25.1	25.9	25.7	26.6	27.3
	6H	21.6	22.3	22.3	23.0	23.8	26.9	27.6	27.5	28.3	29.0
	8H	21.8	22.5	22.5	23.2	23.9	27.9	28.5	28.6	29.2	30.0
	12H	22.0	22.5	22.7	23.2	24.0	29.0	29.6	29.7	30.2	31.1
12H	4H	21.3	22.0	21.9	22.7	23.5	25.1	25.8	25.7	26.5	27.3
	6H	22.0	22.7	22.7	23.3	24.1	26.9	27.5	27.6	28.2	29.0
	8H	22.3	22.9	23.0	23.6	24.4	27.9	28.5	28.6	29.2	30.0

Maximum UGR = 31.1



Report No.: BLC2105009E-A-R

**2.2 Electrical, Photometric and Chromaticity Measurements***(Refer to Work Instruction BL-QP-033)*

<b>Test date</b>	2021-05-20	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	IK-LLB04-40W-30/40/50K-MV-WH (40W,65K)		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC210500	120.0	60	0.323	38.66	0.997	6.83
9E-A2	277.0	60	0.140	37.33	0.966	8.77
<b>DLC Pass Criteria</b>					$\geq 0.9(-3\%)$	$\leq 20(+5)$

**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	9
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	6597	R3	94	R11	79
Duv	0.0067	R4	80	R12	55
Chromaticity (x, y)	x=0.3103 y=0.3336	R5	82	R13	85
Chromaticity (u', v')	u(u')=0.1945 v'=0.4704	R6	86	R14	97
Color Rendering Index (CRI)	84	R7	87	R15	77
R9	9	R8	69	--	--
Rf	83				
Rg	91				
Rcs,h1 (%)	-13	--	--	--	--

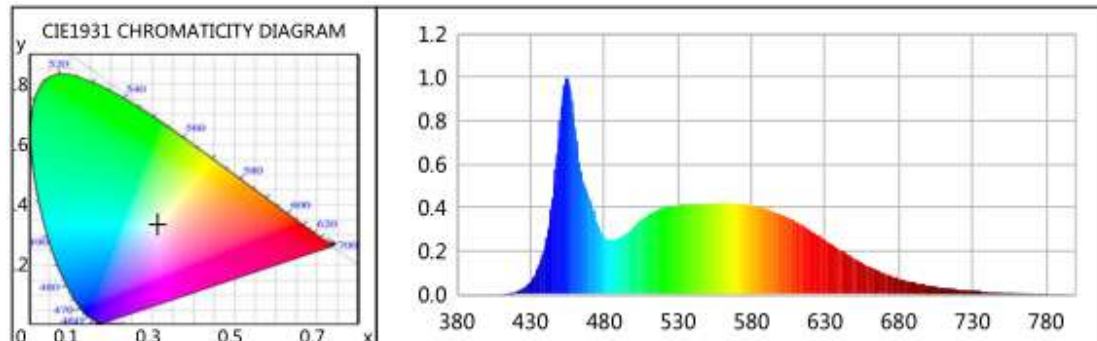
**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	5400.8	5187.8	5000-10000lm (-10%)
Luminous Efficacy (lm/W)	139.70	138.97	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	134.19		



