

LM-79-08 Test Report

For

IKIO LED LIGHTING

(Brand Name: IKIO)

8470 Allison Pointe Blvd, Suite 128 Indianapolis, IN 46250

Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires

Model name(s):

IK-EMWP-15WBDPDA1-BRPEM35/40/50

Remark: "a" can be any two letters to represent lamp colors: BR=Brown, BH=Black, or Customized;

"b" can be "P" or blank, P= Photocontrol type provided;

"C" can be "EM" or blank, EM= Emergency Battery;

"d" can be any digits or blank to represents CCT.

Representative (Tested) Model:

IK-EMWP-15WBDPDA1-BRPEM35/40/50 (3500K)

IK-EMWP-15WBDPDA1-BRPEM35/40/50 (4000K)

IK-EMWP-15WBDPDA1-BRPEM35/40/50 (5000K)

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

Test & Report By:

Winnie Wu

Engineer: WinnieWu

Date: 2021-11-09

Review By:

Jason Luo

Manager: Jason Luo

1.1 Product Information:

Organization Name	IKIO LED LIGHTING	
Brand Name	IKIO	
Model Number	IK-EMWP-15WBDPDA1-BRPEM35/40/50	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires	
Rated Voltage / Frequency	120-277 VAC, 50/60 Hz	
Nominal Power	15W	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K,4000K,5000K(Color tunable)	
LED Manufacturer	Lumileds.	
LED Model	L128-3080RA35003H1 L128-5080RA35003H1	
Sample Number	BLC2109022E-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	2021-10-30
Date of Test	2021-11-03
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 ° vertical intervals and 22.5 ° horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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	2021-11-03	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-EMWP-15WBPDPA1-BRPEM35/40/50 (3500K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC210701	120.0	60	0.113	13.35	0.987	9.63
6E-A1	277.0	60	0.057	14.03	0.884	15.4
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3430
Duv	0.0006
Chromaticity (x, y)	x=0.4100 y=0.3944
Chromaticity (u', v')	u(u')=0.2372 v'(v')=0.5135
Color Rendering Index (CRI)	82
R9	4
Rf	84
Rg	96
Rcs,h1(%)	-12

Special Color Rendering Indices			
R1	80	R9	4
R2	89	R10	74
R3	96	R11	81
R4	81	R12	64
R5	81	R13	82
R6	86	R14	98
R7	87	R15	73
R8	61	--	--
--	--	--	--
--	--	--	--
--	--	--	--

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)	1740.0	1776.7	300-5000(-10%)
Luminous Efficacy (lm/W)	130.34	126.64	--
Most worst Luminous/Highest	124.02		
0-90 °Luminous Efficacy (lm/W)	120.02	116.61	Premium: $\geq 120(-3\%)^{***}$
Zonal lumens in the 80-90°(%)	5.13	--	$\leq 10(+3)^{***}$
Beam Angle (°)	96.0	--	--
Center Beam Candle Power (cd)	557	--	--

*** Lumen output and efficacy are evaluated considering the light output in the 0-90° zone only.

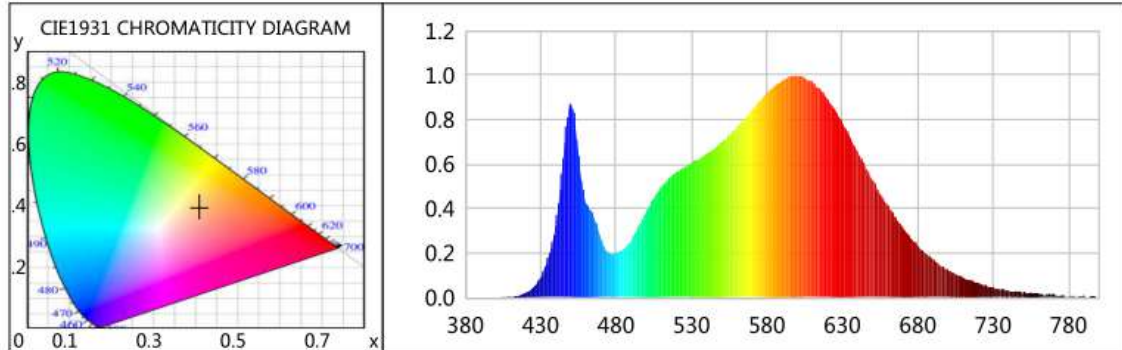
Laboratory: UTEST TECHNICAL LABORATORY A2LA Certificate# 4810.01

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Report Format Number BL-FM-SA-012

