

## 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-35/40/50K-BL (100W)

Representative (Tested) Model:

IK-UFHB-240W-35/40/50K-BL (100W,35K) 35WD

IK-UFHB-240W-35/40/50K-BL (100W,40K) 40WD

IK-UFHB-240W-35/40/50K-BL (100W,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-35/40/50K-BL (100W)	
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	100W(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-A1	
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"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2017 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	BL-QP-033

## 1.3 Test Methods

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

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  horizontal intervals. 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-100WL1B1T2A1-abc35WD:1.064

AST-HB18B-100WL1B1T2A1-abc40WD:1.065

AST-HB18B-100WL1B1T2A1-abc50WD:1.066

### 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-35/40/50K-BL (100W,35K) 35 WD		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220900	120.0	60	0.853	102.00	0.997	2.78
5E-A1	277.0	60	0.394	100.85	0.925	6.36
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

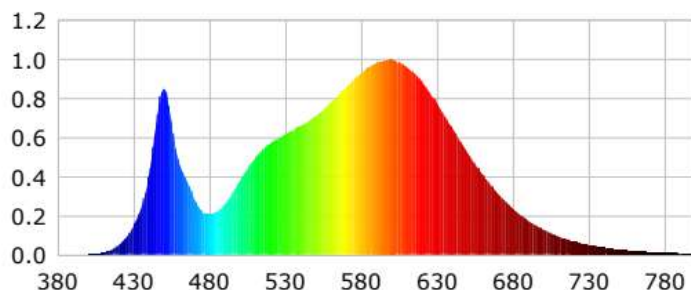
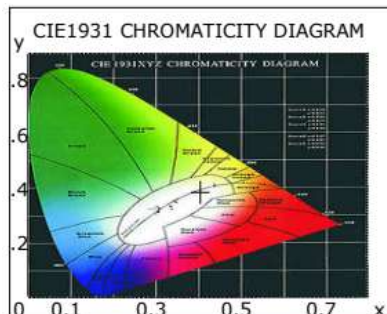
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	3
Frequency (Hz)	60	R2	88	R10	73
CCT (K)	3507	R3	95	R11	80
Duv	-0.0006	R4	81	R12	65
Chromaticity (x, y)	x=0.4043 y=0.3890	R5	80	R13	82
Chromaticity (u', v')	u(u')=0.2358 v'=0.5104	R6	85	R14	97
Color Rendering Index (CRI)	82	R7	84	R15	73
R9	3	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)	13637.7	13612.2	>=10000(-10%)
Luminous Efficacy (lm/W)	133.70	134.97	Premium: >= 135(-3%)
Most worst Luminous/Highest	133.45		
Zonal lumens in the 20-50 °zone (%)	65.40	--	>=30(-10%)
Beam Angle ( °)	85.6	--	--
Center Beam Candle Power (cd)	6669	--	--

## 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	0.0874	535	0.5941	147.1170	690	0.3127	77.4221
385	0.0003	0.0808	540	0.6158	152.4884	695	0.2732	67.6357
390	0.0002	0.0489	545	0.6366	157.6280	700	0.2362	58.4873
395	0.0005	0.1336	550	0.6602	163.4738	705	0.2036	50.4121
400	0.0017	0.4142	555	0.6822	168.9277	710	0.1745	43.1966
405	0.0041	1.0202	560	0.7097	175.7239	715	0.1502	37.1941
410	0.0101	2.5059	565	0.7424	183.8362	720	0.1280	31.6975
415	0.0238	5.8930	570	0.7804	193.2323	725	0.1093	27.0606
420	0.0474	11.7385	575	0.8179	202.5294	730	0.0944	23.3729
425	0.0861	21.3141	580	0.8557	211.8721	735	0.0803	19.8827
430	0.1465	36.2847	585	0.8979	222.3404	740	0.0685	16.9515
435	0.2389	59.1543	590	0.9332	231.0751	745	0.0576	14.2599
440	0.3982	98.5932	595	0.9578	237.1669	750	0.0493	12.1994
445	0.6703	165.9643	600	0.9846	243.8088	755	0.0414	10.2409
450	0.8528	211.1713	605	0.9961	246.6415	760	0.0359	8.8923
455	0.6841	169.3910	610	0.9989	247.3503	765	0.0310	7.6834
460	0.4738	117.3133	615	0.9859	244.1150	770	0.0266	6.5835
465	0.3841	95.1062	620	0.9629	238.4244	775	0.0227	5.6191
470	0.2890	71.5567	625	0.9313	230.5920	780	0.0192	4.7629
475	0.2233	55.2824	630	0.8859	219.3701	785	0.0163	4.0282
480	0.2075	51.3794	635	0.8338	206.4519	790	0.0137	3.3918
485	0.2222	55.0136	640	0.7736	191.5645	795	0.0119	2.9510
490	0.2555	63.2732	645	0.7119	176.2776	800	0.0093	2.3112
495	0.3127	77.4408	650	0.6483	160.5352			
500	0.3782	93.6445	655	0.5831	144.3815			
505	0.4389	108.6737	660	0.5238	129.6999			
510	0.4947	122.4961	665	0.4640	114.8919			
515	0.5377	133.1325	670	0.4088	101.2182			
520	0.5679	140.6279	675	0.3592	88.9400			
525	0.5941	147.1170	680	0.3127	77.4221			
530	0.6158	152.4884	685	0.2732	67.6357			



