

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 (240W)

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

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

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

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

Test & Report By:

Candy Chen

Engineer: Candy Chen

Date: 2022-09-29

Review By:

Jason Luo

Manager: Jason Luo

1.1 Product Information:

Organization Name	IKIO LED LIGHTING	
Brand Name	IKIO	
Model Number	IK-UFHB-240W-354050K-BL (240W)	
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	240W(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-D1	
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-240WL1B1T2A1-abc35WD:1.063

AST-HB18B-240WL1B1T2A1-abc40WD:1.065

AST-HB18B-240WL1B1T2A1-abc50WD:1.062

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 (240W,35K) 35WD		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220900	120.0	60	2.009	240.58	0.998	2.07
5E-D1	277.0	60	0.902	235.61	0.943	9.55
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

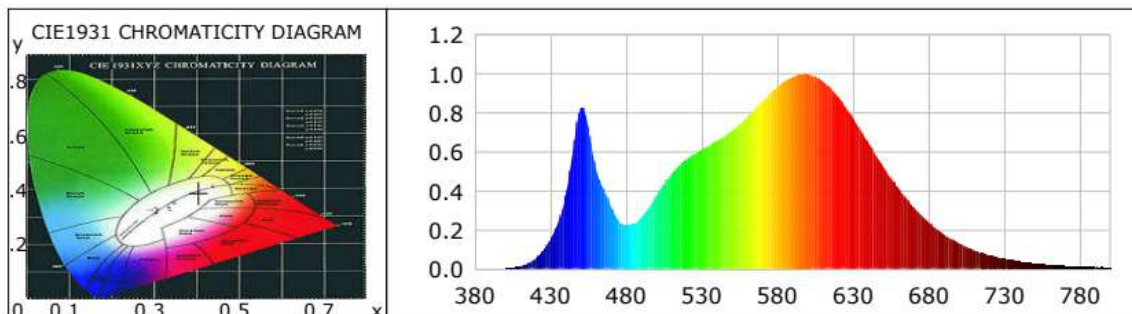
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	4
Frequency (Hz)	60	R2	89	R10	74
CCT (K)	3510	R3	95	R11	79
Duv	-0.0011	R4	80	R12	65
Chromaticity (x, y)	x=0.4036 y=0.3875	R5	80	R13	82
Chromaticity (u', v')	u(u')=0.2360 v'=0.5097	R6	86	R14	98
Color Rendering Index (CRI)	82	R7	83	R15	74
R9	4	R8	60	--	--
Rf	83	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-13				

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)	32298.2	32101.1	>=10000(-10%)
Luminous Efficacy (lm/W)	134.25	136.25	Premium: >= 135(-3%)
Most worst Luminous/Highest	133.43		
Zonal lumens in the 20-50 °zone (%)	65.50	--	>=30(-10%)
Beam Angle (°)	88.4	--	--
Center Beam Candle Power (cd)	15856	--	--

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	0.1796	535	0.5886	554.1163	690	0.3159	297.3492
385	0.0005	0.4420	540	0.6084	572.8000	695	0.2741	258.0076
390	0.0007	0.6665	545	0.6318	594.8169	700	0.2383	224.3449
395	0.0004	0.3515	550	0.6564	617.9207	705	0.2067	194.5767
400	0.0017	1.5547	555	0.6781	638.3455	710	0.1775	167.0836
405	0.0051	4.7546	560	0.7082	666.7468	715	0.1529	143.9659
410	0.0123	11.5997	565	0.7391	695.7652	720	0.1315	123.7691
415	0.0272	25.6087	570	0.7781	732.4903	725	0.1115	104.9539
420	0.0517	48.6526	575	0.8172	769.3756	730	0.0963	90.6994
425	0.0914	86.0710	580	0.8553	805.2225	735	0.0813	76.5714
430	0.1504	141.5982	585	0.8987	846.0920	740	0.0692	65.1644
435	0.2371	223.2566	590	0.9339	879.1777	745	0.0602	56.6499
440	0.3737	351.8223	595	0.9607	904.3762	750	0.0507	47.7702
445	0.6103	574.5855	600	0.9848	927.1540	755	0.0433	40.8083
450	0.8241	775.8262	605	0.9955	937.2040	760	0.0377	35.4868
455	0.7315	688.6534	610	0.9981	939.6381	765	0.0318	29.8904
460	0.5165	486.2841	615	0.9852	927.4424	770	0.0276	25.9924
465	0.4130	388.8285	620	0.9622	905.8252	775	0.0228	21.4316
470	0.3215	302.6953	625	0.9283	873.9074	780	0.0196	18.4123
475	0.2479	233.4069	630	0.8835	831.7849	785	0.0171	16.0983
480	0.2233	210.2112	635	0.8305	781.8056	790	0.0155	14.6148
485	0.2330	219.3203	640	0.7723	727.0900	795	0.0123	11.5506
490	0.2622	246.8844	645	0.7107	669.0602	800	0.0104	9.7887
495	0.3122	293.8890	650	0.6478	609.8132			
500	0.3737	351.8282	655	0.5821	548.0369			
505	0.4318	406.5467	660	0.5229	492.2772			
510	0.4862	457.7126	665	0.4656	438.2795			
515	0.5292	498.1737	670	0.4108	386.7003			
520	0.5598	526.9779	675	0.3606	339.4428			
525	0.5886	554.1163	680	0.3159	297.3492			
530	0.6084	572.8000	685	0.2741	258.0076			

