

LM-79-08 Test Report

For

IKIO LED LIGHTING

(Brand Name: IKIO)

8470 Allison Pointe Blvd, Suite 128 Indianapolis, IN 46250

High-Bay Luminaires (Commercial and Industrial)

Model name(s):

IK-UFHB-240W-354050K-BL (200W)

Representative (Tested) Model:

IK-UFHB-240W-354050K-BL (200W,35K) 35WD

IK-UFHB-240W-354050K-BL (200W,40K) 40WD

IK-UFHB-240W-354050K-BL (200W,50K) 50WD

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

Test & Report By:



Engineer: Candy Chen

Date: 2022-09-29

Review By:

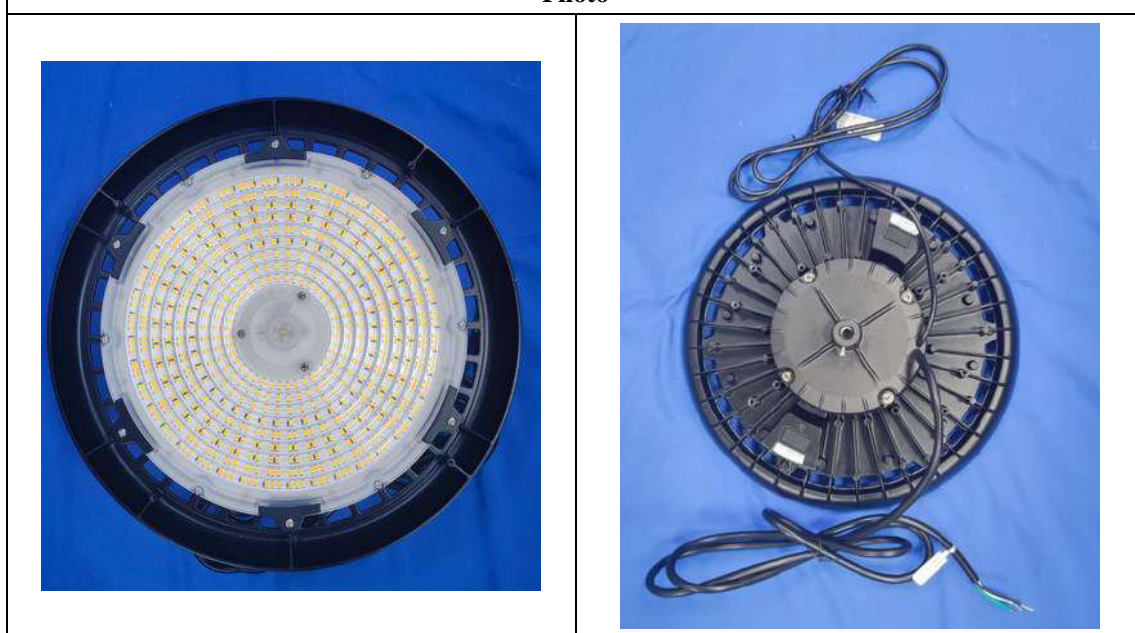


Manager: Jason Luo

1.1 Product Information:

Organization Name	IKIO LED LIGHTING	
Brand Name	IKIO	
Model Number	IK-UFHB-240W-354050K-BL (200W)	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	High-Bay Luminaires (Commercial and Industrial)	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	200W(Power adjustable)	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K,4000K, 4500K(Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-XX80RA35000H1	
Sample Number	BLC2209005E-C1	
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	2022-09-25
Date of Test	2022-09-27
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-79-2017 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	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° vertical intervals and 22.5° horizontal intervals. Goniophotometer far field detector $f1'=1.42\%$, Test distance: 14.14m

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.

Self-absorption:

AST-HB18B-200WL1B1T2A1-abc35WD:1.062

AST-HB18B-200WL1B1T2A1-abc40WD:1.063

AST-HB18B-200WL1B1T2A1-abc50WD:1.064

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 BL-QP-033)

Test date	2022-09-27	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-UFHB-240W-354050K-BL (200W,35K) 35WD		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220900	120.0	60	1.728	206.94	0.998	2.39
5E-C1	277.0	60	0.784	204.26	0.941	8.62
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

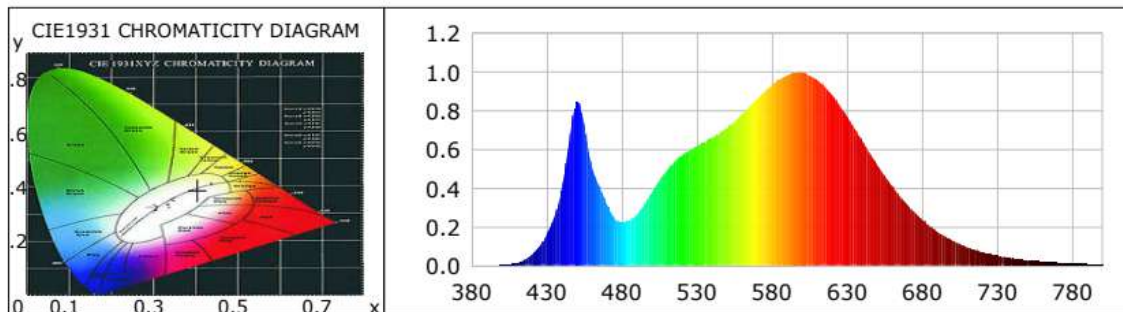
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	4
Frequency (Hz)	60	R2	89	R10	74
CCT (K)	3540	R3	95	R11	79
Duv	-0.0011	R4	81	R12	65
Chromaticity (x, y)	x=0.4020 y=0.3865	R5	81	R13	82
Chromaticity (u', v')	u(u')=0.2353 v'=0.5090	R6	85	R14	98
Color Rendering Index (CRI)	82	R7	83	R15	74
R9	4	R8	61	--	--
Rf	83	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-12				

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)	27267.4	27231.9	>=10000(-10%)
Luminous Efficacy (lm/W)	131.76	133.32	Premium: >= 135(-3%)
Most worst Luminous/Highest	131.59		
Zonal lumens in the 20-50 °zone (%)	64.70	--	>=30(-10%)
Beam Angle (°)	84.4	--	--
Center Beam Candle Power (cd)	14232	--	--

