

LM-79-08 Test Report

For

IKIO LED LIGHTING**(Brand Name: IKIO)**8470 Allison Pointe Blvd, Suite 128
Indianapolis, IN 46250**Replacement Lamps for High-Bay Luminaires for
Commercial and Industrial Buildings (Type B)**

Model name(s): IK-HBKT-L120-0120-XX

Representative (Tested) Model: IK-HBKT-L120-0120-27
IK-HBKT-L120-0120-57

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

Test & Report By:

Bill Luo

Engineer: Bill Luo

Date: May.23,2017

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

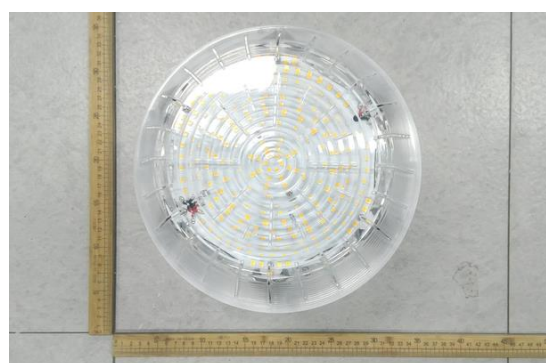
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1.1 Product Information:

Organization Name	IKIO LED LIGHTING	
Brand Name	IKIO	
Model Number	IK-HBKT-L120-0120-XX	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Replacement Lamps for High-Bay Luminaires for Commercial and Industrial Buildings (Type B)	
Rated Voltage / Frequency	100 -277Vac, 60 Hz	
Nominal Power	120W	
Rated Initial Lamp Lumen	--	
Declared CCT	2700K,3000K,3500K,4000K,4500K,5700K	
LED Manufacturer	Samsung Electronics Co., LTD.	
LED Model	SPMWH1228xxxxxxxxxx	
Sample Number	GZE1705163-B1(2700K), B2(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	May.16,2017
Date of Test	May.19,2017
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

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° vertical intervals and 22.5° 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.

2.1 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction QD25)

Test date	2017-05-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-HBKT-L120-0120-27		

Electrical Measurement in Lithonia THD 400S A15:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170516	120.0	60	0.9746	116.3	0.9944	6.49
3-B1	277.0	60	0.4372	113.9	0.9405	13.66
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

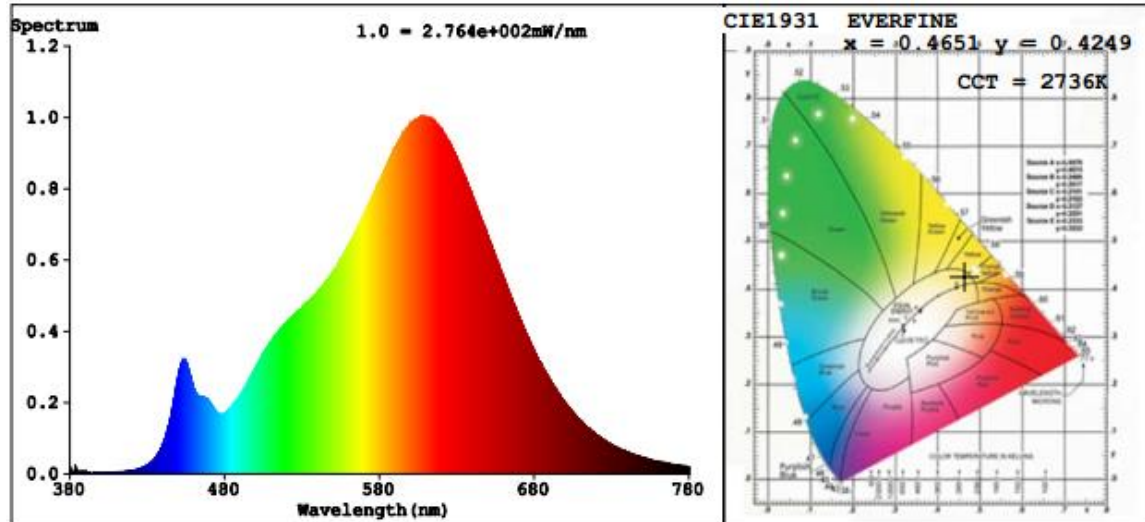
Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	16
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	2736	R3	98	R11	82
Duv	0.0047	R4	82	R12	72
Chromaticity (x, y)	x=0.4651 y=0.4249	R5	82	R13	85
Chromaticity (u', v')	u'=0.2596 v'=0.5334	R6	91	R14	99
Color Rendering Index (CRI)	84.3	R7	85	R15	74
R9	16	R8	62	--	--

Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15:

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	12239	12049	>=10000(-10%)	
Luminous Efficacy (lm/W)	105.24	105.79	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	103.60		105(-3%)	130(-3%)
Zonal lumens in the 20-50 °zone (%)	57.1	--	>= 30%(-10%)	
Beam Angle (°)	115.0	--	--	
Center Beam Candle Power (cd)	4127	--	--	

Spectral Power Distribution & Chromaticity Diagram

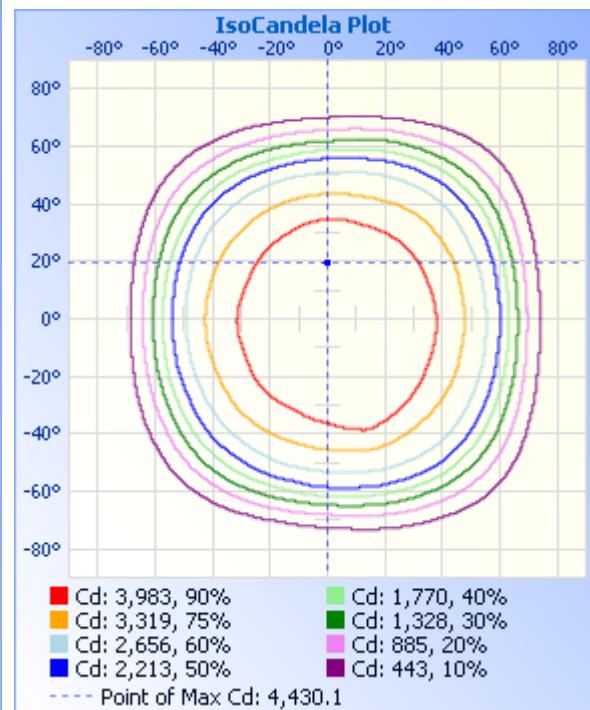
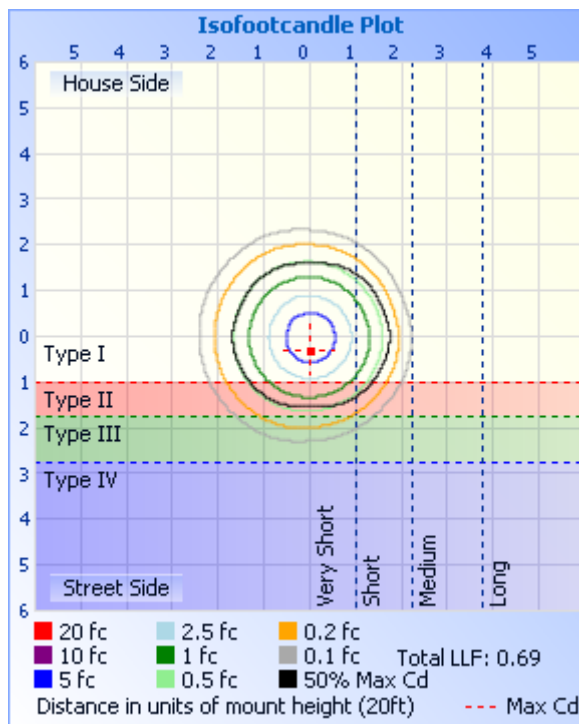
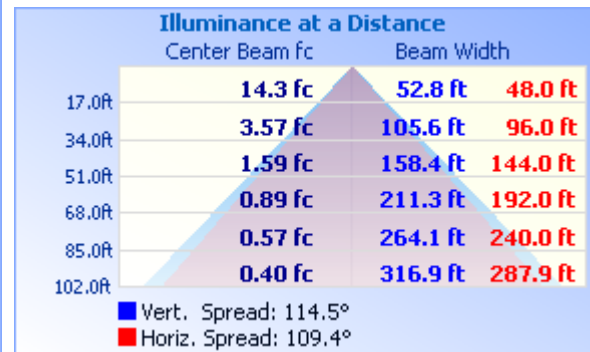
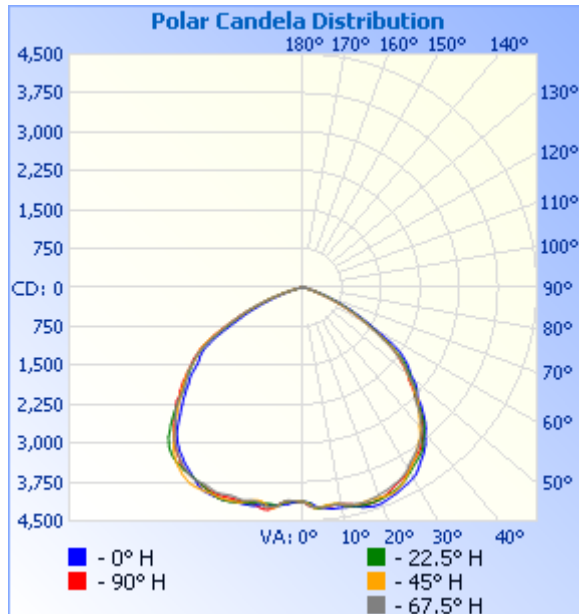