TM30

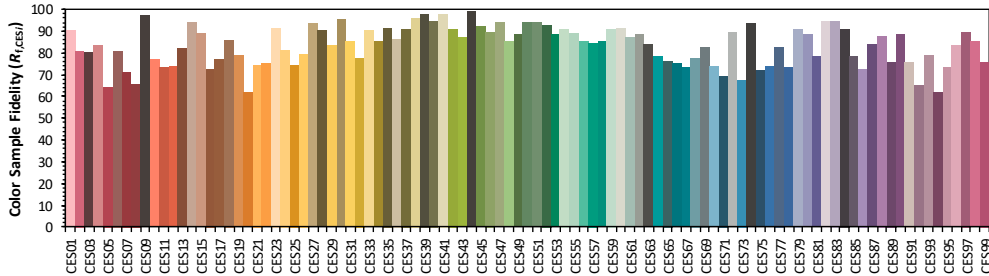
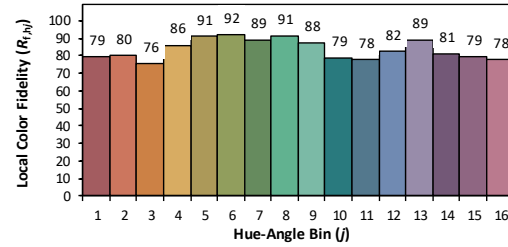
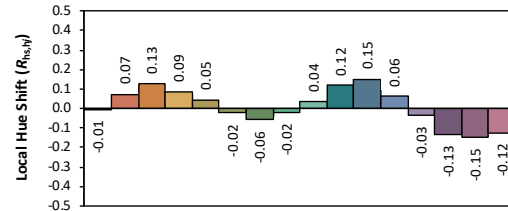
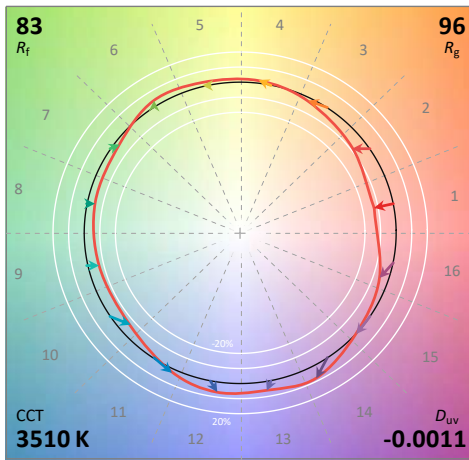
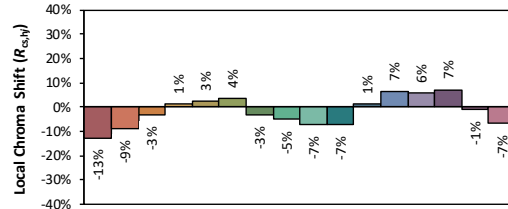
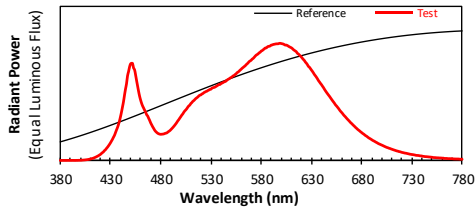
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RA35000H1

Manufacturer: IKIO LED LIGHTING

Date: 2022/9/27

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



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

x 0.4037
 y 0.3875
 u' 0.2360
 v' 0.5097

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

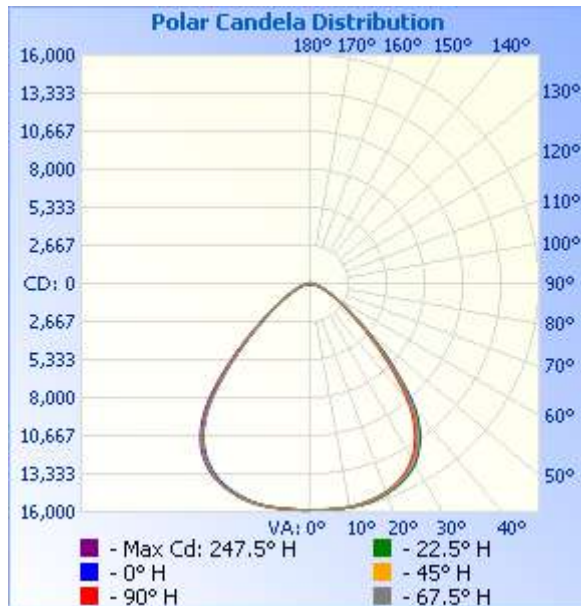
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	12,967.8	40.2%	40.2%
0-40	21,077.0	65.3%	65.3%
0-60	30,159.9	93.4%	93.4%
60-90	2,032.7	6.3%	6.3%
70-100	651.9	2%	2%
90-120	23.2	0.1%	0.1%
0-90	32,192.6	99.7%	99.7%
90-180	100.8	0.3%	0.3%
0-180	32,293.5	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	1,515.8	4.7%	90-100	7.9	0%
10-20	4,472.3	13.8%	100-110	7.0	0%
20-30	6,979.7	21.6%	110-120	8.3	0%
30-40	8,109.2	25.1%	120-130	10.8	0%
40-50	6,067.4	18.8%	130-140	15.2	0%
50-60	3,015.5	9.3%	140-150	18.5	0.1%
60-70	1,388.7	4.3%	150-160	17.0	0.1%
70-80	545.8	1.7%	160-170	11.9	0%
80-90	98.2	0.3%	170-180	4.2	0%

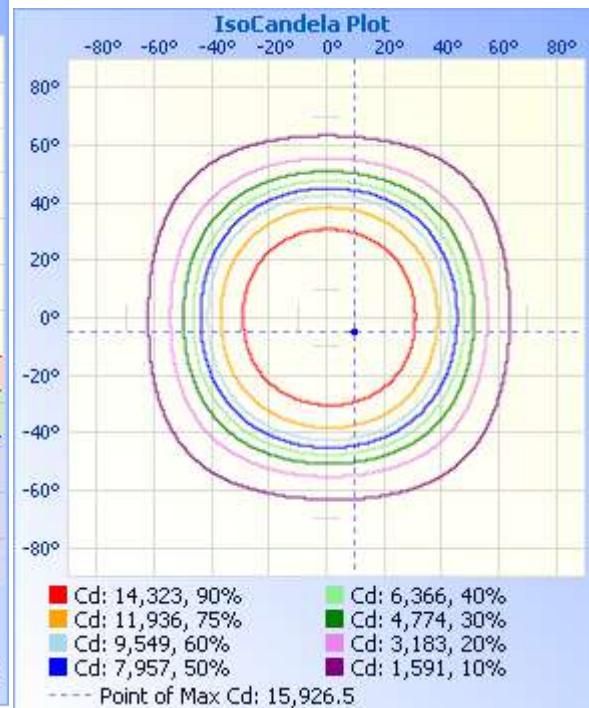
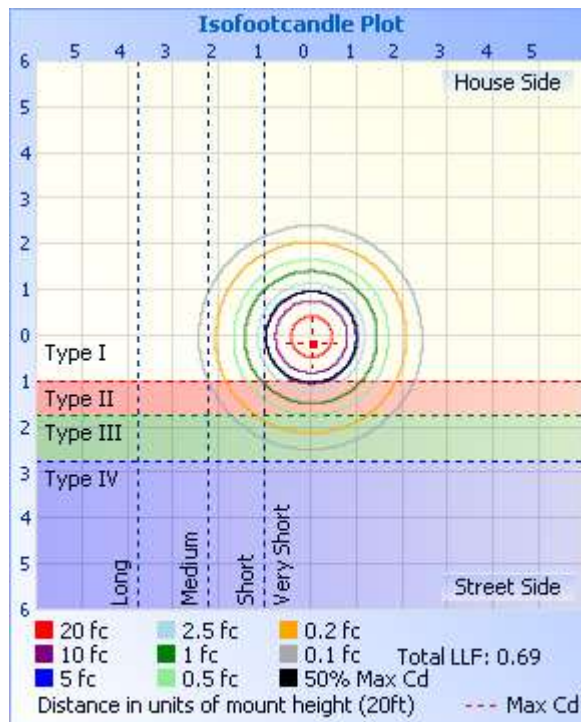
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	54.9 fc	33.1 ft	33.3 ft
34.0ft	13.7 fc	66.2 ft	66.5 ft
51.0ft	6.10 fc	99.2 ft	99.8 ft
68.0ft	3.43 fc	132.3 ft	133.0 ft
85.0ft	2.19 fc	165.4 ft	166.3 ft
102.0ft	1.52 fc	198.5 ft	199.5 ft