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.2238	535	0.5935	481.3626	690	0.3148	255.3118
385	0.0004	0.3333	540	0.6139	497.9130	695	0.2738	222.0771
390	0.0005	0.3691	545	0.6374	516.9342	700	0.2365	191.7910
395	0.0009	0.7560	550	0.6618	536.7253	705	0.2054	166.5972
400	0.0016	1.3365	555	0.6827	553.7367	710	0.1757	142.5124
405	0.0054	4.3461	560	0.7115	577.0908	715	0.1516	122.9501
410	0.0132	10.7423	565	0.7438	603.2878	720	0.1302	105.6151
415	0.0288	23.3621	570	0.7821	634.3365	725	0.1108	89.8481
420	0.0548	44.4433	575	0.8208	665.7073	730	0.0944	76.5281
425	0.0965	78.2272	580	0.8585	696.2969	735	0.0814	66.0050
430	0.1589	128.9059	585	0.9006	730.4316	740	0.0690	55.9348
435	0.2501	202.8710	590	0.9349	758.2771	745	0.0590	47.8691
440	0.3946	320.0708	595	0.9597	778.4023	750	0.0502	40.7253
445	0.6393	518.5210	600	0.9840	798.1252	755	0.0422	34.2018
450	0.8430	683.6884	605	0.9961	807.8670	760	0.0367	29.7784
455	0.7316	593.3448	610	0.9966	808.2989	765	0.0313	25.4214
460	0.5163	418.7444	615	0.9830	797.2457	770	0.0274	22.2521
465	0.4113	333.5791	620	0.9604	778.9741	775	0.0229	18.5970
470	0.3187	258.4974	625	0.9266	751.5408	780	0.0195	15.7918
475	0.2462	199.7002	630	0.8797	713.5312	785	0.0158	12.8366
480	0.2230	180.8690	635	0.8274	671.0959	790	0.0148	12.0062
485	0.2330	188.9947	640	0.7685	623.3138	795	0.0119	9.6366
490	0.2632	213.4355	645	0.7077	574.0153	800	0.0102	8.3126
495	0.3160	256.2668	650	0.6445	522.7388			
500	0.3778	306.4600	655	0.5801	470.5379			
505	0.4369	354.3495	660	0.5203	421.9654			
510	0.4926	399.5026	665	0.4639	376.2911			
515	0.5338	432.9863	670	0.4087	331.4908			
520	0.5661	459.1050	675	0.3587	290.9314			
525	0.5935	481.3626	680	0.3148	255.3118			
530	0.6139	497.9130	685	0.2738	222.0771			

TM30

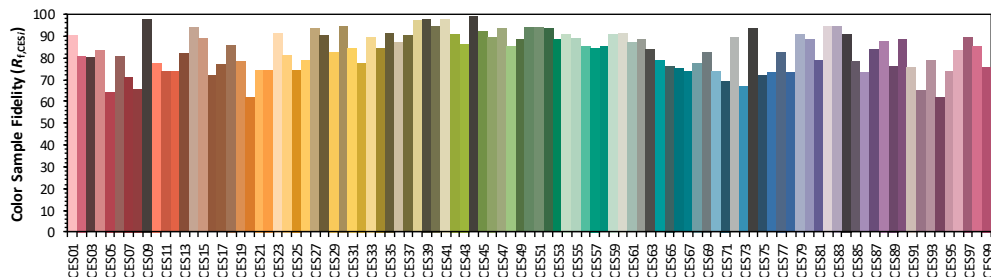
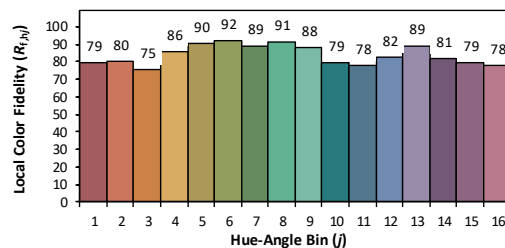
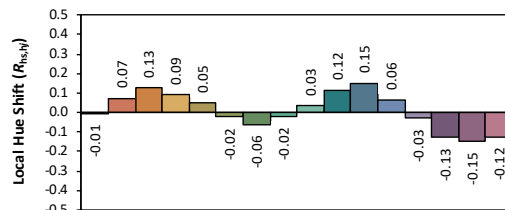
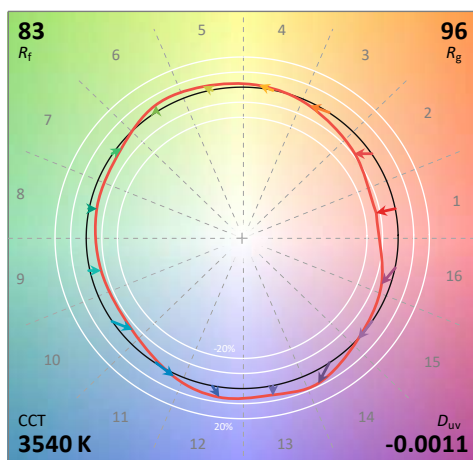
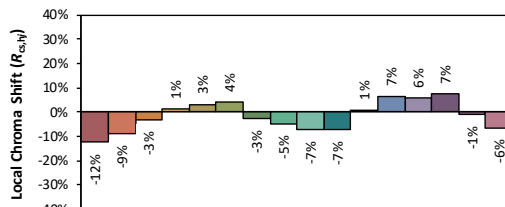
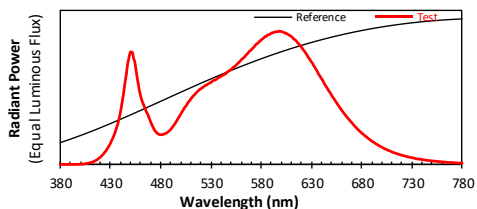
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RA35000H1

Manufacturer: IK10 LED LIGHTING

Date: 2022/9/27

Model: IK-UFHB-240W-354050K-BL (200W, 35K) 35WD



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

x 0.4020
 y 0.3865
 u' 0.2353
 v' 0.5090

CIE 13.3-1995
(CRI)

R_a 82
 R_9 4

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

Zonal Lumen Tabulation

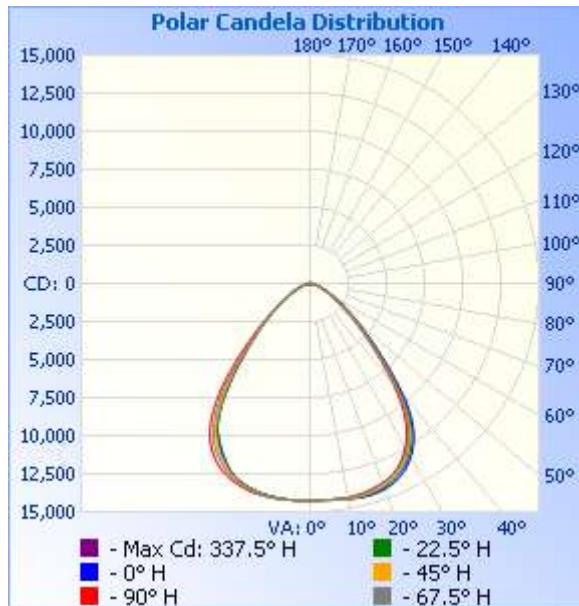
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	11,568.4	42.4%	42.4%
0-40	18,381.6	67.4%	67.4%
0-60	25,402.3	93.2%	93.2%
60-90	1,756.8	6.4%	6.4%
70-100	594.7	2.2%	2.2%
90-120	27.7	0.1%	0.1%
0-90	27,159.1	99.6%	99.6%
90-180	104.2	0.4%	0.4%
0-180	27,263.3	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	1,361.3	5.0%	90-100	9.1	0%
10-20	4,017.9	14.7%	100-110	8.9	0%
20-30	6,189.1	22.7%	110-120	9.7	0%
30-40	6,813.2	25.0%	120-130	11.7	0%
40-50	4,627.4	17.0%	130-140	15.2	0.1%
50-60	2,393.4	8.8%	140-150	17.8	0.1%
60-70	1,171.2	4.3%	150-160	16.1	0.1%
70-80	491.6	1.8%	160-170	11.5	0%
80-90	94.0	0.3%	170-180	4.1	0%