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,607.4	29.5%
0-40	6,094.2	49.8%
0-60	10,740.3	87.8%
60-90	1,480.0	12.1%
70-100	341.0	2.8%
90-120	5.5	0%
0-90	12,220.3	99.9%
90-180	17.3	0.1%
0-180	12,237.6	100%

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-10	403.4	3.3%	90-100	2.2	0%
10-20	1,220.1	10.0%	100-110	1.4	0%
20-30	1,983.9	16.2%	110-120	2.0	0%
30-40	2,486.8	20.3%	120-130	2.6	0%
40-50	2,526.5	20.6%	130-140	2.8	0%
50-60	2,119.6	17.3%	140-150	2.6	0%
60-70	1,141.2	9.3%	150-160	2.0	0%
70-80	286.3	2.3%	160-170	1.3	0%
80-90	52.5	0.4%	170-180	0.4	0%

Photometric Data



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	4127	4127	4127	4127	4127	4127	4127	4127	4127	4127	4127	4127	4127	4127	4127	4127	4127
1	4138	4142	4158	4175	4185	4119	4131	4124	4134	4123	4123	4129	4136	4090	4114	4124	4138
2	4158	4170	4200	4226	4228	4171	4159	4131	4135	4121	4112	4121	4129	4090	4119	4127	4158
3	4208	4251	4248	4232	4238	4201	4212	4170	4154	4123	4110	4111	4124	4103	4135	4166	4208
4	4254	4270	4245	4242	4247	4207	4224	4208	4185	4138	4126	4111	4139	4112	4156	4215	4254
5	4257	4246	4235	4261	4248	4198	4232	4219	4195	4162	4139	4134	4149	4131	4190	4250	4257
6	4272	4228	4222	4257	4251	4194	4244	4245	4219	4212	4192	4179	4181	4164	4264	4276	4272
7	4299	4219	4212	4242	4245	4197	4219	4273	4229	4238	4262	4245	4251	4242	4284	4280	4299
8	4305	4218	4211	4229	4233	4186	4208	4254	4237	4217	4288	4259	4301	4269	4284	4273	4305
9	4298	4226	4219	4229	4231	4178	4199	4244	4233	4221	4269	4286	4331	4278	4292	4279	4298
10	4301	4251	4247	4233	4240	4180	4208	4252	4247	4225	4230	4296	4341	4271	4308	4282	4301
11	4309	4285	4276	4249	4252	4188	4222	4275	4270	4233	4200	4252	4323	4259	4321	4290	4309
12	4319	4302	4292	4267	4270	4196	4228	4290	4291	4243	4191	4222	4299	4250	4322	4308	4319
13	4330	4317	4301	4284	4290	4201	4233	4306	4312	4263	4205	4212	4276	4246	4325	4336	4330
14	4348	4333	4311	4292	4311	4199	4243	4322	4319	4286	4234	4222	4258	4244	4323	4372	4348
15	4379	4347	4303	4305	4326	4196	4252	4340	4325	4295	4266	4246	4269	4254	4318	4394	4379
16	4399	4358	4293	4305	4340	4199	4277	4362	4327	4306	4302	4257	4286	4274	4317	4400	4399
17	4419	4355	4287	4297	4354	4203	4312	4383	4330	4328	4323	4252	4287	4284	4335	4405	4419
18	4427	4351	4291	4276	4356	4211	4334	4397	4336	4345	4333	4244	4289	4290	4356	4414	4427
19	4430	4349	4297	4272	4351	4224	4357	4405	4350	4361	4340	4242	4291	4294	4373	4408	4430
20	4422	4343	4304	4255	4336	4245	4371	4405	4369	4372	4348	4249	4302	4301	4386	4394	4422
21	4408	4335	4314	4241	4315	4259	4372	4401	4372	4375	4355	4266	4308	4302	4396	4384	4408
22	4394	4320	4321	4223	4294	4265	4368	4395	4365	4372	4357	4283	4313	4305	4398	4370	4394
23	4372	4306	4327	4210	4261	4269	4355	4390	4368	4356	4349	4284	4315	4308	4395	4365	4372
24	4360	4295	4316	4188	4234	4261	4333	4378	4370	4338	4348	4273	4308	4319	4394	4358	4360
25	4341	4277	4294	4173	4204	4240	4312	4357	4364	4316	4351	4256	4305	4338	4388	4352	4341
26	4319	4254	4267	4159	4181	4210	4284	4336	4362	4295	4357	4242	4294	4352	4378	4345	4319
27	4296	4222	4234	4133	4162	4173	4259	4306	4343	4279	4359	4238	4279	4363	4363	4318	4296
28	4280	4194	4176	4104	4137	4139	4232	4263	4311	4254	4363	4244	4265	4362	4333	4287	4280
29	4262	4148	4130	4072	4108	4096	4189	4226	4259	4238	4362	4244	4244	4344	4307	4248	4262