Vert. Spread: 88.4°
Horiz. Spread: 88.7°



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	15856	15856	15856	15856	15856	15856	15856	15856	15856	15856	15856	15856	15856	15856	15856	15856	15856
1	15861	15857	15859	15846	15859	15859	15862	15845	15855	15868	15855	15880	15848	15851	15851	15855	15861
2	15858	15856	15856	15850	15860	15864	15867	15845	15861	15864	15855	15875	15855	15860	15861	15852	15858
3	15864	15864	15865	15856	15871	15866	15874	15856	15868	15876	15856	15861	15856	15860	15861	15854	15864
4	15873	15868	15866	15850	15872	15868	15876	15855	15877	15868	15865	15869	15857	15872	15855	15854	15873
5	15877	15872	15869	15861	15874	15871	15878	15871	15877	15868	15866	15883	15863	15866	15857	15858	15877
6	15887	15885	15878	15867	15873	15875	15894	15869	15883	15873	15871	15885	15872	15884	15862	15860	15887
7	15900	15897	15879	15861	15872	15884	15902	15884	15891	15876	15880	15905	15879	15885	15865	15863	15900
8	15897	15907	15894	15869	15871	15880	15891	15892	15900	15887	15893	15900	15881	15905	15873	15870	15897
9	15903	15909	15890	15866	15871	15875	15898	15884	15898	15894	15892	15915	15886	15905	15872	15866	15903
10	15904	15911	15877	15867	15861	15873	15890	15870	15891	15886	15904	15927	15895	15906	15873	15880	15904
11	15909	15906	15879	15862	15852	15863	15887	15865	15881	15880	15902	15918	15892	15906	15869	15880	15909
12	15913	15909	15876	15850	15835	15847	15866	15850	15868	15869	15904	15918	15885	15906	15863	15884	15913
13	15906	15895	15853	15823	15810	15824	15850	15835	15855	15855	15892	15911	15869	15906	15860	15877	15906
14	15899	15880	15834	15811	15778	15795	15821	15805	15832	15835	15870	15881	15850	15886	15859	15880	15899
15	15878	15866	15814	15784	15762	15757	15788	15769	15795	15806	15849	15878	15842	15862	15846	15870	15878

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

16	15856	15836	15782	15726	15718	15719	15747	15724	15756	15765	15816	15847	15808	15851	15825	15846	15856
17	15821	15799	15735	15683	15672	15689	15697	15680	15701	15735	15772	15807	15778	15817	15792	15801	15821
18	15777	15759	15686	15635	15619	15642	15649	15620	15650	15685	15723	15774	15740	15781	15756	15770	15777
19	15730	15710	15639	15590	15564	15589	15592	15563	15594	15649	15677	15715	15678	15722	15712	15720	15730
20	15674	15647	15590	15532	15493	15527	15526	15499	15534	15593	15623	15645	15619	15656	15650	15663	15674
21	15600	15577	15516	15463	15430	15451	15459	15431	15469	15533	15572	15567	15539	15578	15579	15597	15600
22	15529	15509	15451	15400	15344	15367	15386	15357	15389	15450	15507	15499	15458	15507	15510	15529	15529
23	15464	15440	15360	15320	15244	15278	15286	15279	15309	15368	15423	15416	15363	15423	15438	15448	15464
24	15381	15361	15279	15240	15139	15179	15185	15177	15214	15266	15334	15320	15276	15335	15361	15357	15381
25	15293	15259	15172	15127	15024	15051	15071	15075	15106	15160	15212	15222	15175	15237	15275	15272	15293
26	15186	15164	15060	14998	14884	14936	14958	14954	14969	15026	15090	15103	15058	15118	15166	15177	15186
27	15072	15044	14924	14860	14739	14794	14803	14824	14829	14888	14948	14978	14925	15008	15043	15060	15072
28	14939	14909	14798	14706	14577	14632	14644	14675	14676	14739	14794	14825	14777	14883	14898	14920	14939
29	14786	14750	14623	14529	14395	14461	14474	14481	14508	14589	14636	14663	14612	14709	14744	14768	14786
30	14622	14576	14455	14336	14191	14233	14281	14280	14320	14405	14443	14473	14428	14544	14564	14575	14622
31	14428	14377	14247	14120	13971	14013	14059	14066	14115	14207	14235	14241	14208	14307	14374	14374	14428
32	14179	14123	14020	13898	13698	13768	13822	13833	13866	13961	14011	14012	13986	14084	14164	14166	14179
33	13933	13870	13762	13622	13421	13479	13524	13570	13612	13707	13744	13754	13737	13835	13899	13948	13933
34	13665	13590	13469	13321	13118	13189	13225	13267	13333	13430	13469	13482	13470	13551	13653	13660	13665