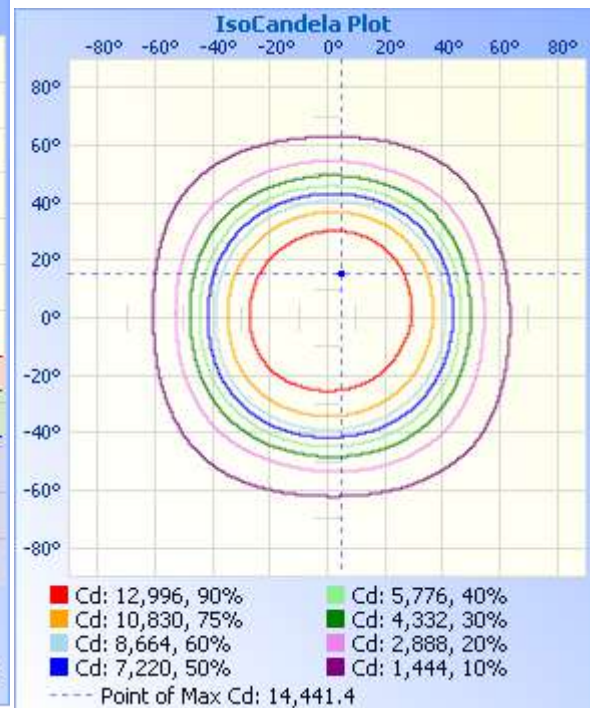
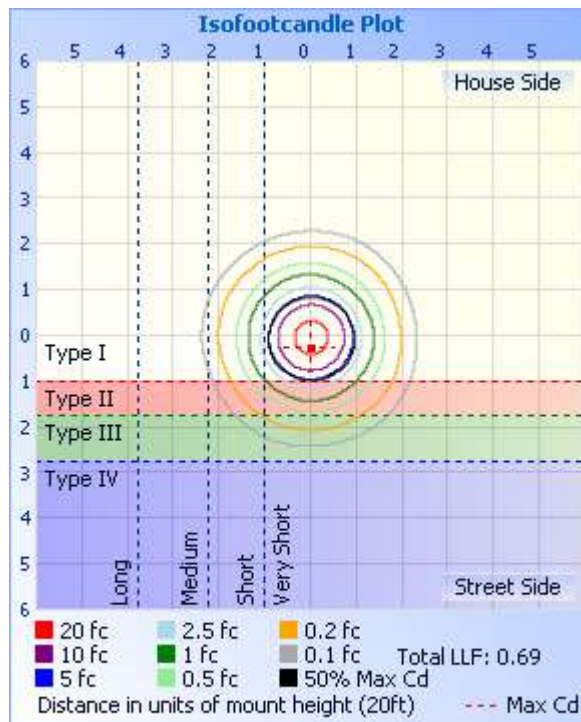
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	49.2 fc	30.8 ft	29.4 ft
34.0ft	12.3 fc	61.6 ft	58.7 ft
51.0ft	5.47 fc	92.4 ft	88.1 ft
68.0ft	3.08 fc	123.2 ft	117.5 ft
85.0ft	1.97 fc	154.0 ft	146.9 ft
102.0ft	1.37 fc	184.8 ft	176.2 ft

Vert. Spread: 84.4°
Horiz. Spread: 81.6°



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	14232	14232	14232	14232	14232	14232	14232	14232	14232	14232	14232	14232	14232	14232	14232	14232	14232
1	14230	14230	14229	14233	14236	14239	14228	14243	14228	14242	14243	14234	14230	14222	14221	14226	14230
2	14231	14225	14228	14232	14248	14248	14237	14244	14238	14244	14246	14248	14236	14222	14217	14226	14231
3	14231	14227	14233	14238	14253	14255	14246	14257	14248	14246	14258	14252	14241	14226	14220	14239	14231
4	14234	14231	14236	14248	14260	14259	14255	14253	14250	14250	14262	14255	14239	14224	14226	14241	14234
5	14246	14239	14246	14257	14274	14265	14251	14253	14257	14256	14265	14254	14255	14231	14231	14240	14246
6	14255	14251	14261	14279	14280	14273	14259	14252	14251	14253	14268	14261	14261	14244	14238	14256	14255
7	14275	14259	14281	14282	14286	14275	14243	14248	14245	14246	14267	14268	14267	14252	14256	14259	14275
8	14287	14278	14297	14298	14275	14265	14245	14245	14234	14242	14266	14275	14280	14270	14268	14292	14287
9	14317	14308	14315	14305	14271	14262	14244	14233	14222	14226	14254	14265	14282	14278	14292	14320	14317
10	14341	14343	14330	14305	14264	14248	14228	14218	14203	14213	14242	14250	14269	14285	14320	14352	14341
11	14369	14363	14344	14304	14256	14233	14208	14189	14187	14196	14223	14247	14275	14291	14334	14373	14369
12	14401	14375	14348	14291	14237	14217	14189	14168	14155	14176	14208	14235	14266	14296	14352	14400	14401
13	14421	14380	14350	14271	14208	14195	14161	14147	14123	14144	14174	14218	14254	14300	14372	14422	14421
14	14439	14379	14338	14244	14184	14175	14133	14117	14088	14104	14141	14182	14244	14298	14381	14429	14439
15	14438	14377	14321	14216	14155	14141	14095	14084	14040	14064	14104	14161	14215	14284	14379	14437	14438
16	14436	14363	14288	14187	14118	14106	14046	14037	13999	14011	14049	14112	14190	14265	14375	14441	14436

Laboratory: UTEST TECHNICAL 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