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30	4233	4115	4076	4031	4062	4058	4149	4170	4224	4225	4358	4239	4230	4322	4277	4211	4233
31	4208	4071	4033	3971	4021	3994	4083	4119	4185	4213	4333	4221	4218	4296	4241	4170	4208
32	4157	4032	3981	3928	3975	3945	4028	4049	4149	4205	4309	4190	4202	4251	4210	4133	4157
33	4102	3999	3941	3895	3943	3893	3963	3994	4108	4198	4278	4167	4184	4211	4155	4096	4102
34	4043	3965	3891	3853	3915	3836	3914	3943	4077	4182	4235	4138	4151	4151	4109	4041	4043
35	3997	3935	3820	3816	3876	3785	3859	3901	4026	4167	4200	4093	4113	4097	4044	3994	3997
36	3947	3890	3758	3781	3838	3739	3817	3878	3984	4148	4153	4051	4058	4031	3995	3921	3947
37	3884	3835	3706	3723	3782	3703	3720	3837	3945	4125	4104	4003	4019	3952	3948	3862	3884
38	3826	3754	3662	3675	3722	3631	3671	3782	3893	4099	4029	3958	3967	3890	3899	3804	3826
39	3737	3686	3578	3615	3653	3553	3601	3699	3842	4056	3965	3901	3920	3812	3830	3727	3737
40	3657	3621	3484	3562	3585	3495	3546	3646	3771	4015	3873	3850	3856	3761	3765	3664	3657
41	3596	3541	3428	3459	3507	3425	3502	3569	3709	3944	3781	3767	3794	3696	3698	3595	3596
42	3508	3464	3343	3384	3420	3338	3421	3499	3610	3874	3688	3675	3705	3640	3649	3520	3508
43	3418	3332	3273	3278	3328	3271	3343	3385	3513	3753	3614	3600	3639	3567	3609	3436	3418
44	3310	3231	3193	3171	3203	3160	3215	3294	3405	3668	3516	3534	3566	3511	3557	3363	3310
45	3214	3103	3125	3063	3104	3057	3132	3163	3328	3554	3436	3473	3489	3479	3475	3289	3214
46	3077	3005	3052	3014	2988	2973	3028	3075	3225	3442	3347	3418	3408	3418	3361	3149	3077
47	2997	2957	2935	2980	2909	2873	2939	2966	3155	3316	3278	3328	3350	3327	3249	3031	2997
48	2947	2905	2834	2873	2797	2793	2804	2892	3051	3195	3185	3226	3276	3229	3172	2964	2947
49	2884	2808	2729	2756	2705	2693	2752	2807	2977	3083	3117	3083	3149	3139	3080	2940	2884
50	2792	2694	2647	2658	2636	2570	2641	2760	2871	2997	3042	2994	3088	3055	2979	2879	2792
51	2664	2634	2553	2575	2549	2478	2564	2705	2813	2940	2967	2896	3010	2947	2903	2789	2664
52	2597	2535	2482	2497	2463	2371	2479	2641	2740	2865	2883	2837	2929	2851	2803	2731	2597
53	2534	2464	2385	2383	2353	2299	2402	2555	2622	2761	2804	2780	2818	2747	2726	2639	2534
54	2463	2368	2305	2279	2279	2218	2325	2493	2525	2687	2747	2733	2753	2668	2643	2573	2463
55	2365	2248	2178	2141	2176	2129	2219	2389	2445	2607	2630	2643	2644	2554	2580	2487	2365
56	2276	2102	2086	2018	2025	2024	2117	2282	2400	2543	2527	2559	2580	2466	2484	2380	2276
57	2148	1959	1892	1823	1905	1861	1961	2205	2334	2452	2448	2464	2507	2395	2399	2296	2148
58	1991	1761	1739	1699	1750	1726	1848	2036	2255	2358	2377	2378	2401	2324	2299	2182	1991
59	1770	1639	1583	1567	1630	1569	1739	1899	2118	2264	2305	2260	2318	2222	2163	2040	1770
60	1605	1503	1443	1469	1489	1431	1603	1747	1993	2128	2197	2127	2202	2127	2013	1880	1605
61	1480	1393	1328	1346	1376	1312	1501	1605	1815	1992	2063	1998	2047	1957	1891	1747	1480