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

35	13376	13294	13158	12999	12788	12811	12896	12932	13012	13117	13160	13170	13175	13276	13324	13364	13376
36	13035	12983	12794	12651	12395	12450	12542	12578	12682	12785	12805	12808	12836	12958	13003	13034	13035
37	12698	12607	12429	12272	12000	12061	12143	12191	12267	12372	12426	12441	12477	12626	12650	12672	12698
38	12319	12222	12023	11857	11576	11647	11666	11719	11856	11963	12003	12025	12065	12245	12277	12287	12319
39	11852	11758	11562	11356	11074	11162	11182	11222	11373	11490	11513	11528	11589	11791	11849	11854	11852
40	11408	11222	11033	10836	10529	10581	10632	10684	10843	10958	10981	10969	11062	11249	11359	11381	11408
41	10829	10638	10439	10279	9941	9976	10031	10088	10254	10367	10325	10314	10514	10652	10742	10797	10829
42	10209	10009	9834	9639	9320	9341	9392	9472	9644	9734	9689	9704	9875	10040	10144	10213	10209
43	9524	9372	9202	8972	8654	8721	8747	8790	8971	9048	9051	9104	9282	9354	9518	9550	9524
44	8881	8735	8556	8369	8035	8029	8116	8194	8362	8434	8442	8492	8659	8724	8844	8918	8881
45	8273	8093	7911	7735	7390	7427	7496	7579	7750	7809	7755	7828	8023	8082	8194	8278	8273
46	7668	7509	7241	7116	6820	6838	6898	6982	7142	7136	7170	7221	7394	7474	7548	7620	7668
47	7071	6899	6684	6539	6281	6312	6336	6407	6508	6567	6609	6643	6810	6912	6975	7043	7071
48	6447	6380	6118	5993	5759	5810	5756	5813	5966	6026	6074	6098	6203	6335	6384	6421	6447
49	5904	5825	5620	5483	5286	5296	5281	5316	5463	5514	5564	5595	5689	5816	5860	5898	5904
50	5389	5346	5186	5026	4814	4864	4832	4872	4947	5002	5051	5086	5199	5327	5345	5400	5389
51	4926	4891	4694	4607	4417	4451	4409	4454	4511	4550	4621	4652	4738	4857	4866	4903	4926
52	4508	4455	4308	4227	4061	4087	4005	4088	4125	4154	4229	4289	4342	4453	4446	4432	4508
53	4132	4068	3964	3879	3717	3756	3677	3707	3753	3793	3875	3922	4001	4095	4076	4050	4132

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

54	3748	3728	3653	3533	3405	3435	3391	3400	3427	3482	3578	3601	3654	3772	3698	3713	3748
55	3430	3428	3335	3242	3091	3168	3122	3114	3110	3174	3278	3281	3356	3442	3398	3402	3430
56	3147	3145	3093	2975	2832	2922	2863	2853	2852	2921	3035	3013	3070	3184	3123	3109	3147
57	2883	2894	2827	2736	2595	2686	2633	2598	2618	2687	2805	2770	2812	2908	2888	2855	2883
58	2622	2643	2604	2486	2369	2462	2429	2375	2390	2471	2590	2544	2580	2676	2666	2603	2622
59	2398	2431	2391	2278	2168	2245	2232	2178	2190	2282	2374	2314	2361	2462	2458	2398	2398
60	2196	2237	2200	2089	1962	2053	2053	1991	1999	2098	2183	2117	2140	2261	2271	2211	2196
61	2004	2041	2021	1912	1801	1883	1871	1824	1819	1920	2014	1943	1948	2074	2077	2030	2004
62	1838	1882	1843	1752	1655	1709	1717	1655	1680	1767	1846	1785	1782	1884	1914	1861	1838
63	1676	1714	1692	1596	1507	1561	1569	1519	1549	1618	1677	1623	1637	1729	1753	1693	1676
64	1540	1554	1551	1470	1389	1424	1426	1398	1432	1475	1528	1494	1492	1582	1590	1556	1540
65	1419	1411	1400	1352	1283	1296	1292	1280	1311	1332	1392	1374	1379	1436	1451	1431	1419
66	1307	1291	1274	1242	1173	1177	1160	1175	1210	1210	1257	1257	1274	1305	1317	1310	1307
67	1200	1169	1153	1142	1084	1068	1049	1067	1113	1097	1138	1163	1181	1187	1189	1198	1200
68	1094	1051	1041	1054	987	961	948	980	1022	1002	1015	1062	1084	1074	1072	1107	1094
69	1006	959	945	961	907	872	852	892	933	898	918	970	997	978	969	1006	1006
70	911	854	850	879	827	793	767	818	851	816	821	890	908	879	871	923	911
71	831	775	765	801	754	706	694	737	773	736	743	813	830	799	782	839	831
72	757	698	692	728	681	636	619	668	702	661	658	727	757	721	707	764	757

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

73	684	626	614	662	607	571	561	599	627	591	593	655	689	646	635	685	684
74	615	557	559	592	543	509	495	535	562	529	533	589	618	582	569	616	615
75	547	504	491	528	489	448	444	473	505	471	469	523	551	517	509	555	547
76	484	439	431	463	427	393	394	420	444	415	417	462	483	451	451	490	484
77	423	387	383	412	377	347	352	370	391	372	370	405	423	404	398	425	423
78	374	342	336	361	324	300	301	331	336	315	320	358	376	357	352	378	374
79	323	294	287	312	274	255	257	276	289	269	278	310	322	308	308	325	323
80	281	256	243	265	233	214	218	235	247	231	240	265	280	261	261	276	281
81	238	213	205	223	191	179	181	201	206	190	201	219	235	220	224	237	238
82	192	177	171	186	149	146	148	162	164	159	165	185	191	179	187	194	192
83	151	141	138	145	117	114	116	125	128	125	131	148	152	146	150	159	151
84	118	109	105	113	84	76	86	91	94	95	103	111	112	115	117	121	118
85	81	71	69	75	54	49	49	59	59	67	66	74	82	85	88	85	81
86	53	51	42	47	20	28	28	35	30	40	40	43	56	59	58	56	53
87	20	26	20	24	0	12	16	14	16	19	23	29	20	21	25	26	20
88	11	11	16	18	0	10	8	11	9	7	13	10	8	15	18	18	11
89	10	0	11	14	0	7	12	11	0	13	12	8	0	10	7	11	10
90	10	11	8	14	0	0	9	8	10	11	10	14	0	11	10	11	10
91	11	8	9	14	0	7	9	0	9	9	8	11	0	0	11	9	11