17	14429	14336	14246	14129	14074	14060	13999	13970	13942	13963	13999	14072	14154	14240	14360	14441	14429
18	14405	14307	14200	14079	14025	14019	13946	13906	13875	13899	13936	14010	14109	14203	14341	14422	14405
19	14376	14265	14149	14024	13983	13964	13873	13826	13802	13814	13860	13951	14049	14159	14316	14388	14376
20	14336	14213	14085	13960	13924	13903	13796	13747	13720	13735	13770	13866	13993	14111	14269	14356	14336
21	14279	14153	14012	13897	13862	13828	13714	13654	13619	13630	13682	13784	13926	14074	14225	14322	14279
22	14223	14073	13930	13818	13782	13747	13622	13542	13502	13517	13574	13690	13860	14015	14180	14266	14223
23	14148	13987	13829	13736	13672	13625	13514	13399	13359	13386	13446	13572	13766	13950	14115	14199	14148
24	14047	13881	13728	13633	13560	13512	13384	13246	13178	13225	13309	13459	13676	13869	14039	14131	14047
25	13950	13771	13613	13515	13433	13368	13239	13074	12993	13051	13135	13317	13572	13776	13939	14038	13950
26	13836	13654	13480	13386	13281	13222	13037	12881	12793	12870	12981	13157	13451	13664	13824	13923	13836
27	13696	13509	13322	13228	13116	13019	12833	12657	12590	12672	12804	13002	13308	13512	13690	13767	13696
28	13532	13341	13154	13058	12902	12814	12608	12437	12377	12468	12616	12839	13155	13350	13562	13626	13532
29	13367	13161	12965	12860	12689	12571	12363	12207	12141	12232	12410	12648	12963	13179	13387	13461	13367
30	13155	12947	12730	12644	12454	12320	12102	11977	11923	12001	12160	12440	12783	12999	13216	13266	13155
31	12948	12733	12505	12396	12202	12056	11848	11736	11684	11754	11909	12208	12577	12778	12984	13060	12948
32	12689	12492	12251	12103	11928	11751	11578	11481	11424	11482	11640	11915	12324	12566	12759	12823	12689
33	12433	12182	11973	11804	11595	11446	11304	11163	11134	11165	11334	11610	12049	12325	12514	12539	12433
34	12140	11865	11667	11491	11257	11130	10999	10834	10762	10808	10994	11280	11750	12053	12222	12250	12140
35	11800	11515	11295	11157	10878	10764	10652	10447	10362	10362	10551	10915	11412	11741	11920	11926	11800

Laboratory: UTEST TECHNICAL 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

36	11426	11129	10901	10747	10457	10372	10262	10031	9919	9915	10112	10519	11048	11372	11535	11562	11426
37	10995	10682	10407	10316	9993	9886	9755	9558	9436	9432	9658	10040	10590	10990	11151	11121	10995
38	10507	10172	9900	9778	9446	9400	9226	8982	8853	8905	9155	9566	10131	10564	10700	10662	10507
39	9950	9605	9329	9226	8898	8862	8662	8436	8332	8348	8582	9047	9624	10014	10187	10120	9950
40	9353	8991	8743	8642	8355	8311	8043	7862	7795	7822	8055	8512	9085	9515	9609	9590	9353
41	8796	8393	8124	8027	7791	7718	7440	7295	7275	7312	7534	7952	8537	8931	9013	8965	8796
42	8124	7800	7535	7448	7226	7133	6798	6762	6767	6830	7027	7388	7962	8372	8439	8352	8124
43	7542	7238	6976	6878	6648	6535	6262	6215	6261	6378	6541	6795	7378	7735	7772	7682	7542
44	6970	6691	6447	6340	6156	6019	5759	5735	5826	5907	6028	6294	6824	7144	7163	7088	6970
45	6430	6129	5902	5848	5689	5530	5258	5297	5425	5509	5581	5817	6285	6604	6586	6547	6430
46	5940	5673	5457	5414	5240	5068	4844	4882	5040	5125	5160	5328	5788	6100	6074	6043	5940
47	5516	5251	5053	5032	4821	4603	4462	4505	4690	4761	4776	4943	5290	5621	5602	5528	5516
48	5080	4826	4683	4645	4411	4229	4109	4118	4322	4416	4413	4585	4878	5122	5129	5091	5080
49	4696	4465	4328	4310	4070	3893	3782	3794	4012	4053	4054	4253	4497	4696	4719	4681	4696
50	4332	4115	3962	3990	3761	3592	3446	3496	3716	3759	3757	3924	4121	4290	4333	4289	4332
51	3985	3794	3644	3674	3482	3304	3162	3206	3434	3487	3476	3629	3776	3950	3972	3941	3985
52	3693	3512	3357	3382	3200	3027	2913	2930	3176	3241	3229	3355	3440	3640	3647	3586	3693
53	3399	3244	3089	3136	2946	2789	2690	2699	2904	3020	2975	3096	3169	3334	3360	3305	3399
54	3156	2985	2827	2873	2710	2570	2493	2505	2683	2784	2764	2862	2923	3072	3078	3050	3156

Laboratory: UTEST TECHNICAL 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

55	2918	2764	2609	2659	2489	2369	2298	2324	2482	2583	2567	2628	2676	2822	2846	2812	2918
56	2688	2552	2412	2447	2257	2163	2132	2150	2297	2395	2381	2440	2487	2593	2627	2597	2688
57	2483	2357	2234	2247	2066	1993	1983	2004	2103	2215	2190	2266	2298	2364	2419	2394	2483
58	2270	2183	2069	2074	1886	1831	1842	1864	1941	2044	2022	2105	2115	2167	2236	2217	2270
59	2095	2005	1917	1897	1733	1686	1716	1734	1792	1869	1876	1952	1968	1980	2047	2053	2095
60	1928	1858	1785	1754	1581	1549	1595	1612	1646	1719	1722	1809	1838	1811	1886	1903	1928
61	1770	1713	1642	1621	1450	1416	1479	1498	1516	1576	1587	1660	1711	1654	1741	1769	1770
62	1621	1577	1528	1481	1319	1305	1368	1382	1392	1431	1444	1539	1586	1516	1595	1630	1621
63	1492	1454	1422	1368	1209	1203	1272	1278	1276	1309	1327	1437	1456	1374	1468	1513	1492
64	1350	1336	1318	1248	1109	1108	1164	1182	1166	1192	1216	1325	1356	1257	1344	1409	1350
65	1235	1231	1221	1154	1015	1012	1074	1090	1074	1094	1115	1209	1246	1155	1238	1302	1235
66	1127	1133	1128	1053	928	930	982	993	985	997	1025	1117	1151	1062	1136	1199	1127
67	1029	1043	1052	969	853	854	902	915	895	913	933	1028	1064	977	1044	1109	1029
68	939	958	965	891	794	789	825	844	821	826	863	954	981	895	955	1022	939
69	855	875	892	812	722	718	753	768	750	762	793	868	890	824	876	943	855
70	785	795	816	746	661	656	687	704	686	697	732	804	813	761	801	864	785
71	710	728	751	677	608	601	624	637	619	633	664	732	744	691	728	792	710
72	653	653	679	610	555	549	569	579	562	579	604	665	675	639	663	716	653
73	591	597	618	558	503	500	510	526	512	524	548	608	617	582	605	651	591

Laboratory: UTEST TECHNICAL 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

74	527	540	555	494	447	444	459	466	462	476	498	547	557	529	543	587	527
75	467	472	493	441	401	400	411	420	409	420	440	491	497	471	490	528	467
76	416	422	428	394	358	359	366	378	364	382	390	437	444	418	431	458	416
77	372	371	380	347	317	311	320	330	322	333	353	384	394	379	382	407	372
78	324	324	330	299	281	275	274	287	283	298	311	337	344	332	337	356	324
79	286	282	287	262	236	232	238	251	244	256	267	292	307	293	290	312	286
80	242	239	243	226	202	199	209	212	208	217	235	251	262	250	257	267	242
81	202	202	200	189	171	170	169	178	172	186	195	211	222	219	214	228	202
82	169	165	169	152	137	136	139	143	145	153	166	176	188	180	175	187	169
83	136	131	129	121	112	108	108	114	114	120	130	140	154	145	146	153	136
84	104	98	101	96	83	80	82	80	84	89	98	108	120	113	114	116	104
85	74	73	66	61	64	46	53	49	59	62	66	78	95	84	85	85	74
86	54	35	43	41	41	34	29	36	32	38	36	48	67	54	55	57	54
87	25	25	19	17	21	15	14	22	18	18	21	21	45	37	30	30	25
88	14	12	12	13	16	11	11	13	8	13	13	17	19	18	11	21	14
89	10	0	0	16	14	9	7	14	9	11	8	14	15	12	11	12	10
90	0	10	8	12	16	10	0	11	8	8	10	11	12	11	0	15	0
91	0	9	0	12	20	8	0	12	0	9	8	12	15	11	10	14	0
92	0	0	0	11	19	10	7	13	7	9	0	12	16	13	8	13	0