**TM30**

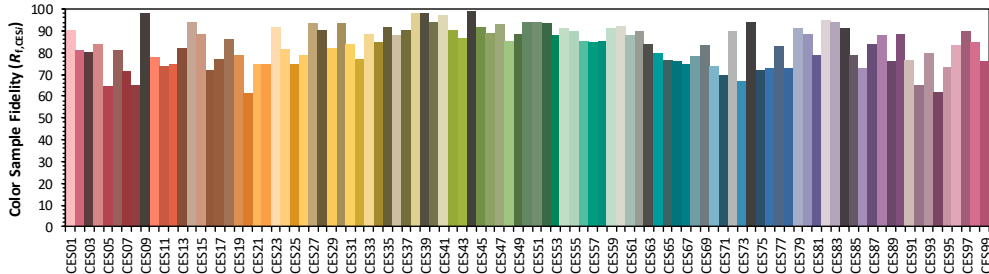
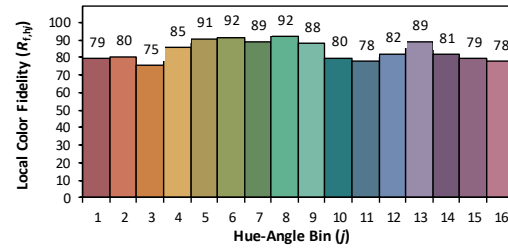
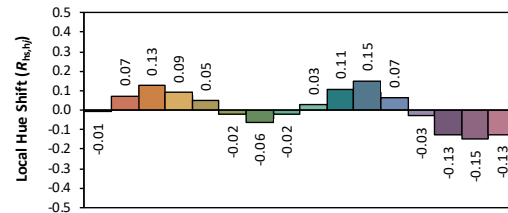
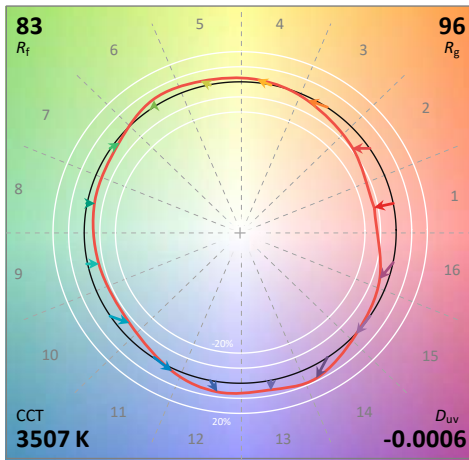
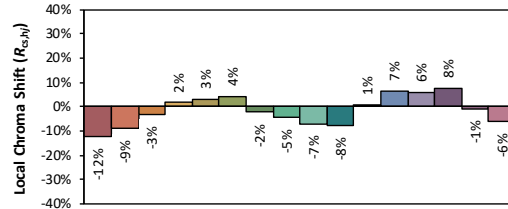
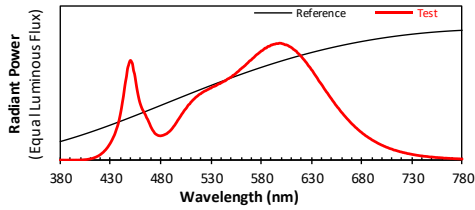
**ANSI/IES TM-30-18 Color Rendition Report**

Source: L128-XX80RA35000H1

Manufacturer: IKIO LED LIGHTING

Date: 2022/9/27

Model: IK-UFHB-240W-35/40/50K-BL (100W, 35K) 35WD



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

$x$  0.4043  
 $y$  0.3890  
 $u'$  0.2358  
 $v'$  0.5104

CIE 13.3-1995  
(CRI)  
 $R_a$  82  
 $R_9$  3

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

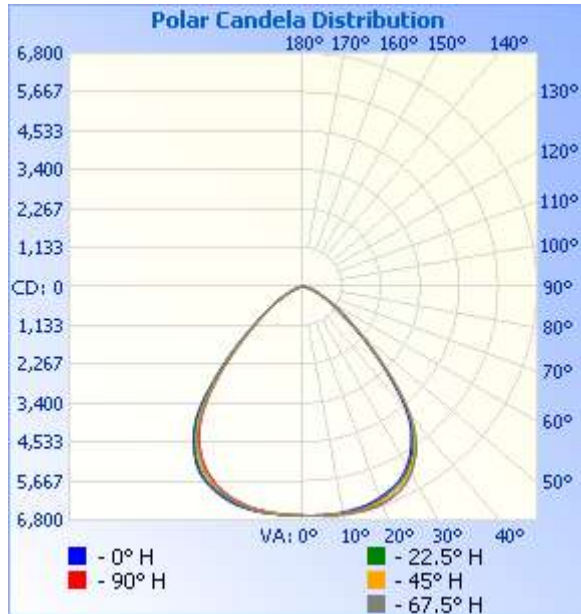
Zone	Lumens	% Lamp	% Luminaire
0-30	5,465.5	40.1%	40.1%
0-40	8,875.1	65.1%	65.1%
0-60	12,726.6	93.3%	93.3%
60-90	843.6	6.2%	6.2%
70-100	269.9	2%	2%
90-120	18.5	0.1%	0.1%
0-90	13,570.2	99.5%	99.5%
90-180	65.5	0.5%	0.5%
0-180	13,635.7	100%	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	637.6	4.7%	90-100	6.5	0%
10-20	1,883.9	13.8%	100-110	6.1	0%
20-30	2,943.9	21.6%	110-120	6.0	0%
30-40	3,409.6	25.0%	120-130	7.9	0.1%
40-50	2,560.3	18.8%	130-140	9.9	0.1%
50-60	1,291.3	9.5%	140-150	10.8	0.1%
60-70	580.2	4.3%	150-160	9.6	0.1%
70-80	223.7	1.6%	160-170	6.5	0%
80-90	39.7	0.3%	170-180	2.3	0%