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

92	8	10	8	15	0	0	0	11	10	9	10	10	0	0	9	10	8
93	9	13	10	14	0	0	9	10	9	10	9	12	0	10	10	11	9
94	10	10	11	11	0	0	9	9	9	11	12	9	0	8	11	9	10
95	10	0	13	13	0	0	0	8	8	8	7	10	0	8	10	10	10
96	11	7	10	14	0	0	7	7	0	10	13	11	0	8	10	7	11
97	7	12	11	12	0	0	0	12	8	0	12	11	0	7	8	12	7
98	10	10	8	10	0	0	7	9	8	12	9	10	0	0	0	9	10
99	7	8	10	13	0	0	0	9	10	11	11	10	0	0	8	10	7
100	8	8	10	14	0	0	0	8	10	10	13	13	0	8	9	0	8
101	11	12	0	14	0	0	7	10	11	9	10	13	0	7	11	8	11
102	7	10	9	13	0	0	0	9	0	12	12	13	0	0	9	0	7
103	10	13	0	12	0	0	9	10	0	12	9	9	0	7	7	11	10
104	11	11	9	11	0	0	10	10	9	10	12	8	0	0	12	10	11
105	0	10	10	14	0	0	0	8	0	0	0	12	0	9	10	9	0
106	10	11	8	8	0	0	0	0	0	10	13	0	0	0	0	13	10
107	0	9	0	10	0	0	0	11	8	7	12	8	0	0	10	11	0
108	9	10	12	16	0	0	7	10	8	12	0	12	0	0	9	10	9
109	10	12	10	15	0	0	9	10	8	14	10	10	0	0	11	9	10
110	10	12	11	17	0	0	8	9	7	11	10	9	0	8	7	11	10

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

111	10	14	0	13	0	0	0	9	10	9	12	12	0	0	8	10	10
112	10	14	10	14	0	0	0	10	9	12	11	11	0	9	13	11	10
113	7	13	10	17	0	0	9	8	11	10	12	8	0	9	10	11	7
114	13	9	11	10	0	8	0	10	8	13	11	12	0	8	0	11	13
115	12	9	0	18	0	0	7	9	0	14	11	8	0	9	10	12	12
116	0	12	11	14	0	0	13	14	8	10	9	14	0	9	9	11	0
117	8	9	12	16	0	0	0	8	11	12	9	14	0	10	14	9	8
118	8	12	12	17	0	10	0	13	0	12	13	13	0	12	11	11	8
119	8	11	9	16	0	0	12	13	10	14	10	15	0	10	12	15	8
120	11	11	11	18	0	8	9	12	11	16	10	12	0	10	15	15	11
121	10	12	12	13	0	8	10	15	11	13	9	11	0	9	13	13	10
122	14	12	12	16	0	7	8	13	13	14	12	14	0	10	11	11	14
123	14	14	9	14	0	11	12	13	10	15	13	15	0	10	16	10	14
124	9	13	15	16	0	12	11	13	10	14	16	13	0	10	13	8	9
125	10	10	15	20	0	9	15	10	14	17	13	17	0	0	11	18	10
126	12	12	13	17	0	9	10	11	18	15	19	14	11	14	17	13	12
127	14	14	15	17	0	7	14	16	11	18	16	18	0	14	14	16	14
128	15	17	16	20	8	10	12	17	15	17	14	16	11	13	16	18	15
129	17	18	14	22	7	9	12	17	17	19	16	20	8	14	17	12	17

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

130	16	15	16	20	0	10	14	15	15	20	17	23	11	17	15	18	16
131	17	20	18	20	0	13	19	18	18	15	22	20	10	15	20	16	17
132	18	16	13	25	10	12	16	19	19	20	17	21	8	19	19	17	18
133	18	18	22	26	9	14	15	19	19	25	17	23	13	19	19	21	18
134	20	20	19	23	11	11	16	20	20	23	24	20	9	16	21	21	20
135	20	19	21	17	7	14	19	24	20	23	22	22	13	21	21	20	20
136	19	23	22	18	12	18	19	23	25	19	20	25	14	20	24	23	19
137	22	25	21	26	11	18	20	24	22	22	25	29	18	20	15	27	22
138	24	29	21	20	13	17	17	30	25	27	29	22	16	18	26	21	24
139	25	23	24	29	17	16	21	27	29	31	30	29	19	22	26	28	25
140	24	18	26	24	11	21	26	28	30	29	30	28	19	28	25	21	24
141	27	27	24	27	12	22	26	26	20	25	31	30	23	27	27	24	27
142	30	27	30	32	13	26	28	27	25	26	34	35	22	30	32	29	30
143	25	29	33	37	18	23	26	31	32	31	33	31	20	28	23	27	25
144	28	34	33	29	20	24	31	32	28	32	34	34	23	32	31	31	28
145	34	31	32	30	18	23	27	32	24	31	33	36	25	27	31	29	34
146	32	37	27	36	21	22	32	36	31	35	32	36	25	30	35	26	32
147	28	29	33	35	19	23	32	31	28	31	36	37	25	33	30	35	28
148	33	33	34	38	23	31	34	38	37	34	38	38	29	31	31	30	33

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

149	34	36	33	41	26	31	35	38	34	28	38	39	31	30	27	35	34
150	35	38	33	42	24	30	30	34	37	33	38	32	27	29	38	35	35
151	36	39	41	40	22	31	37	35	35	38	39	41	30	38	35	28	36
152	32	40	38	39	28	32	31	36	36	39	39	31	33	39	40	38	32
153	39	40	39	44	27	34	36	41	41	34	42	33	32	35	40	34	39
154	36	41	36	40	20	29	34	40	37	36	41	35	26	37	39	40	36
155	37	39	34	42	28	33	39	33	38	37	42	42	27	38	42	42	37
156	41	31	44	41	26	25	42	45	39	40	30	37	33	37	39	41	41
157	36	33	34	44	31	34	41	38	37	40	41	43	33	44	41	25	36
158	38	43	46	34	31	27	40	43	39	44	41	41	30	39	46	42	38
159	43	38	38	44	31	32	33	39	42	39	43	45	35	41	42	46	43
160	41	42	40	40	31	41	32	44	31	44	46	47	37	38	42	33	41
161	36	44	43	48	32	38	40	46	40	42	47	40	34	42	44	42	36
162	42	40	43	39	35	42	39	42	43	39	48	42	35	38	42	51	42
163	41	45	47	46	29	37	42	49	39	47	36	49	31	47	39	45	41
164	43	33	46	42	32	39	44	43	46	46	43	42	31	42	45	44	43
165	46	38	46	39	29	43	45	47	44	45	39	44	36	42	40	45	46
166	38	47	47	51	35	41	40	36	45	44	49	34	30	45	39	46	38
167	43	32	45	48	35	34	44	50	46	50	52	46	37	44	47	45	43