Laboratory: UTEST TECHNICAL 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

93	0	8	9	13	17	8	0	8	9	7	0	13	13	10	7	13	0
94	0	9	8	9	14	8	7	15	0	9	9	9	13	14	8	12	0
95	8	0	11	12	16	10	0	11	0	8	8	10	13	12	8	10	8
96	8	8	0	10	17	10	0	11	0	8	0	11	12	7	9	14	8
97	9	8	0	12	15	12	0	11	9	7	0	0	10	12	7	14	9
98	8	10	0	9	15	0	7	10	0	8	0	10	16	0	11	11	8
99	9	8	9	9	17	12	0	11	8	10	0	8	12	10	9	11	9
100	8	10	0	12	15	13	0	12	0	0	0	12	13	10	7	12	8
101	0	0	8	12	17	0	0	10	0	11	0	9	13	8	9	11	0
102	9	0	0	11	18	10	0	12	0	8	0	8	14	10	11	0	9
103	0	10	0	9	13	10	9	12	8	9	0	11	12	7	0	14	0
104	8	0	7	13	17	13	7	12	0	8	7	12	13	12	7	13	8
105	9	8	8	13	19	14	0	14	0	0	8	14	10	9	0	16	9
106	9	8	0	12	19	7	7	12	8	9	0	14	11	12	9	13	9
107	9	0	7	13	13	0	8	11	9	10	0	14	14	10	0	12	9
108	8	7	0	14	15	11	9	13	0	8	9	14	12	11	9	14	8
109	8	7	12	12	14	14	0	13	0	8	0	12	13	12	11	11	8
110	0	8	8	12	17	13	0	11	0	9	0	0	16	7	11	14	0
111	0	0	0	13	12	9	11	12	9	10	0	0	13	9	8	16	0

Laboratory: UTEST TECHNICAL 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

112	0	8	9	11	18	12	0	14	0	0	0	11	10	14	10	10	0
113	10	9	11	11	20	12	7	14	0	12	0	9	12	11	9	14	10
114	10	8	9	14	20	14	7	14	10	8	10	12	15	10	7	14	10
115	10	7	8	11	16	10	11	14	0	10	11	8	14	12	10	14	10
116	0	9	12	13	16	13	10	14	8	9	10	14	14	8	7	14	0
117	11	10	10	15	19	12	9	10	0	9	10	11	12	14	0	12	11
118	8	8	8	10	19	8	0	16	9	10	0	11	15	10	8	14	8
119	8	0	11	10	15	11	9	14	11	12	0	13	15	11	9	14	8
120	7	10	11	15	19	12	10	15	13	11	10	14	15	12	11	12	7
121	9	12	10	15	19	17	0	17	9	10	10	16	15	15	11	7	9
122	8	11	8	15	21	14	11	14	0	14	7	13	13	14	11	16	8
123	0	9	11	15	22	17	0	14	9	13	10	13	15	11	15	13	0
124	9	0	11	14	25	15	10	16	0	10	11	13	16	15	9	13	9
125	10	13	10	16	22	15	10	12	11	15	11	12	15	10	13	14	10
126	11	13	9	0	20	15	14	13	10	13	12	18	14	17	15	14	11
127	10	14	12	14	22	16	11	15	13	8	10	18	16	14	16	15	10
128	11	12	11	19	19	19	12	18	13	12	11	15	19	16	15	11	11
129	8	16	15	18	23	16	13	20	10	16	9	12	18	16	18	17	8
130	12	12	11	22	15	16	14	24	12	16	12	19	17	19	16	17	12

Laboratory: UTEST TECHNICAL 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

131	9	14	14	17	21	18	15	18	17	17	11	17	20	11	20	16	9
132	15	18	14	19	23	18	11	21	17	16	14	18	16	17	14	17	15
133	14	16	17	18	29	18	17	23	17	18	20	19	15	22	17	20	14
134	14	17	17	20	27	20	16	23	19	16	13	21	22	21	16	22	14
135	15	16	16	20	25	22	20	25	15	20	19	22	24	19	19	19	15
136	16	16	19	18	28	22	14	22	20	21	18	24	18	20	23	21	16
137	19	20	17	21	29	19	18	25	24	24	21	25	18	18	10	22	19
138	21	24	25	21	31	23	16	27	24	18	19	26	23	26	27	26	21
139	18	21	21	25	32	27	18	29	24	22	14	23	23	28	27	26	18
140	16	23	24	27	27	23	24	29	24	25	15	22	28	23	22	26	16
141	22	24	27	26	31	29	29	25	23	24	23	30	27	24	24	31	22
142	22	26	26	25	32	29	23	31	28	28	23	30	29	28	18	26	22
143	27	25	26	28	34	27	28	29	28	29	25	20	29	26	28	27	27
144	28	28	25	28	37	31	17	28	28	30	24	28	34	28	29	24	28
145	23	31	26	30	28	32	28	32	29	26	28	32	36	28	30	32	23
146	27	28	30	34	40	28	30	35	33	31	23	30	29	29	33	31	27
147	21	26	29	34	33	30	31	35	27	32	26	31	16	27	32	31	21
148	28	31	30	34	33	34	32	33	30	26	27	33	33	26	23	32	28
149	22	29	30	31	36	32	33	38	27	29	31	34	35	33	35	32	22

Laboratory: UTEST TECHNICAL 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

150	25	27	31	33	41	26	33	30	20	28	32	37	33	28	32	35	25
151	30	32	31	33	43	30	33	32	33	32	29	37	36	31	36	29	30
152	31	32	28	36	45	37	28	37	30	31	30	36	39	34	35	38	31
153	24	32	28	30	33	32	34	40	32	35	37	36	38	37	37	38	24
154	32	30	25	38	42	35	35	40	39	40	35	36	37	37	33	37	32
155	36	30	36	39	43	39	34	36	35	37	28	41	39	39	33	31	36
156	34	22	36	33	39	27	34	38	30	37	38	41	34	36	38	40	34
157	33	38	30	38	44	36	30	40	35	32	36	39	41	31	40	40	33
158	30	37	36	39	41	31	35	42	38	35	34	40	34	37	41	42	30
159	37	37	39	35	42	39	25	44	21	33	35	40	36	38	34	37	37
160	29	38	39	37	43	40	35	32	38	28	26	40	40	35	38	42	29
161	27	41	37	44	48	40	26	43	42	41	36	43	38	43	38	46	27
162	36	37	31	44	46	45	33	33	37	37	36	44	41	34	38	48	36
163	38	40	40	39	50	41	42	42	43	39	38	47	45	39	41	46	38
164	34	37	38	39	43	41	23	34	41	44	34	38	39	36	39	42	34
165	38	42	37	41	40	41	41	45	43	40	36	35	45	45	38	50	38
166	39	37	44	33	42	41	39	47	44	38	41	46	40	44	44	46	39
167	41	41	41	45	44	27	33	50	40	39	39	45	43	44	44	48	41
168	38	45	36	43	52	50	39	46	41	46	34	45	44	44	36	47	38