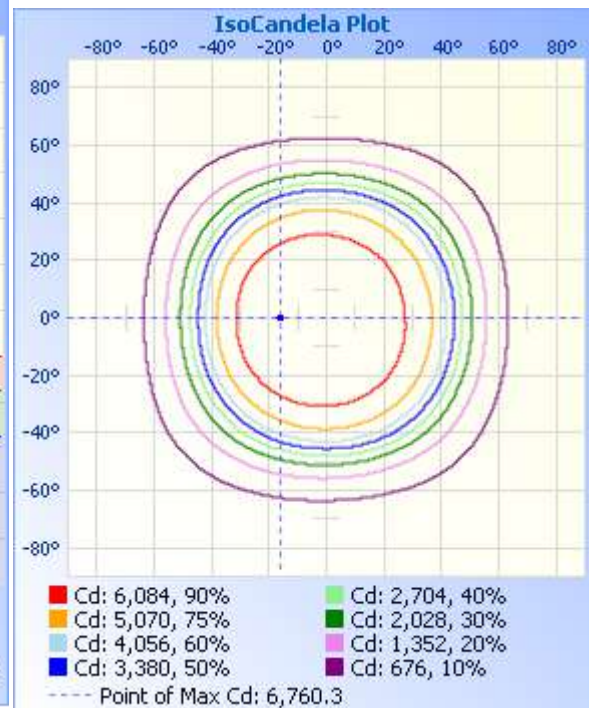
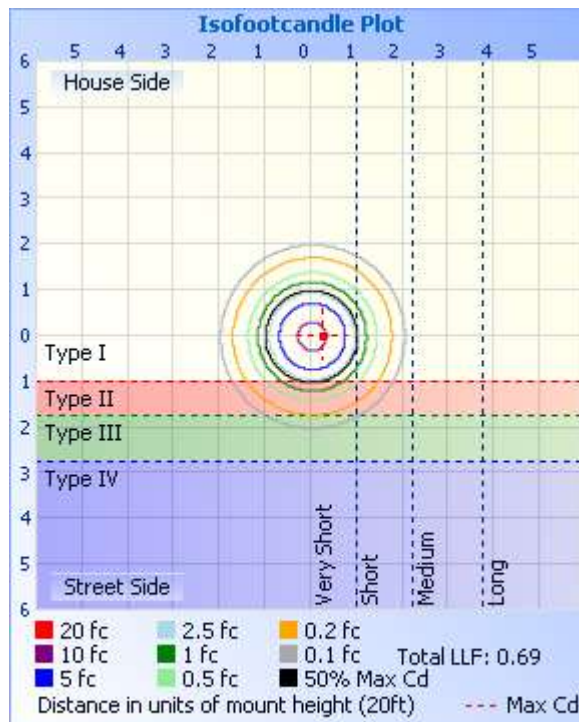
## Photometric Data



**Illuminance at a Distance**

	Center Beam fc	Beam Width
17.0ft	23.1 fc	31.5 ft 33.5 ft
34.0ft	5.77 fc	62.9 ft 67.0 ft
51.0ft	2.56 fc	94.4 ft 100.6 ft
68.0ft	1.44 fc	125.9 ft 134.1 ft
85.0ft	0.92 fc	157.3 ft 167.6 ft
102.0ft	0.64 fc	188.8 ft 201.1 ft

■ Vert. Spread: 85.6°  
■ Horiz. Spread: 89.2°



**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	6669	6669	6669	6669	6669	6669	6669	6669	6669	6669	6669	6669	6669	6669	6669	6669	6669
1	6672	6684	6667	6670	6677	6675	6674	6672	6665	6675	6665	6677	6663	6669	6666	6666	6672
2	6674	6685	6677	6672	6681	6682	6681	6677	6671	6675	6660	6673	6662	6660	6665	6666	6674
3	6678	6688	6675	6685	6691	6686	6681	6672	6661	6669	6654	6676	6662	6666	6665	6667	6678
4	6677	6691	6681	6686	6685	6686	6682	6678	6667	6664	6662	6667	6656	6653	6664	6667	6677
5	6685	6692	6683	6690	6695	6690	6687	6683	6669	6673	6663	6672	6648	6660	6663	6667	6685
6	6683	6700	6691	6699	6698	6698	6692	6683	6674	6669	6659	6673	6650	6649	6663	6674	6683
7	6686	6696	6692	6705	6708	6706	6699	6686	6666	6665	6656	6672	6647	6643	6662	6678	6686
8	6681	6703	6700	6712	6709	6715	6703	6694	6678	6669	6660	6671	6639	6647	6662	6669	6681
9	6686	6706	6706	6714	6717	6710	6712	6707	6682	6678	6661	6668	6641	6644	6661	6673	6686
10	6679	6703	6717	6726	6729	6719	6716	6698	6679	6674	6657	6656	6626	6639	6659	6671	6679
11	6669	6702	6716	6726	6728	6725	6719	6710	6685	6668	6648	6654	6628	6632	6645	6658	6669
12	6669	6705	6717	6729	6738	6733	6722	6714	6682	6664	6650	6644	6614	6610	6628	6650	6669
13	6649	6692	6719	6728	6743	6741	6729	6706	6679	6662	6636	6636	6606	6607	6621	6637	6649
14	6652	6687	6714	6737	6743	6743	6734	6706	6669	6654	6623	6627	6593	6598	6616	6633	6652
15	6638	6678	6711	6739	6757	6746	6732	6706	6663	6643	6607	6610	6570	6585	6595	6619	6638

**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**

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16	6628	6668	6707	6740	6760	6749	6732	6702	6654	6625	6589	6589	6550	6566	6572	6605	6628
17	6604	6661	6699	6733	6760	6746	6730	6697	6642	6606	6577	6569	6529	6537	6554	6562	6604
18	6583	6640	6684	6735	6756	6743	6725	6681	6625	6589	6553	6546	6502	6502	6524	6549	6583
19	6561	6613	6673	6724	6746	6742	6717	6671	6607	6565	6517	6519	6478	6475	6499	6519	6561
20	6529	6593	6654	6710	6733	6732	6695	6646	6580	6541	6492	6485	6440	6448	6462	6498	6529
21	6499	6560	6632	6692	6713	6715	6692	6620	6556	6508	6462	6459	6406	6410	6434	6461	6499
22	6471	6536	6601	6668	6691	6684	6669	6594	6521	6480	6438	6425	6357	6378	6399	6426	6471
23	6441	6494	6570	6640	6657	6663	6625	6569	6496	6450	6404	6383	6319	6330	6351	6387	6441
24	6403	6460	6535	6611	6623	6628	6593	6524	6451	6413	6366	6342	6271	6289	6309	6346	6403
25	6360	6418	6490	6577	6590	6579	6555	6484	6416	6374	6316	6287	6206	6226	6262	6303	6360
26	6319	6378	6443	6526	6543	6534	6492	6434	6372	6334	6269	6214	6152	6164	6206	6250	6319
27	6258	6322	6393	6476	6486	6481	6443	6377	6316	6280	6217	6148	6089	6099	6138	6189	6258
28	6191	6266	6335	6412	6421	6419	6367	6310	6267	6216	6144	6077	6013	6023	6062	6122	6191
29	6126	6197	6264	6341	6347	6338	6306	6251	6194	6141	6055	5991	5929	5930	5974	6046	6126
30	6033	6116	6194	6262	6263	6259	6214	6156	6112	6058	5974	5901	5844	5842	5881	5956	6033
31	5946	6026	6103	6175	6164	6163	6132	6066	6021	5965	5877	5800	5749	5746	5771	5856	5946
32	5846	5926	6010	6069	6074	6070	6029	5969	5919	5862	5774	5703	5638	5638	5675	5751	5846
33	5736	5829	5899	5962	5961	5961	5924	5867	5796	5756	5664	5591	5526	5521	5562	5632	5736
34	5618	5704	5783	5846	5843	5849	5824	5746	5671	5626	5549	5474	5409	5398	5450	5508	5618