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

168	46	47	43	50	36	40	42	49	50	48	53	47	37	40	47	51	46
169	45	41	49	52	33	42	50	40	45	43	38	49	39	49	40	46	45
170	46	47	44	46	33	43	47	47	51	31	34	51	38	49	49	48	46
171	48	45	44	47	37	45	49	49	46	50	51	52	36	44	51	38	48
172	41	47	48	44	37	43	45	48	47	43	47	47	34	45	48	43	41
173	45	49	47	48	41	41	38	50	41	44	52	50	38	39	41	48	45
174	43	31	49	50	34	42	51	50	44	44	54	48	38	42	46	44	43
175	48	45	44	51	37	43	46	50	41	43	45	50	36	47	47	41	48
176	37	48	48	48	34	38	40	40	49	52	49	52	37	45	45	51	37
177	42	43	48	46	38	43	40	46	51	39	52	49	38	42	45	40	42
178	40	45	44	48	39	34	45	45	41	44	43	48	38	45	49	43	40
179	44	35	48	47	32	40	44	47	50	42	47	49	34	41	45	43	44
180	43	50	46	49	26	36	37	43	50	49	49	46	41	45	37	41	43

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		24.9	26.2	25.2	26.5	26.9	24.4	25.8	24.8	26.1	26.4
	3H	25.6	26.8	26.0	27.1	27.5	25.1	26.3	25.5	26.6	27.0
	4H	25.8	26.9	26.2	27.3	27.6	25.3	26.4	25.7	26.8	27.1
	6H	25.9	26.9	26.3	27.3	27.7	25.4	26.4	25.8	26.8	27.2
	8H	25.9	26.9	26.3	27.3	27.7	25.4	26.3	25.8	26.7	27.1
	12H	25.9	26.8	26.3	27.2	27.6	25.3	26.3	25.8	26.7	27.1
4H 2H		25.1	26.2	25.5	26.6	27.0	24.6	25.8	25.0	26.1	26.5
	3H	26.0	26.9	26.4	27.3	27.7	25.5	26.4	25.9	26.8	27.2
	4H	26.2	27.1	26.7	27.5	27.9	25.8	26.6	26.2	27.0	27.4
	6H	26.4	27.1	26.9	27.6	28.0	25.9	26.6	26.4	27.0	27.5
	8H	26.4	27.1	26.9	27.5	28.0	25.9	26.6	26.4	27.0	27.5
	12H	26.4	27.0	26.9	27.5	28.0	25.9	26.5	26.4	26.9	27.4
8H 4H		26.3	26.9	26.7	27.4	27.8	25.8	26.4	26.2	26.9	27.3
	6H	26.5	27.0	27.0	27.5	28.0	26.0	26.5	26.5	27.0	27.5
	8H	26.5	27.0	27.0	27.5	28.0	26.0	26.5	26.5	27.0	27.5
	12H	26.6	27.0	27.1	27.5	28.0	26.0	26.4	26.5	26.9	27.5
12H 4H		26.3	26.8	26.7	27.3	27.8	25.8	26.3	26.2	26.8	27.3
	6H	26.5	26.9	27.0	27.4	28.0	25.9	26.4	26.5	26.9	27.4
	8H	26.5	27.0	27.0	27.5	28.0	26.0	26.4	26.5	26.9	27.5

Maximum UGR = 28.0

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 (240W,40K) 40WD		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220900	120.0	60	1.938	231.81	0.997	2.2
5E-D2	277.0	60	0.868	226.44	0.942	9.6
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

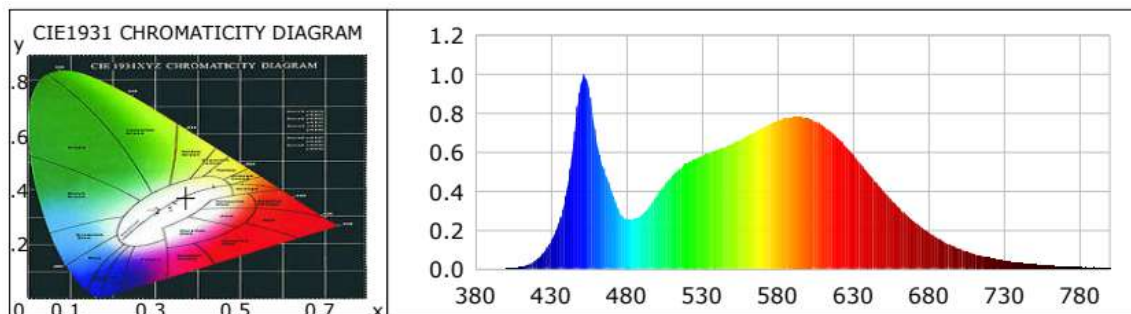
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	14
Frequency (Hz)	60	R2	90	R10	76
CCT (K)	4233	R3	94	R11	81
Duv	-0.0012	R4	83	R12	61
Chromaticity (x, y)	x=0.3700 y=0.3674	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2219 v'=0.4958	R6	86	R14	97
Color Rendering Index (CRI)	84	R7	86	R15	78
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)	35114.6	34769.9	>=10000(-10%)
Luminous Efficacy (lm/W)	151.48	153.55	Premium: >= 135(-3%)
Most worst Luminous/Highest Watts	149.99		