Laboratory: UTEST TECHNICAL 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

169	44	45	46	48	42	48	47	34	44	50	43	47	47	44	38	46	44
170	38	42	40	49	44	46	40	48	40	40	45	50	31	37	43	48	38
171	34	42	40	44	42	45	37	50	46	47	35	45	45	38	39	48	34
172	39	38	37	43	53	48	44	38	45	37	40	48	45	47	43	44	39
173	39	42	40	46	53	43	44	39	43	44	40	42	45	39	41	41	39
174	43	39	44	46	49	49	42	44	44	45	44	45	48	40	44	44	43
175	43	41	35	47	35	44	43	48	41	44	43	46	48	44	43	32	43
176	40	40	40	47	49	40	41	49	44	35	38	47	46	44	48	43	40
177	35	45	42	46	48	43	42	47	41	46	40	45	46	43	27	37	35
178	41	44	37	48	50	49	42	50	42	45	38	45	48	44	43	40	41
179	36	43	42	20	50	43	38	45	36	42	36	40	51	38	42	47	36
180	39	40	40	36	46	174	40	43	41	40	29	44	43	40	36	47	39

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	24.3	25.6	24.6	25.9	26.2	23.4	24.7	23.7	25.0	25.3
	3H	25.1	26.2	25.5	26.6	26.9	24.1	25.3	24.5	25.6	26.0
	4H	25.3	26.4	25.7	26.7	27.1	24.3	25.4	24.7	25.8	26.2
	6H	25.4	26.4	25.8	26.8	27.2	24.4	25.4	24.8	25.8	26.2
	8H	25.4	26.4	25.9	26.8	27.2	24.4	25.4	24.9	25.8	26.2
	12H	25.4	26.3	25.8	26.7	27.1	24.4	25.3	24.9	25.7	26.1
4H	2H	24.5	25.6	24.9	26.0	26.3	23.7	24.8	24.1	25.1	25.5
	3H	25.5	26.4	25.9	26.8	27.2	24.6	25.5	25.0	25.9	26.3
	4H	25.8	26.6	26.2	27.0	27.5	24.9	25.7	25.3	26.1	26.5
	6H	26.0	26.7	26.5	27.1	27.6	25.1	25.7	25.5	26.2	26.7
	8H	26.0	26.7	26.5	27.1	27.6	25.1	25.7	25.6	26.2	26.6
	12H	26.0	26.6	26.5	27.1	27.6	25.1	25.6	25.6	26.1	26.6
8H	4H	25.9	26.5	26.3	27.0	27.4	25.0	25.6	25.4	26.1	26.5
	6H	26.1	26.6	26.6	27.1	27.6	25.2	25.7	25.7	26.2	26.7
	8H	26.2	26.6	26.7	27.2	27.7	25.2	25.7	25.7	26.2	26.7
	12H	26.2	26.6	26.7	27.1	27.7	25.2	25.7	25.8	26.2	26.7
12H	4H	25.8	26.4	26.3	26.9	27.4	24.9	25.5	25.4	26.0	26.5
	6H	26.1	26.6	26.6	27.0	27.6	25.2	25.7	25.7	26.1	26.7
	8H	26.2	26.6	26.7	27.1	27.7	25.2	25.7	25.8	26.2	26.7

Maximum UGR = 27.7

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-09-27	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-UFHB-240W-354050K-BL (200W,40K) 40WD		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220900	120.0	60	1.670	199.83	0.997	2.36
5E-C2	277.0	60	0.753	196.18	0.941	8.76
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

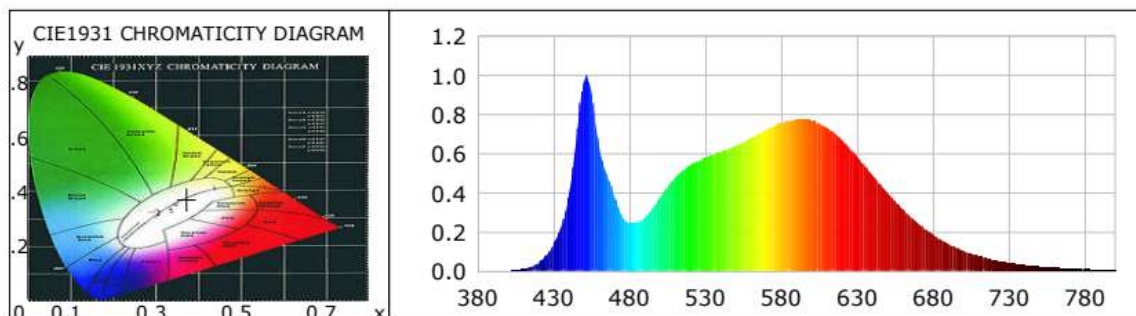
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	13
Frequency (Hz)	60	R2	90	R10	75
CCT (K)	4220	R3	94	R11	81
Duv	-0.0010	R4	83	R12	61
Chromaticity (x, y)	x=0.3706 y=0.3683	R5	83	R13	84
Chromaticity (u', v')	u(u')=0.2220 v'=0.4963	R6	85	R14	97
Color Rendering Index (CRI)	84	R7	86	R15	77
R9	14	R8	67	--	--
Rf	84	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-12				

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)	29576.8	29317.1	>=10000(-10%)
Luminous Efficacy (lm/W)	148.01	149.44	Premium: >= 135(-3%)
Most worst Luminous/Highest Watts	146.71		