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35	5495	5583	5646	5722	5707	5701	5695	5617	5550	5491	5400	5337	5267	5272	5316	5389	5495
36	5363	5451	5503	5580	5534	5558	5537	5459	5412	5361	5260	5178	5128	5121	5172	5254	5363
37	5226	5304	5358	5427	5376	5395	5370	5310	5268	5218	5110	5011	4971	4970	5016	5100	5226
38	5050	5154	5187	5247	5193	5213	5197	5141	5108	5054	4947	4836	4799	4796	4836	4935	5050
39	4868	4963	5019	5048	4987	4997	4997	4958	4936	4848	4731	4620	4591	4605	4624	4725	4868
40	4654	4746	4798	4818	4766	4770	4774	4748	4728	4630	4515	4407	4369	4372	4406	4509	4654
41	4413	4509	4558	4569	4489	4512	4504	4481	4480	4387	4276	4174	4147	4136	4146	4277	4413
42	4124	4226	4289	4314	4215	4231	4239	4224	4218	4130	4023	3916	3900	3892	3913	4031	4124
43	3861	3959	4011	4020	3945	3958	3968	3959	3926	3879	3772	3669	3662	3637	3662	3742	3861
44	3587	3692	3740	3747	3675	3663	3691	3669	3654	3599	3489	3427	3414	3383	3404	3486	3587
45	3326	3423	3465	3475	3399	3398	3397	3403	3388	3340	3232	3158	3161	3113	3151	3209	3326
46	3075	3152	3190	3210	3145	3141	3131	3138	3131	3075	2972	2905	2913	2883	2908	2937	3075
47	2803	2898	2920	2965	2911	2902	2883	2890	2870	2821	2728	2671	2692	2670	2655	2700	2803
48	2575	2634	2680	2714	2681	2670	2642	2649	2610	2569	2491	2449	2482	2461	2444	2480	2575
49	2346	2407	2457	2498	2470	2435	2429	2404	2389	2323	2253	2242	2257	2246	2246	2256	2346
50	2146	2197	2247	2291	2255	2247	2214	2211	2192	2111	2064	2042	2090	2059	2055	2088	2146
51	1963	2003	2051	2102	2066	2061	2031	2022	2003	1919	1890	1877	1912	1897	1885	1913	1963
52	1790	1839	1878	1931	1901	1892	1867	1854	1818	1760	1732	1723	1745	1748	1720	1741	1790
53	1624	1692	1719	1775	1747	1742	1712	1698	1656	1596	1565	1579	1611	1618	1589	1598	1624

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54	1497	1548	1583	1627	1617	1613	1587	1553	1520	1464	1445	1454	1492	1486	1474	1475	1497
55	1374	1428	1460	1511	1489	1492	1453	1434	1394	1342	1335	1334	1373	1374	1368	1348	1374
56	1264	1309	1345	1396	1382	1388	1345	1327	1268	1235	1227	1225	1283	1278	1263	1251	1264
57	1158	1203	1238	1277	1277	1296	1239	1223	1161	1130	1120	1135	1166	1175	1168	1140	1158
58	1062	1105	1133	1182	1183	1195	1145	1127	1073	1040	1032	1044	1076	1083	1071	1055	1062
59	973	1009	1045	1080	1080	1098	1057	1026	983	955	954	950	987	990	990	969	973
60	892	924	959	992	986	1003	971	944	902	875	874	870	906	907	905	885	892
61	816	847	872	897	902	921	887	858	827	804	801	791	815	826	826	807	816
62	734	765	796	813	820	828	801	774	743	724	725	723	741	742	753	731	734
63	675	691	724	740	739	752	724	708	682	661	653	645	664	670	671	665	675
64	604	625	654	664	669	674	659	638	615	599	601	578	602	600	608	600	604
65	550	565	593	604	602	610	590	576	550	538	542	528	541	540	553	544	550
66	499	510	538	540	544	557	535	520	497	487	482	473	491	487	500	488	499
67	445	461	490	488	496	498	481	472	454	439	436	426	438	442	447	442	445
68	400	416	438	441	441	442	436	424	409	400	399	387	395	394	404	399	400
69	370	384	402	402	404	406	404	387	370	364	365	354	363	366	367	365	370
70	336	340	365	371	372	372	366	354	338	332	329	316	329	324	338	336	336
71	301	311	328	330	340	335	328	318	308	296	301	297	295	299	301	305	301
72	274	284	299	300	301	301	298	290	275	279	272	268	272	271	276	279	274