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62	1336	1266	1191	1240	1217	1167	1364	1495	1635	1804	1918	1834	1927	1832	1720	1590	1336
63	1232	1138	1081	1113	1096	1056	1215	1348	1479	1654	1726	1715	1752	1658	1553	1486	1232
64	1101	1042	958	996	966	932	1093	1240	1333	1520	1593	1575	1601	1528	1430	1348	1101
65	1004	908	861	868	866	811	950	1092	1228	1390	1425	1449	1447	1384	1282	1239	1004
66	874	812	737	765	740	715	844	967	1089	1278	1290	1337	1322	1245	1166	1080	874
67	781	702	645	643	638	604	727	869	964	1140	1182	1202	1174	1133	1022	960	781
68	671	612	533	527	526	523	604	741	866	1034	1045	1091	1023	982	917	830	671
69	586	504	454	450	453	424	515	639	745	905	936	949	913	874	793	732	586
70	486	424	367	370	377	364	428	517	653	783	806	830	796	749	695	610	486
71	406	343	306	307	306	290	373	424	542	701	709	730	689	656	574	497	406
72	328	285	242	252	251	239	302	367	462	598	599	608	599	539	483	429	328
73	273	229	195	211	195	201	251	300	379	512	498	516	486	461	398	356	273
74	218	185	160	169	171	170	209	257	310	416	424	422	413	378	344	301	218
75	171	138	137	151	150	150	180	201	258	338	338	348	341	319	280	249	171
76	145	120	123	132	134	135	162	171	209	281	270	284	276	249	242	205	145
77	127	107	107	118	117	119	142	154	164	223	223	232	225	214	196	169	127
78	114	93	95	103	102	104	124	135	145	166	179	190	180	174	169	152	114
79	99	83	82	89	91	92	112	118	127	144	149	152	158	150	151	133	99
80	88	71	70	77	77	78	96	105	111	126	129	132	137	135	132	115	88
81	76	62	60	64	66	68	81	91	99	112	112	118	119	118	117	103	76
82	63	51	49	54	53	55	70	79	85	97	100	103	106	106	102	88	63
83	54	41	41	42	44	43	56	65	74	83	88	89	92	91	90	77	54
84	44	34	31	31	32	34	44	53	61	72	75	79	79	80	75	63	44
85	36	25	23	22	22	24	34	44	50	59	63	66	68	67	62	53	36
86	27	18	13	11	13	12	23	33	42	48	53	56	56	55	52	42	27
87	19	9	3	3	3	4	13	22	31	40	42	45	46	46	40	30	19
88	9	3	2	2	2	3	4	13	21	30	33	35	35	35	31	21	9
89	2	2	2	2	1	2	3	4	12	22	25	27	25	27	20	10	2
90	2	2	1	1	1	2	2	3	4	11	15	18	17	17	11	3	2
91	2	1	1	1	1	2	2	2	3	4	8	8	8	7	2	2	2
92	2	1	1	1	1	2	2	2	2	3	3	3	3	2	2	2	2
93	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	1

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94	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1
95	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1
96	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1
97	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1
98	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1
99	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1
100	1	1	1	1	1	2	2	2	1	2	1	1	1	1	1	1	1
101	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1
102	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1
103	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1
104	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1
105	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1
106	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1
107	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1
108	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1
109	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1
110	1	1	1	2	1	2	2	2	2	2	1	2	2	1	1	1	1
111	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2
112	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2
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120	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	3	2
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124	3	3	3	3	2	3	4	3	3	2	3	3	2	2	3	3	3
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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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126	3	3	3	3	3	3	4	4	3	3	3	3	3	3	3	3	3
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156	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
157	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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158	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5
159	4	4	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4
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179	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
180	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

2.2 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction QD25)

Test date	2017-05-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-HBKT-L120-0120-57		

Electrical Measurement in Lithonia THD 400S A15:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170516 3-B2	120.0	60	0.9806	117.1	0.9951	6.88
	277.0	60	0.4410	115.1	0.9422	13.15
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