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	0.3048	535	0.5633	660.3935	690	0.2445	286.6586
385	0.0003	0.3449	540	0.5788	678.4744	695	0.2142	251.1199
390	0.0004	0.4609	545	0.5944	696.8062	700	0.1860	218.0713
395	0.0003	0.4045	550	0.6125	718.0053	705	0.1623	190.2643
400	0.0011	1.2666	555	0.6251	732.8457	710	0.1398	163.8340
405	0.0036	4.2232	560	0.6430	753.7770	715	0.1209	141.7403
410	0.0097	11.3601	565	0.6623	776.4520	720	0.1043	122.2194
415	0.0222	26.0007	570	0.6848	802.8369	725	0.0893	104.7282
420	0.0434	50.8966	575	0.7057	827.2570	730	0.0766	89.7932
425	0.0808	94.7237	580	0.7246	849.4019	735	0.0654	76.6246
430	0.1386	162.4592	585	0.7464	875.0147	740	0.0569	66.7236
435	0.2303	269.9812	590	0.7626	894.0023	745	0.0492	57.7179
440	0.3769	441.8969	595	0.7720	905.0390	750	0.0412	48.3146
445	0.6453	756.4842	600	0.7814	916.0567	755	0.0346	40.5862
450	0.9523	1116.4264	605	0.7805	914.9806	760	0.0309	36.2337
455	0.9379	1099.4627	610	0.7754	908.9635	765	0.0260	30.4865
460	0.6685	783.7279	615	0.7584	889.1295	770	0.0227	26.5611
465	0.5141	602.7153	620	0.7370	864.0044	775	0.0182	21.3747
470	0.4025	471.8231	625	0.7089	831.0257	780	0.0174	20.3419
475	0.3007	352.4846	630	0.6713	786.9521	785	0.0128	14.9522
480	0.2553	299.2754	635	0.6296	738.0621	790	0.0119	13.9727
485	0.2556	299.6156	640	0.5859	686.8596	795	0.0096	11.1971
490	0.2768	324.4416	645	0.5401	633.2049	800	0.0088	10.2909
495	0.3193	374.2722	650	0.4915	576.1371			
500	0.3739	438.3118	655	0.4449	521.5670			
505	0.4263	499.8102	660	0.3999	468.7815			
510	0.4761	558.1777	665	0.3570	418.4931			
515	0.5131	601.5319	670	0.3172	371.8277			
520	0.5394	632.3904	675	0.2791	327.1742			
525	0.5633	660.3935	680	0.2445	286.6586			
530	0.5788	678.4744	685	0.2142	251.1199			

TM30

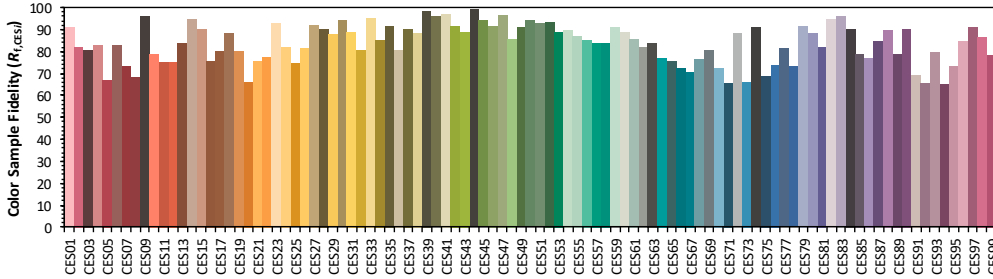
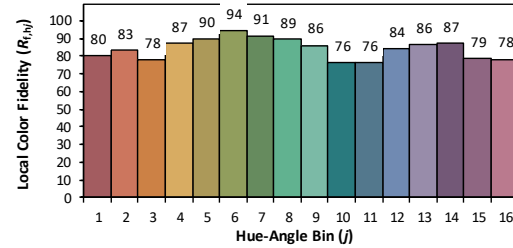
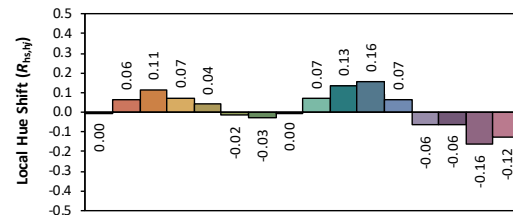
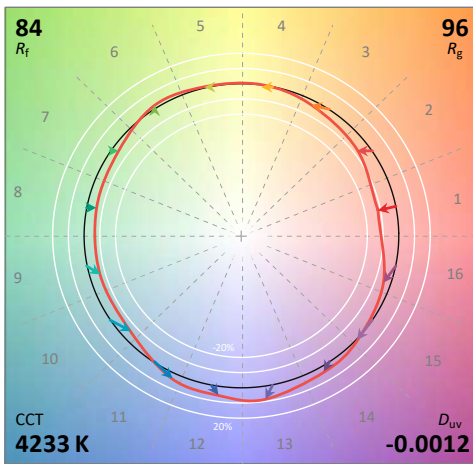
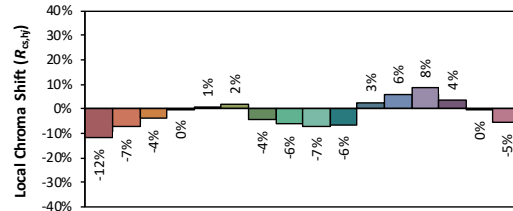
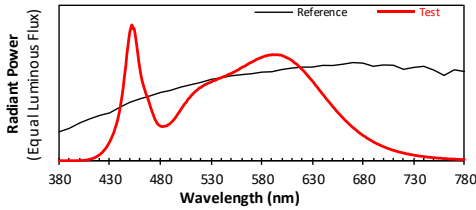
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RA35000H1

Manufacturer: IKIO LED LIGHTING

Date: 2022/9/27

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



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

x 0.3700
 y 0.3674
 u' 0.2219
 v' 0.4958

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 (240W,50K) 50WD		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220900	120.0	60	2.004	240.22	0.999	1.96
5E-D2	277.0	60	0.899	235.10	0.944	9.4
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

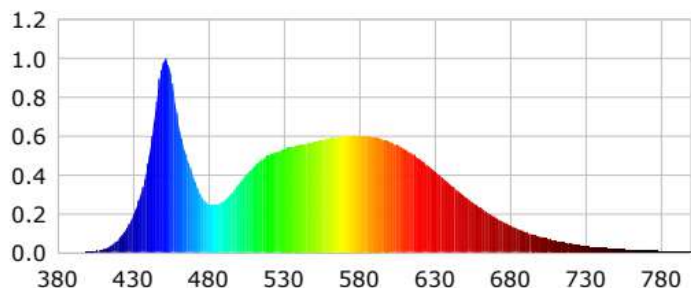
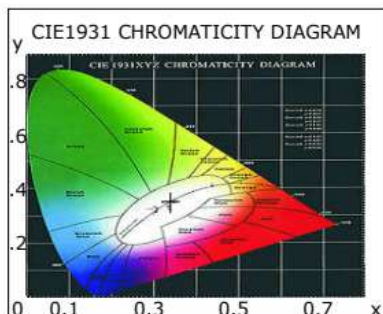
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	14
Frequency (Hz)	60	R2	88	R10	71
CCT (K)	5218	R3	91	R11	82
Duv	0.0007	R4	84	R12	62
Chromaticity (x, y)	x=0.3393 y=0.3483	R5	83	R13	84
Chromaticity (u', v')	u(u')=0.2088 v'=0.4822	R6	83	R14	95
Color Rendering Index (CRI)	84	R7	87	R15	78
R9	14	R8	70	--	--
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)	32374.4	32192.2	>=10000(-10%)
Luminous Efficacy (lm/W)	134.77	136.93	Premium: >= 135(-3%)
Most worst Luminous/Highest Watts	134.01		