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73	250	257	273	270	272	273	271	266	251	250	248	237	242	244	251	254	250
74	228	235	245	247	247	247	247	240	228	222	223	219	226	223	230	224	228
75	199	207	218	218	219	221	217	213	202	199	197	199	203	199	201	201	199
76	175	180	195	195	194	191	192	188	180	179	177	174	177	178	179	180	175
77	155	161	170	169	170	169	174	165	158	157	155	154	154	163	161	161	155
78	133	142	149	146	145	143	145	143	130	137	138	135	138	141	140	137	133
79	121	117	133	123	129	127	129	126	115	114	116	117	120	120	121	117	121
80	93	101	110	99	106	99	105	100	95	98	98	100	104	104	103	99	93
81	80	81	91	86	87	85	88	88	79	77	80	81	80	82	88	82	80
82	66	69	76	66	75	72	74	66	64	69	68	63	72	73	72	70	66
83	50	53	61	56	57	54	53	44	48	52	50	56	58	56	57	56	50
84	39	43	42	38	42	36	40	31	34	27	43	40	43	40	37	40	39
85	24	26	31	26	30	23	21	23	18	23	26	26	32	30	32	30	24
86	15	19	18	15	17	17	13	11	7	13	17	16	22	24	18	19	15
87	8	7	15	13	12	9	12	10	0	8	10	11	13	15	12	13	8
88	0	0	10	9	14	13	10	8	0	0	8	11	15	11	12	11	0
89	0	0	0	0	11	0	10	0	0	0	9	11	12	11	12	0	0
90	0	0	11	0	9	8	11	9	0	0	9	9	11	9	8	9	0
91	0	0	9	0	14	0	0	0	0	0	10	11	11	10	0	8	0

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

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

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130	0	12	14	12	14	9	11	8	7	8	13	10	12	12	7	9	0
131	8	12	14	12	19	12	15	10	10	12	15	12	12	15	12	9	8
132	9	9	13	0	15	9	12	10	8	14	14	13	16	10	11	10	9
133	10	0	10	14	16	9	12	11	9	10	16	14	10	10	12	13	10
134	8	12	12	15	17	13	16	13	8	11	14	16	13	16	17	12	8
135	8	13	15	13	17	11	14	8	10	9	17	17	13	13	11	13	8
136	10	14	10	15	20	8	15	9	10	13	18	12	18	15	14	11	10
137	13	12	14	12	19	13	13	10	8	11	16	13	15	14	18	12	13
138	15	13	15	12	21	10	16	13	8	13	18	17	18	18	14	14	15
139	11	15	17	15	18	14	14	13	10	13	19	18	16	18	14	13	11
140	14	16	19	17	18	11	18	13	12	15	15	17	10	17	14	12	14
141	14	16	19	12	16	17	20	12	11	13	17	18	13	18	16	14	14
142	15	19	20	12	20	18	18	18	11	8	18	20	19	18	17	17	15
143	15	18	18	9	22	15	17	20	15	0	20	20	16	18	15	15	15
144	12	14	20	18	21	19	19	17	13	19	21	19	20	18	18	16	12
145	12	18	14	18	24	20	21	18	15	17	24	21	19	18	17	15	12
146	14	13	18	17	24	16	19	17	16	19	19	21	15	21	22	13	14
147	16	14	23	15	21	15	16	17	14	17	22	21	15	19	21	13	16
148	16	20	18	21	20	13	23	15	16	18	19	13	17	21	20	19	16

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149	17	18	21	22	19	17	20	16	15	17	20	20	20	21	24	17	17
150	13	18	20	21	18	21	22	17	16	18	25	19	23	20	21	18	13
151	16	16	18	19	21	20	20	21	17	19	21	22	20	22	22	20	16
152	19	19	23	18	20	22	25	24	19	20	22	21	20	23	20	16	19
153	17	20	25	14	23	14	20	17	19	17	22	21	21	24	16	13	17
154	14	19	20	24	23	17	27	22	21	14	22	20	22	24	21	17	14
155	18	20	23	27	24	22	26	23	19	16	26	22	20	25	20	19	18
156	18	17	23	20	25	16	21	23	17	14	15	21	20	26	20	19	18
157	20	21	24	23	22	23	20	24	20	26	22	25	24	25	22	20	20
158	19	24	24	21	21	22	16	20	19	19	25	23	24	17	21	25	19
159	22	23	25	21	20	21	24	20	18	23	24	21	26	20	22	22	22
160	15	24	18	22	24	20	24	22	19	25	27	22	26	24	20	15	15
161	18	23	25	20	25	22	25	25	21	24	18	20	22	23	24	25	18
162	20	26	20	19	28	19	24	18	22	22	30	22	25	25	28	24	20
163	23	23	24	26	24	21	24	27	19	20	22	23	22	20	21	19	23
164	24	17	22	22	26	27	24	21	18	21	27	26	21	25	14	24	24
165	17	22	22	24	25	23	25	23	18	17	28	26	21	24	26	16	17
166	24	25	22	21	20	23	26	28	17	24	24	25	22	24	27	23	24
167	22	20	21	24	25	26	16	21	20	22	29	23	21	27	21	21	22

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168	22	16	23	23	30	23	26	23	19	23	29	26	22	27	27	20	22
169	24	25	17	23	23	25	28	21	23	19	27	26	26	25	27	23	24
170	21	24	26	23	27	26	26	24	21	23	29	25	22	25	22	24	21
171	21	21	23	23	25	25	29	23	19	23	24	27	28	24	27	30	21
172	19	23	20	23	28	25	24	25	15	23	25	25	25	24	25	21	19
173	20	24	24	24	26	25	31	25	17	23	23	25	23	26	23	26	20
174	16	27	26	15	23	26	30	25	23	26	30	25	25	23	26	22	16
175	22	26	20	21	27	23	29	26	24	26	27	21	23	24	27	25	22
176	20	23	24	21	29	24	26	21	20	18	30	27	24	29	22	24	20
177	19	23	22	22	23	25	26	25	23	24	23	28	26	25	24	19	19
178	21	23	21	23	27	26	27	22	21	26	27	20	25	30	22	23	21
179	17	23	22	20	29	25	26	19	22	25	27	26	26	29	26	24	17
180	23	20	25	19	27	25	29	28	21	23	32	27	24	12	24	28	23