Report No.: BLC2105009E-A-R

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0362	525	0.4065	79.0844	670	0.0980	19.0599
385	0.0005	0.0917	530	0.4094	79.6630	675	0.0840	16.3356
390	0.0001	0.0223	535	0.4135	80.4510	680	0.0732	14.2401
395	0.0004	0.0806	540	0.4155	80.8487	685	0.0632	12.3041
400	0.0006	0.1092	545	0.4165	81.0363	690	0.0549	10.6798
405	0.0006	0.1134	550	0.4171	81.1543	695	0.0465	9.0551
410	0.0014	0.2807	555	0.4205	81.8086	700	0.0404	7.8638
415	0.0051	1.0012	560	0.4204	81.7980	705	0.0346	6.7383
420	0.0127	2.4785	565	0.4204	81.8012	710	0.0296	5.7659
425	0.0292	5.6857	570	0.4185	81.4284	715	0.0249	4.8449
430	0.0613	11.9237	575	0.4159	80.9208	720	0.0222	4.3265
435	0.1227	23.8807	580	0.4104	79.8453	725	0.0185	3.5923
440	0.2354	45.8105	585	0.4027	78.3615	730	0.0155	3.0207
445	0.4471	86.9937	590	0.3946	76.7871	735	0.0135	2.6311
450	0.8003	155.7198	595	0.3827	74.4714	740	0.0121	2.3542
455	1.0000	194.5728	600	0.3690	71.7993	745	0.0109	2.1282
460	0.7748	150.7533	605	0.3535	68.7829	750	0.0091	1.7760
465	0.5406	105.1850	610	0.3361	65.3950	755	0.0079	1.5382
470	0.4404	85.6882	615	0.3177	61.8094	760	0.0057	1.1159
475	0.3364	65.4625	620	0.2962	57.6414	765	0.0060	1.1636
480	0.2627	51.1107	625	0.2735	53.2209	770	0.0055	1.0656
485	0.2497	48.5846	630	0.2507	48.7786	775	0.0038	0.7471
490	0.2597	50.5209	635	0.2282	44.3981	780	0.0032	0.6130
495	0.2807	54.6248	640	0.2064	40.1528	785	0.0023	0.4436
500	0.3108	60.4806	645	0.1844	35.8880	790	0.0026	0.5091
505	0.3426	66.6676	650	0.1644	31.9792	795	0.0011	0.2220
510	0.3693	71.8470	655	0.1456	28.3351	800	0.0016	0.3185
515	0.3863	75.1598	660	0.1287	25.0418			
520	0.3995	77.7413	665	0.1126	21.9166			

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Report Format Number BL-FM-SA-012



Report No.: BLC2105009E-A-R

## TM30

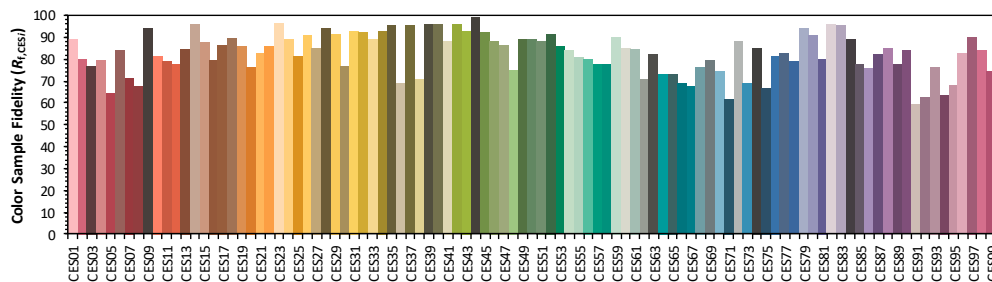
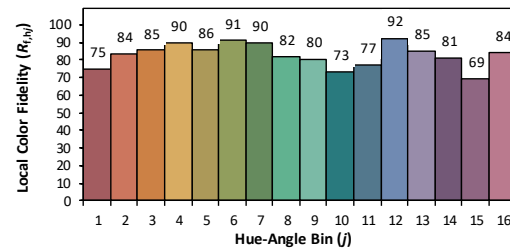
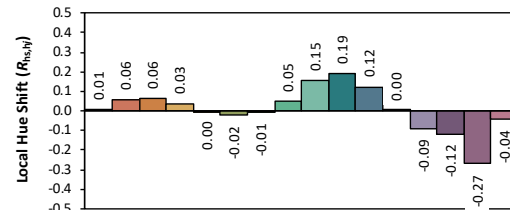
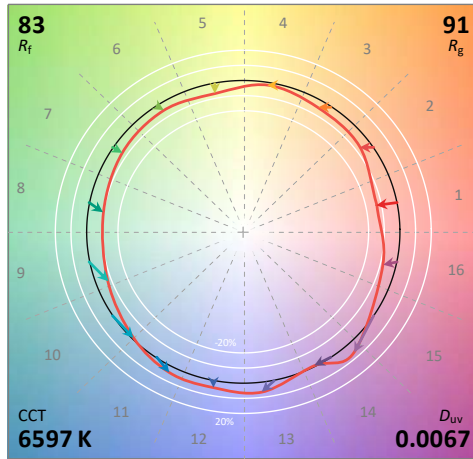
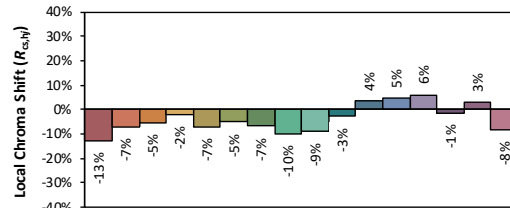
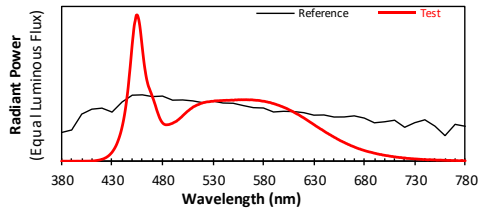
### ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35002U1