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	0.4424	535	0.5172	656.4241	690	0.1805	229.0814
385	0.0003	0.3787	540	0.5294	671.8341	695	0.1585	201.1159
390	0.0005	0.6147	545	0.5412	686.8476	700	0.1386	175.9466
395	0.0008	1.0167	550	0.5522	700.8365	705	0.1215	154.2227
400	0.0021	2.7143	555	0.5597	710.2800	710	0.1054	133.7798
405	0.0056	7.0854	560	0.5678	720.5708	715	0.0917	116.4246
410	0.0148	18.7757	565	0.5759	730.8319	720	0.0786	99.7903
415	0.0327	41.5364	570	0.5865	744.3307	725	0.0682	86.5023
420	0.0619	78.6112	575	0.5926	751.9971	730	0.0594	75.4096
425	0.1111	141.0350	580	0.5965	756.9892	735	0.0505	64.1280
430	0.1844	234.0605	585	0.6026	764.8103	740	0.0440	55.8883
435	0.2942	373.4136	590	0.6025	764.6335	745	0.0379	48.1030
440	0.4609	584.9396	595	0.5972	757.9536	750	0.0326	41.4179
445	0.7276	923.4287	600	0.5941	753.9790	755	0.0278	35.2266
450	0.9778	1240.9545	605	0.5839	740.9853	760	0.0241	30.5761
455	0.9248	1173.6324	610	0.5716	725.4107	765	0.0206	26.1834
460	0.6717	852.4046	615	0.5535	702.3817	770	0.0168	21.3038
465	0.5077	644.3426	620	0.5326	675.9510	775	0.0160	20.3019
470	0.3888	493.3943	625	0.5090	645.9321	780	0.0132	16.7332
475	0.2938	372.8408	630	0.4802	609.4063	785	0.0117	14.8083
480	0.2483	315.0919	635	0.4501	571.2304	790	0.0098	12.3791
485	0.2454	311.4927	640	0.4175	529.8972	795	0.0076	9.7069
490	0.2637	334.7178	645	0.3845	487.9444	800	0.0065	8.2385
495	0.3030	384.5113	650	0.3514	445.8917			
500	0.3514	445.9237	655	0.3186	404.3221			
505	0.3980	505.0430	660	0.2880	365.5475			
510	0.4419	560.8282	665	0.2574	326.6496			
515	0.4745	602.2225	670	0.2300	291.8968			
520	0.4980	631.9858	675	0.2039	258.7356			
525	0.5172	656.4241	680	0.1805	229.0814			
530	0.5294	671.8341	685	0.1585	201.1159			

TM30

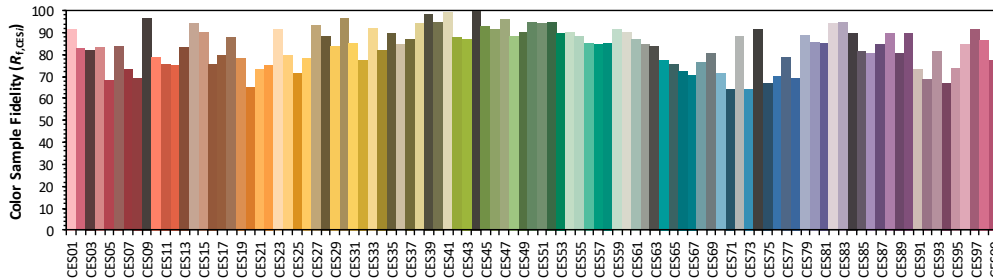
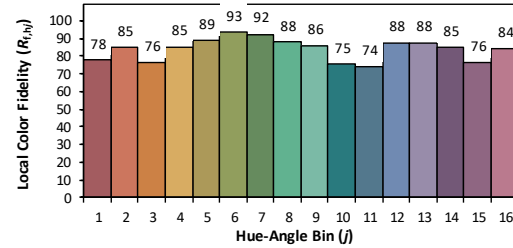
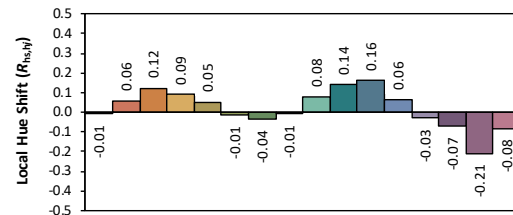
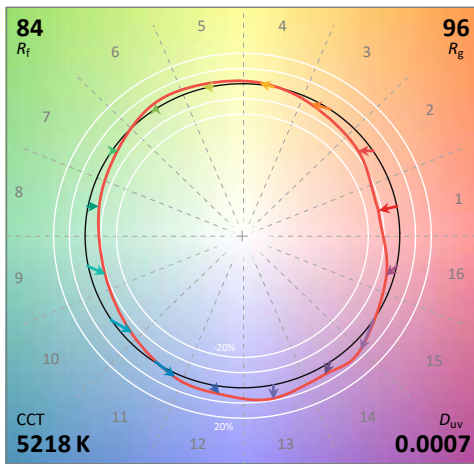
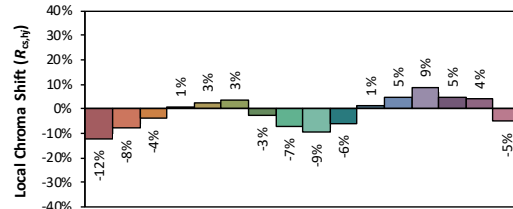
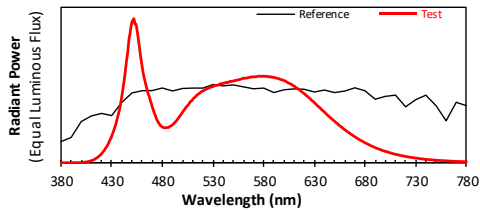
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RA35000H1

Manufacturer: IKIO LED LIGHTING

Date: 2022/9/27

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



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

x 0.3393
 y 0.3483
 u' 0.2088
 v' 0.4822

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.

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 *******