## 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	23.5	24.8	23.8	25.1	25.5	24.2	25.5	24.5	25.8	26.1
	3H	24.0	25.3	24.4	25.6	26.0	24.7	25.9	25.1	26.2	26.6
	4H	24.2	25.4	24.6	25.7	26.1	24.9	26.0	25.3	26.4	26.7
	6H	24.3	25.3	24.7	25.7	26.1	24.9	26.0	25.4	26.3	26.7
	8H	24.3	25.3	24.7	25.7	26.1	25.0	25.9	25.4	26.3	26.7
	12H	24.3	25.2	24.7	25.6	26.0	24.9	25.9	25.4	26.2	26.7
4H	2H	23.7	24.8	24.1	25.2	25.5	24.3	25.4	24.7	25.8	26.2
	3H	24.4	25.3	24.8	25.7	26.1	25.0	25.9	25.5	26.4	26.8
	4H	24.7	25.5	25.1	25.9	26.3	25.3	26.1	25.7	26.5	26.9
	6H	24.8	25.5	25.3	26.0	26.4	25.4	26.1	25.9	26.5	27.0
	8H	24.8	25.5	25.3	25.9	26.4	25.4	26.1	25.9	26.5	27.0
	12H	24.8	25.4	25.3	25.9	26.3	25.4	26.0	25.9	26.4	26.9
8H	4H	24.7	25.4	25.2	25.8	26.3	25.3	25.9	25.8	26.4	26.9
	6H	24.9	25.4	25.4	25.9	26.4	25.4	26.0	25.9	26.5	27.0
	8H	24.9	25.4	25.4	25.9	26.4	25.5	26.0	26.0	26.5	27.0
	12H	24.9	25.3	25.4	25.8	26.4	25.4	25.9	26.0	26.4	27.0
12H	4H	24.7	25.3	25.2	25.7	26.2	25.2	25.8	25.7	26.3	26.8
	6H	24.9	25.3	25.4	25.8	26.4	25.4	25.9	26.0	26.4	26.9
	8H	24.9	25.3	25.4	25.8	26.4	25.4	25.9	26.0	26.4	27.0

Maximum UGR = 27.0

## 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-35/40/50K-BL (100W,40K) 40WD		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220900	120.0	60	0.822	98.32	0.997	2.7
5E-A2	277.0	60	0.379	97.06	0.924	6.46
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

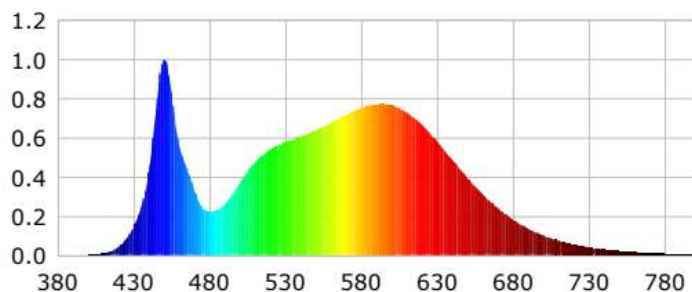
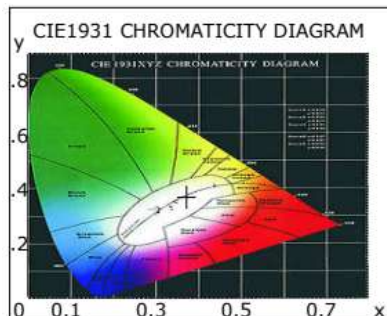
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	12
Frequency (Hz)	60	R2	89	R10	73
CCT (K)	4192	R3	93	R11	82
Duv	-0.0010	R4	83	R12	61
Chromaticity (x, y)	x=0.3718 y=0.3692	R5	82	R13	84
Chromaticity (u', v')	u(u')=0.2224 v'=0.4969	R6	84	R14	96
Color Rendering Index (CRI)	83	R7	86	R15	77
R9	12	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)	14868.0	14811.4	>=10000(-10%)
Luminous Efficacy (lm/W)	151.22	152.60	Premium: >= 135(-3%)
Most worst Luminous/Highest Watts	150.64		

## 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	0.1125	535	0.5612	176.8512	690	0.2402	75.7105
385	0.0003	0.0790	540	0.5763	181.6306	695	0.2088	65.7948
390	0.0004	0.1221	545	0.5918	186.5196	700	0.1826	57.5367
395	0.0008	0.2400	550	0.6071	191.3252	705	0.1575	49.6449
400	0.0014	0.4484	555	0.6203	195.5003	710	0.1358	42.8059
405	0.0034	1.0849	560	0.6375	200.9065	715	0.1173	36.9629
410	0.0082	2.5896	565	0.6559	206.7281	720	0.1009	31.8149
415	0.0204	6.4165	570	0.6771	213.3937	725	0.0865	27.2592
420	0.0422	13.3081	575	0.6979	219.9637	730	0.0736	23.2055
425	0.0795	25.0412	580	0.7162	225.7225	735	0.0629	19.8224
430	0.1418	44.6882	585	0.7390	232.9107	740	0.0544	17.1304
435	0.2439	76.8810	590	0.7552	238.0072	745	0.0459	14.4769
440	0.4216	132.8607	595	0.7633	240.5664	750	0.0395	12.4527
445	0.7462	235.1755	600	0.7730	243.6293	755	0.0337	10.6119
450	1.0000	315.1584	605	0.7731	243.6546	760	0.0286	9.0095
455	0.8386	264.3033	610	0.7679	242.0167	765	0.0243	7.6599
460	0.5667	178.5945	615	0.7517	236.9003	770	0.0215	6.7733
465	0.4481	141.2096	620	0.7305	230.2293	775	0.0189	5.9667
470	0.3349	105.5600	625	0.7027	221.4467	780	0.0148	4.6691
475	0.2489	78.4396	630	0.6669	210.1876	785	0.0129	4.0505
480	0.2228	70.2157	635	0.6255	197.1181	790	0.0112	3.5314
485	0.2317	73.0078	640	0.5814	183.2390	795	0.0093	2.9261
490	0.2594	81.7465	645	0.5354	168.7230	800	0.0072	2.2595
495	0.3105	97.8594	650	0.4878	153.7234			
500	0.3701	116.6543	655	0.4410	138.9735			
505	0.4252	133.9928	660	0.3950	124.5032			
510	0.4754	149.8215	665	0.3520	110.9265			
515	0.5133	161.7721	670	0.3109	97.9804			
520	0.5393	169.9570	675	0.2749	86.6455			
525	0.5612	176.8512	680	0.2402	75.7105			
530	0.5763	181.6306	685	0.2088	65.7948			