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0005	0.5861	535	0.5610	666.6200	690	0.2429	288.6973
385	0.0005	0.6123	540	0.5772	685.8772	695	0.2127	252.7642
390	0.0004	0.4961	545	0.5919	703.3892	700	0.1847	219.5040
395	0.0003	0.4098	550	0.6082	722.7734	705	0.1608	191.1451
400	0.0013	1.5247	555	0.6218	738.9834	710	0.1389	165.0302
405	0.0035	4.1105	560	0.6390	759.4096	715	0.1196	142.1692
410	0.0089	10.6116	565	0.6578	781.6537	720	0.1029	122.3262
415	0.0202	23.9667	570	0.6797	807.6845	725	0.0881	104.7254
420	0.0411	48.8345	575	0.7001	832.0148	730	0.0751	89.2726
425	0.0767	91.1532	580	0.7185	853.8900	735	0.0653	77.6063
430	0.1340	159.2869	585	0.7415	881.2036	740	0.0559	66.4128
435	0.2260	268.5904	590	0.7570	899.6340	745	0.0475	56.4704
440	0.3786	449.8960	595	0.7662	910.5704	750	0.0402	47.7762
445	0.6653	790.6005	600	0.7753	921.3797	755	0.0347	41.2583
450	0.9685	1150.9921	605	0.7754	921.4815	760	0.0290	34.4562
455	0.9150	1087.3281	610	0.7694	914.3673	765	0.0257	30.5576
460	0.6384	758.6325	615	0.7539	895.9552	770	0.0222	26.3725
465	0.4951	588.3410	620	0.7339	872.1527	775	0.0191	22.6608
470	0.3832	455.4390	625	0.7052	837.9859	780	0.0159	18.8741
475	0.2844	337.9387	630	0.6682	794.0551	785	0.0140	16.6630
480	0.2451	291.2613	635	0.6277	745.9333	790	0.0116	13.7374
485	0.2479	294.6228	640	0.5835	693.4665	795	0.0103	12.1819
490	0.2707	321.7323	645	0.5386	640.0586	800	0.0085	10.1115
495	0.3164	376.0469	650	0.4901	582.4458			
500	0.3733	443.6131	655	0.4427	526.1123			
505	0.4269	507.3190	660	0.3983	473.2857			
510	0.4762	565.9252	665	0.3549	421.7974			
515	0.5129	609.5387	670	0.3143	373.4753			
520	0.5385	639.9148	675	0.2776	329.9115			
525	0.5610	666.6200	680	0.2429	288.6973			
530	0.5772	685.8772	685	0.2127	252.7642			

TM30

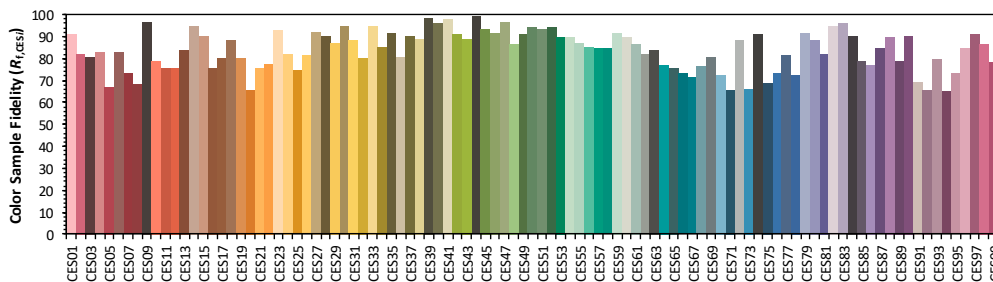
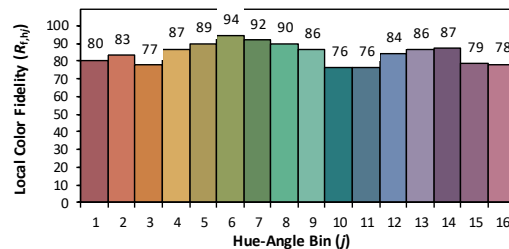
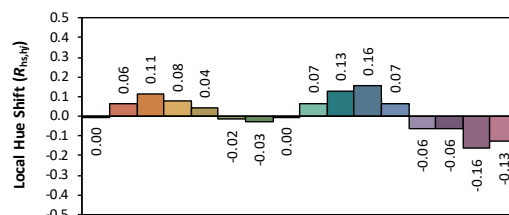
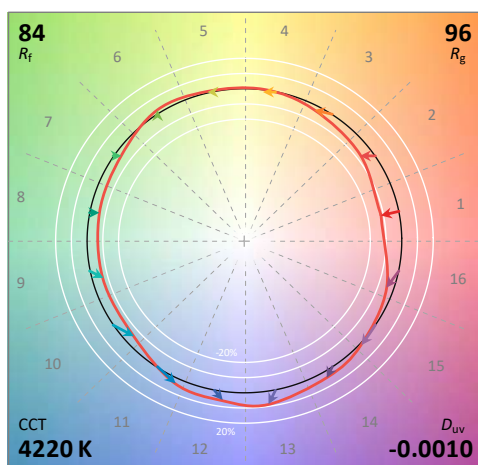
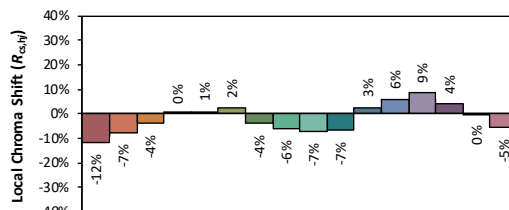
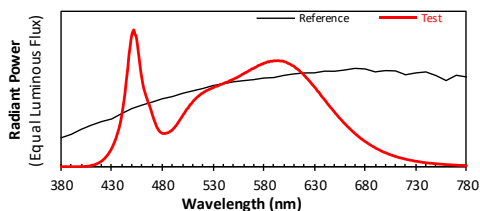
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RA35000H1

Manufacturer: IKIO LED LIGHTING

Date: 2022/9/27

Model: IK-UFHB-240W-354050K-BL (200W, 40K) 40WD



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

x 0.3706
 y 0.3683
 u' 0.2220
 v' 0.4963

CIE 13.3-1995
(CRI)
 R_a 84
 R_g 14

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

2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-09-27	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-UFHB-240W-354050K-BL (200W,50K) 50WD		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220900	120.0	60	1.725	206.60	0.998	2.35
5E-C2	277.0	60	0.784	204.23	0.941	8.48
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

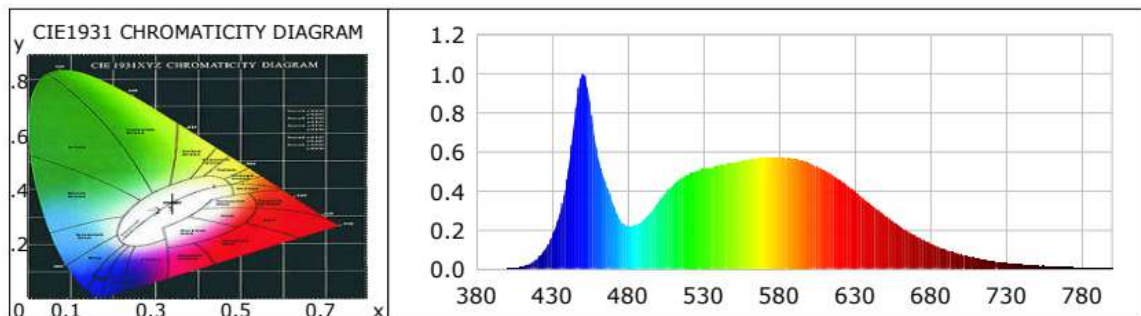
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	13
Frequency (Hz)	60	R2	87	R10	69
CCT (K)	5243	R3	90	R11	83
Duv	0.0012	R4	84	R12	61
Chromaticity (x, y)	x=0.3387 y=0.3488	R5	83	R13	83
Chromaticity (u', v')	u(u')=0.2082 v'=0.4823	R6	82	R14	95
Color Rendering Index (CRI)	83	R7	87	R15	78
R9	13	R8	70	--	--
Rf	83	--	--	--	--
Rg	97	--	--	--	--
Rcs,h1(%)	-12				