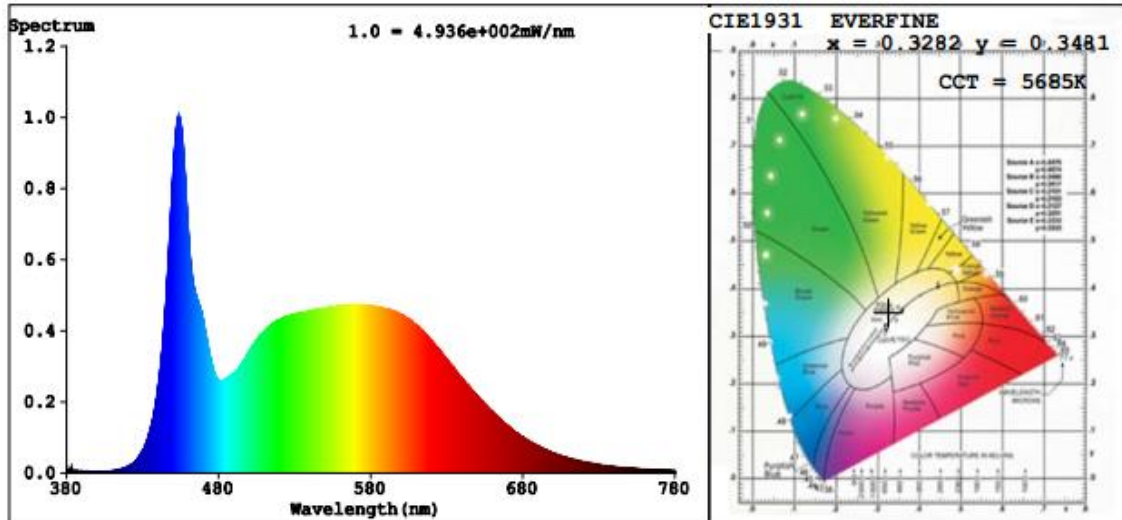
Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	15
Frequency (Hz)	60	R2	91	R10	79
CCT (K)	5685	R3	95	R11	82
Duv	0.0055	R4	83	R12	59
Chromaticity (x, y)	x=0.3282 y=0.3481	R5	84	R13	86
Chromaticity (u', v')	u'=0.201 v'=0.4804	R6	87	R14	98
Color Rendering Index (CRI)	85.1	R7	88	R15	78
R9	15	R8	70	--	--

Photometric Measurement – Sphere-Spectroradiometer Method in Lithonia THD 400S A15:

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	14100	13914	>=10000(-10%)	
Luminous Efficacy (lm/W)	120.41	120.89	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	118.82		105(-3%)	130(-3%)

Spectral Power Distribution & Chromaticity Diagram



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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2.3 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
IK-HBKT-L120-0120-27	2700K	12239	116.3	105.24
IK-HBKT-L120-0120-30	3000K	12549 ^{*1}	116.7 ^{*2}	107.53 ^{*3}
IK-HBKT-L120-0120-35	3500K	12859 ^{*1}	116.7 ^{*2}	110.19 ^{*3}
IK-HBKT-L120-0120-40	4000K	13169 ^{*1}	116.7 ^{*2}	112.84 ^{*3}
IK-HBKT-L120-0120-45	4500K	13479 ^{*1}	116.7 ^{*2}	115.50 ^{*3}
IK-HBKT-L120-0120-50	5000K	13789 ^{*1}	116.7 ^{*2}	118.16 ^{*3}
IK-HBKT-L120-0120-57	5700K	14100	117.1	120.41

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

$$12549 = (14100 - 12239) / 6 + 12239$$

$$12859 = (14100 - 12239) / 6 + 12549$$

$$13169 = (14100 - 12239) / 6 + 12859$$

$$13479 = (14100 - 12239) / 6 + 13169$$

$$13789 = (14100 - 12239) / 6 + 13479$$

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

$$116.7 = (116.3 + 117.1) / 2$$

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

$$107.53 = 12549 / 116.7$$

$$110.19 = 12859 / 116.7$$

$$112.84 = 13169 / 116.7$$

$$115.50 = 13479 / 116.7$$

$$118.16 = 13789 / 116.7$$

Laboratory: Standard-Tech Co. Ltd Testing Center

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-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 *******