**TM30**

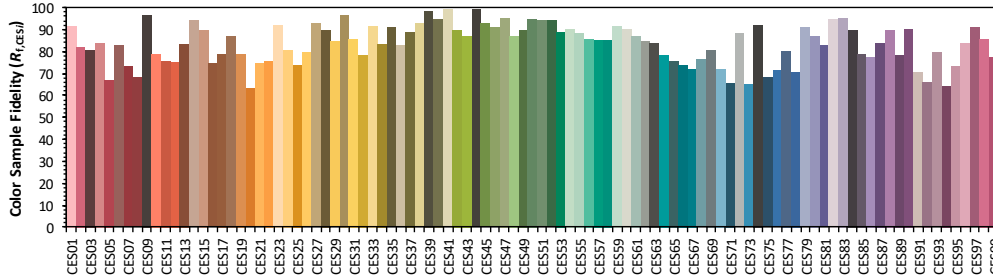
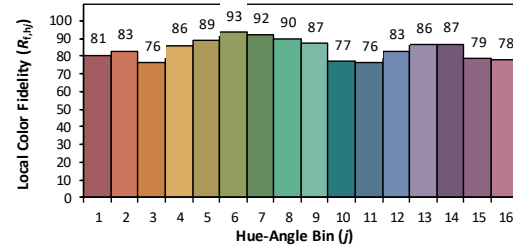
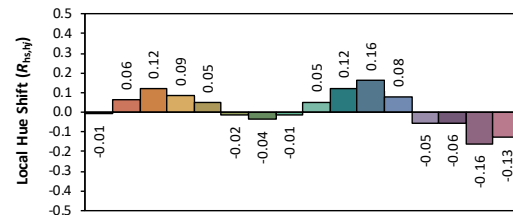
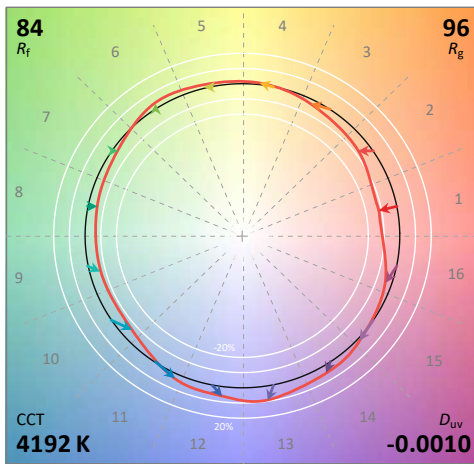
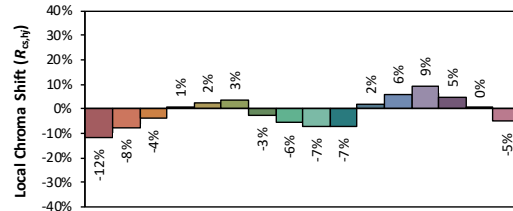
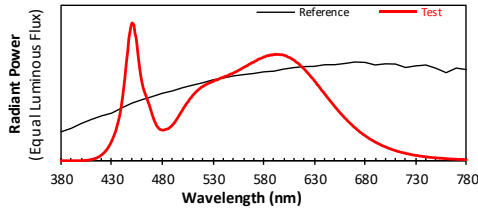
**ANSI/IES TM-30-18 Color Rendition Report**

**Source:** L128-XX80RA35000H1

**Manufacturer:** IKIO LED LIGHTING

**Date:** 2022/9/27

**Model:** IK-UFHB-240W-35/40/50K-BL(100W, 40K) 40WD



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

$x$  0.3718  
 $y$  0.3692  
 $u'$  0.2224  
 $v'$  0.4969

CIE 13.3-1995  
(CRI)  
 $R_a$  83  
 $R_g$  12

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-35/40/50K-BL (100W,50K) 50WD		

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220900	120.0	60	0.855	102.27	0.997	2.92
5E-A2	277.0	60	0.395	101.18	0.924	6.46
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

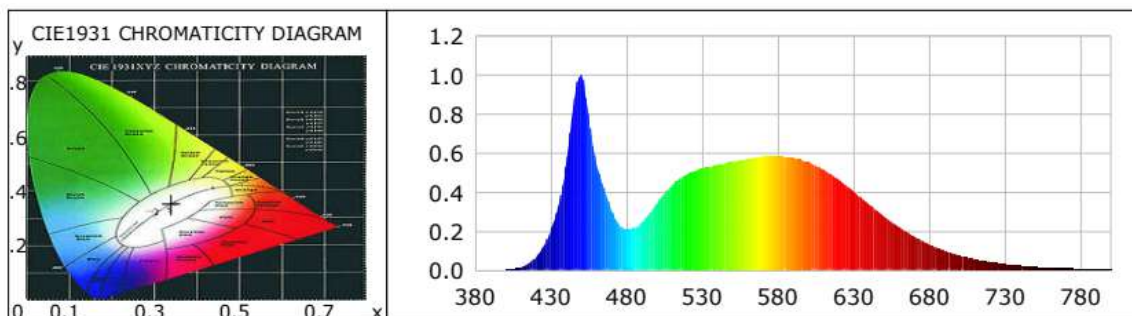
#### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	11
Frequency (Hz)	60	R2	86	R10	67
CCT (K)	5199	R3	89	R11	83
Duv	0.0007	R4	83	R12	62
Chromaticity (x, y)	x=0.3398 y=0.3488	R5	82	R13	82
Chromaticity (u', v')	u(u')=0.2089 v'=0.4825	R6	81	R14	94
Color Rendering Index (CRI)	82	R7	87	R15	77
R9	11	R8	69	--	--
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)	13851.4	13866.7	>=10000(-10%)
Luminous Efficacy (lm/W)	135.44	137.05	Premium: >= 135(-3%)
Most worst Luminous/Highest Watts	135.44		