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)	27469.5	27424.0	>=10000(-10%)
Luminous Efficacy (lm/W)	132.96	134.28	Premium: >= 135(-3%)
Most worst Luminous/Highest Watts	132.74		

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.4772	535	0.5010	601.9965	690	0.1686	202.5750
385	0.0005	0.5516	540	0.5113	614.3678	695	0.1484	178.3451
390	0.0011	1.2880	545	0.5202	625.1591	700	0.1291	155.1475
395	0.0005	0.5591	550	0.5302	637.0930	705	0.1135	136.3309
400	0.0012	1.4123	555	0.5362	644.3533	710	0.0980	117.7992
405	0.0042	4.9978	560	0.5432	652.7296	715	0.0853	102.4990
410	0.0110	13.2621	565	0.5518	663.0557	720	0.0735	88.3229
415	0.0254	30.4931	570	0.5598	672.6466	725	0.0630	75.7461
420	0.0507	60.9253	575	0.5642	677.9853	730	0.0543	65.2521
425	0.0946	113.7193	580	0.5682	682.7720	735	0.0468	56.2354
430	0.1655	198.9096	585	0.5729	688.4256	740	0.0403	48.4168
435	0.2784	334.5552	590	0.5718	687.1246	745	0.0341	40.9494
440	0.4655	559.4058	595	0.5670	681.3309	750	0.0290	34.9058
445	0.7702	925.5477	600	0.5624	675.8404	755	0.0247	29.6713
450	1.0000	1201.6703	605	0.5541	665.8240	760	0.0218	26.1865
455	0.8591	1032.3804	610	0.5423	651.7109	765	0.0183	21.9437
460	0.5904	709.5226	615	0.5236	629.1828	770	0.0156	18.7120
465	0.4514	542.4840	620	0.5055	607.4667	775	0.0145	17.4235
470	0.3383	406.4800	625	0.4828	580.2185	780	0.0108	13.0172
475	0.2517	302.4659	630	0.4557	547.5959	785	0.0097	11.6741
480	0.2192	263.3663	635	0.4253	511.0509	790	0.0090	10.8398
485	0.2222	266.9658	640	0.3960	475.8616	795	0.0071	8.5150
490	0.2458	295.3882	645	0.3657	439.4179	800	0.0056	6.7357
495	0.2890	347.2303	650	0.3335	400.7359			
500	0.3411	409.8784	655	0.3019	362.7334			
505	0.3878	466.0225	660	0.2714	326.0749			
510	0.4311	518.0997	665	0.2444	293.6799			
515	0.4627	555.9958	670	0.2172	260.9447			
520	0.4829	580.2897	675	0.1922	230.9553			
525	0.5010	601.9965	680	0.1686	202.5750			
530	0.5113	614.3678	685	0.1484	178.3451			

TM30

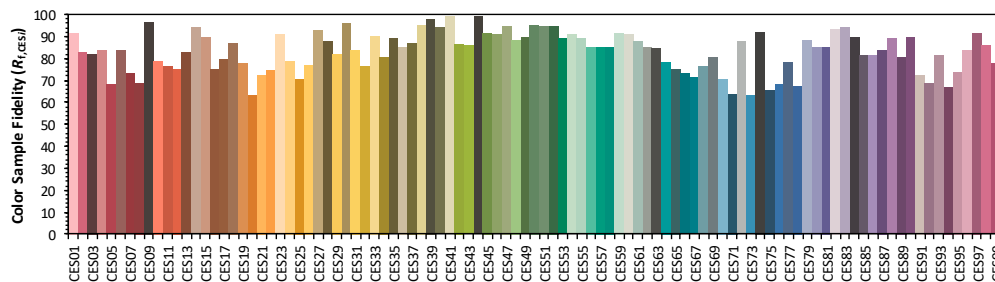
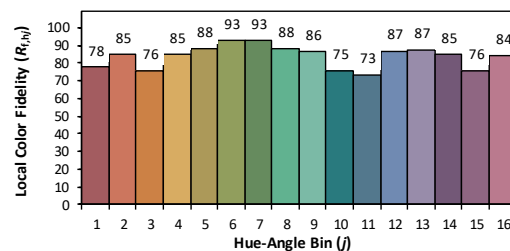
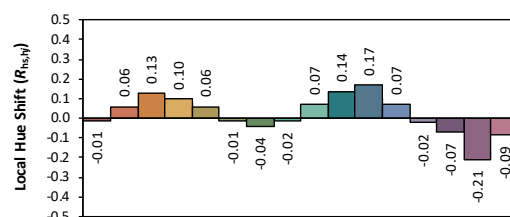
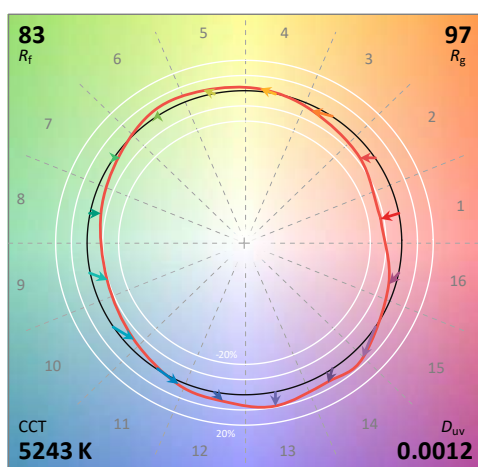
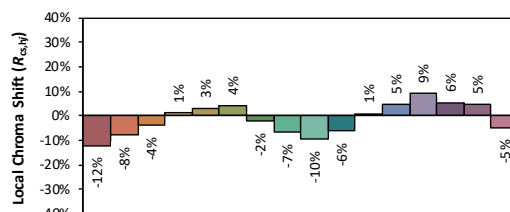
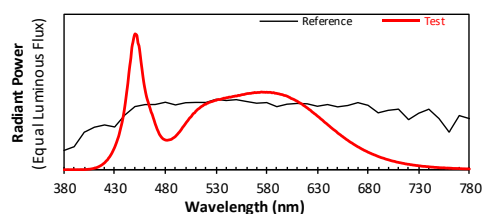
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RA35000H1

Manufacturer: IKIO LED LIGHTING

Date: 2022/9/27

Model: IK-UFHB-240W-354050K-BL (200W, 50K) 50WD



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

X	0.3388
-----	--------

 y 0.3488

u'	0.2082
------	--------

 $V' \quad 0.4823$

CIE 13.3-1995
(CRI)

 R_a 83 R_9 13

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

3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2022-01-18
AC Power Source	CHP-500C	DYBWD010159	2022-01-25
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2022-01-25
Digital Power Meter	WT500	DYDWQ20010	2022-01-25
Integral Sphere (2M)	2M	DYJCE120067	2022-01-18
Digital Power Meter	WT500	DYDWQ200006	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 *******