Manufacturer: IKIO LED LIGHTING

Date: 2021/5/20

Model: IK-LLB04-40W-30/40/50K-MV-WH (40W, 6500K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3103  
 $y$  0.3336  
 $u'$  0.1945  
 $v'$  0.4704

CIE 13.3-1995  
(CRI)

$R_a$  84  
 $R_9$  9

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

Laboratory: Belling Test Laboratory Co., LTD A2LA Certificate# 4810.01

Unit 401, No. 309 Xinxin Seven Road, Zengcheng District,  
Guangzhou, People's Republic of China engineer@etk-utest.com

Report Format Number BL-FM-SA-012



Report No.: BLC2105009E-A-R

### Calculated Efficacy Data for family models:

Model Number	Luminous Flux (lm)	Power (W)	Efficacy (lm/W)
AST-LA01C-40W4FTBTB1A3-abc30	5036.6	38.33	131.40
AST-LA01C-40W4FTBTB1A3-abc35	5088.6	38.50	132.19
AST-LA01C-40W4FTBTB1A3-abc40	5140.7	38.50	133.54
AST-LA01C-40W4FTBTB1A3-abc45	5185.3	38.50	134.70
AST-LA01C-40W4FTBTB1A3-abc50	5229.8	38.50	135.86
AST-LA01C-40W4FTBTB1A3-abc57	5274.4	38.50	137.02
AST-LA01C-40W4FTBTB1A3-abc65	5400.8	38.66	139.70

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

$$5088.6 = ( 5400.8 - 5036.6 ) / 7 + 5036.6$$

$$5140.7 = ( 5400.8 - 5036.6 ) / 7 + 5088.6$$

$$5185.3 = ( 5400.8 - 5036.6 ) / 7 + 5140.7$$

$$5229.8 = ( 5400.8 - 5036.6 ) / 7 + 5185.3$$

$$5274.4 = ( 5400.8 - 5036.6 ) / 7 + 5229.8$$

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

$$38.50 = ( 38.66 + 38.33 ) / 2$$

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

$$132.19 = 5088.6 / 38.50$$

$$133.54 = 5140.7 / 38.50$$

$$134.70 = 5185.3 / 38.50$$

$$135.86 = 5229.8 / 38.50$$

$$137.02 = 5274.4 / 38.50$$



Report No.: BLC2105009E-A-R

### 3. Test Equipment

Equipment Name	Model No.	Serial No.	Next Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2022-01-18
AC Power Source	CHP-500	DYBWD010159	2022-01-25
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2022-01-24
Digital Power Meter	WT500	DYDWQ20010	2022-01-25
Integral Sphere (2M)	2M	DYJCE120067	2022-01-18
Digital Power Meter	WT500	DYDWQ20006	2022-01-25
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2022-01-18
Expand Uncertainty: Photometric Measurement (Sphere): 2.08%, k=2 Chromaticity Measurement(Sphere):25.6K, k=2 Photometric Measurement(Goniophotometer):2.645%, k=2			

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