## 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	0.1481	535	0.5089	178.1245	690	0.1718	60.1429
385	0.0002	0.0620	540	0.5191	181.6788	695	0.1500	52.4821
390	0.0004	0.1421	545	0.5298	185.4413	700	0.1314	45.9835
395	0.0007	0.2397	550	0.5402	189.0606	705	0.1144	40.0265
400	0.0019	0.6585	555	0.5466	191.3065	710	0.0996	34.8556
405	0.0055	1.9366	560	0.5544	194.0416	715	0.0861	30.1244
410	0.0140	4.9143	565	0.5623	196.7928	720	0.0739	25.8475
415	0.0318	11.1212	570	0.5710	199.8591	725	0.0641	22.4387
420	0.0637	22.2822	575	0.5763	201.7059	730	0.0551	19.2949
425	0.1172	41.0127	580	0.5803	203.0871	735	0.0468	16.3852
430	0.1994	69.8068	585	0.5841	204.4457	740	0.0409	14.3006
435	0.3252	113.8316	590	0.5833	204.1361	745	0.0356	12.4750
440	0.5333	186.6381	595	0.5796	202.8597	750	0.0293	10.2548
445	0.8418	294.6143	600	0.5746	201.1061	755	0.0255	8.9417
450	1.0000	349.9970	605	0.5663	198.2198	760	0.0221	7.7520
455	0.7999	279.9497	610	0.5532	193.6162	765	0.0189	6.6099
460	0.5537	193.7863	615	0.5355	187.4371	770	0.0162	5.6696
465	0.4234	148.1971	620	0.5169	180.9233	775	0.0146	5.1145
470	0.3092	108.2209	625	0.4921	172.2164	780	0.0120	4.1875
475	0.2338	81.8301	630	0.4649	162.7297	785	0.0091	3.1910
480	0.2092	73.2318	635	0.4349	152.2022	790	0.0086	3.0251
485	0.2153	75.3568	640	0.4025	140.8821	795	0.0077	2.6784
490	0.2431	85.0706	645	0.3720	130.1920	800	0.0068	2.3754
495	0.2894	101.3019	650	0.3392	118.7335			
500	0.3424	119.8318	655	0.3079	107.7617			
505	0.3905	136.6910	660	0.2768	96.8740			
510	0.4339	151.8588	665	0.2474	86.5772			
515	0.4675	163.6282	670	0.2205	77.1746			
520	0.4894	171.2894	675	0.1953	68.3596			
525	0.5089	178.1245	680	0.1718	60.1429			
530	0.5191	181.6788	685	0.1500	52.4821			

## TM30

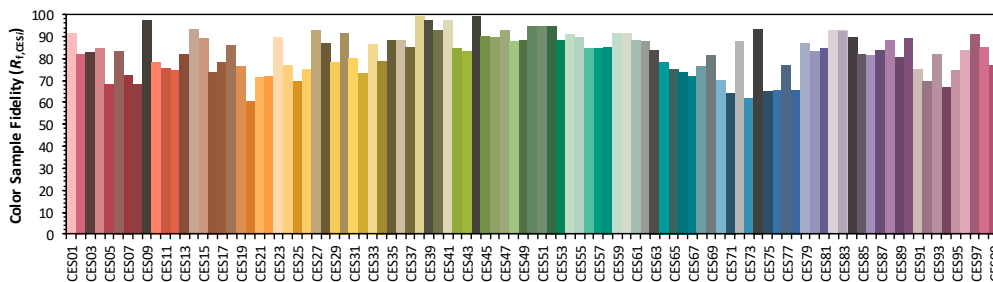
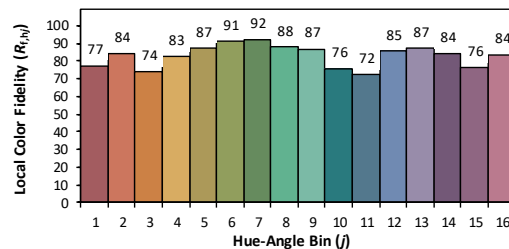
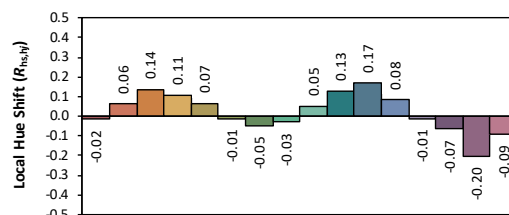
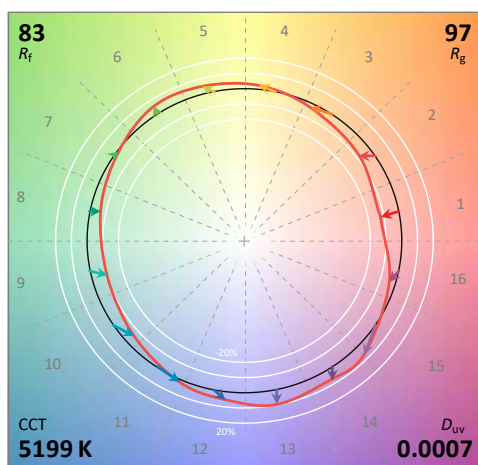
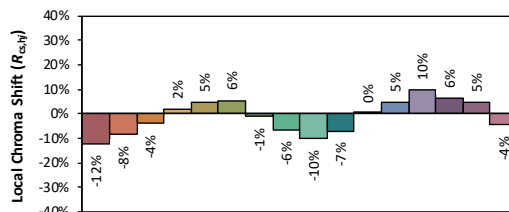
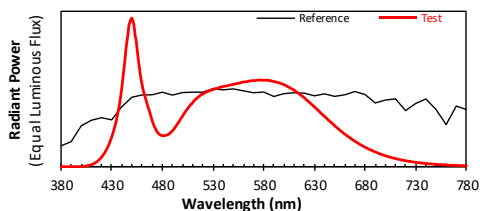
### ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RA35000H1

Manufacturer: IKIO LED LIGHTING

Date: 2022/9/27

Model: IK-UFHB-240W-35/40/50K-BL (100W, 50K) 50W



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

$x$  0.3398  
 $y$  0.3488  
 $u'$  0.2089  
 $v'$  0.4825

CIE 13.3-1995  
(CRI)  
 $R_a$  82  
 $R_g$  11

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 \*\*\*\*\***