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	0.0066	525	0.5859	21.1450	670	0.3138	11.3231
385	0.0014	0.0505	530	0.6050	21.8341	675	0.2703	9.7542
390	0.0014	0.0497	535	0.6248	22.5472	680	0.2334	8.4232
395	0.0010	0.0348	540	0.6467	23.3370	685	0.1981	7.1506
400	0.0016	0.0591	545	0.6707	24.2049	690	0.1707	6.1591
405	0.0024	0.0868	550	0.6994	25.2423	695	0.1450	5.2342
410	0.0031	0.1121	555	0.7313	26.3903	700	0.1235	4.4566
415	0.0085	0.3075	560	0.7639	27.5670	705	0.1032	3.7259
420	0.0216	0.7792	565	0.8024	28.9569	710	0.0905	3.2655
425	0.0449	1.6220	570	0.8411	30.3546	715	0.0748	2.7000
430	0.0909	3.2801	575	0.8828	31.8583	720	0.0649	2.3404
435	0.1764	6.3645	580	0.9188	33.1589	725	0.0539	1.9458
440	0.3276	11.8209	585	0.9508	34.3127	730	0.0468	1.6885
445	0.6309	22.7668	590	0.9754	35.2004	735	0.0350	1.2624
450	0.8737	31.5312	595	0.9946	35.8924	740	0.0339	1.2224
455	0.6441	23.2433	600	1.0000	36.0888	745	0.0319	1.1528
460	0.4257	15.3641	605	0.9905	35.7453	750	0.0251	0.9050
465	0.3654	13.1885	610	0.9717	35.0683	755	0.0227	0.8200
470	0.2665	9.6192	615	0.9399	33.9209	760	0.0191	0.6887
475	0.2014	7.2673	620	0.8965	32.3522	765	0.0116	0.4180
480	0.1999	7.2149	625	0.8437	30.4477	770	0.0147	0.5316
485	0.2198	7.9315	630	0.7869	28.3983	775	0.0097	0.3504
490	0.2575	9.2934	635	0.7238	26.1203	780	0.0062	0.2239
495	0.3197	11.5388	640	0.6595	23.8019	785	0.0021	0.0772
500	0.3865	13.9494	645	0.5935	21.4195	790	0.0124	0.4471
505	0.4462	16.1039	650	0.5290	19.0921	795	0.0067	0.2407
510	0.4957	17.8901	655	0.4690	16.9263	800	0.0040	0.1432
515	0.5346	19.2922	660	0.4111	14.8367			
520	0.5650	20.3913	665	0.3607	13.0172			

TM30

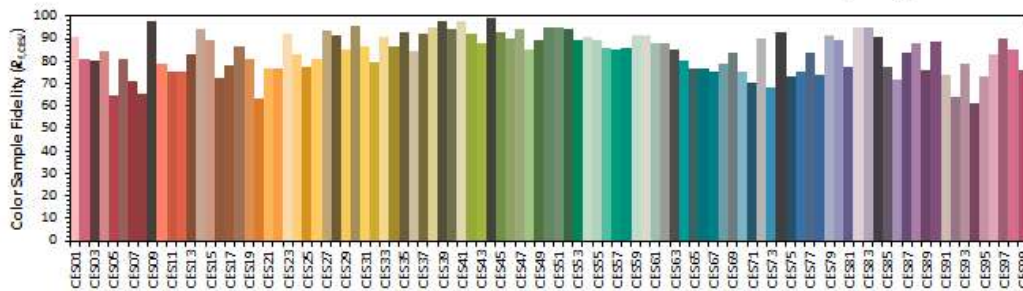
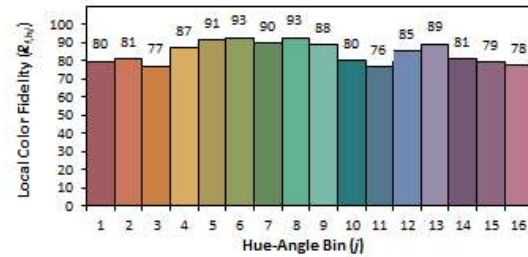
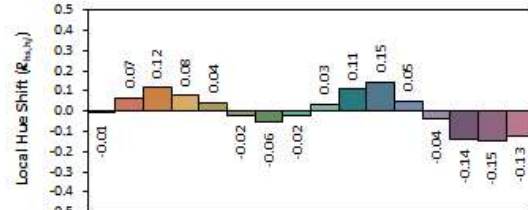
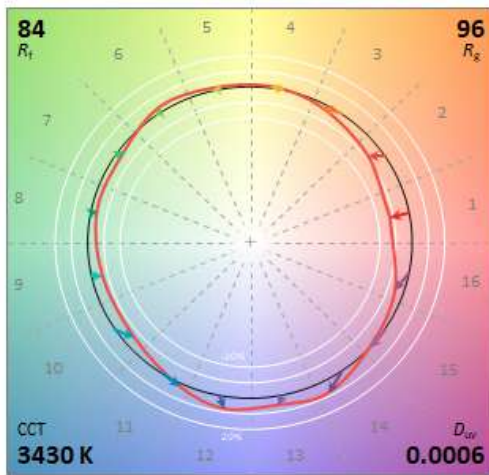
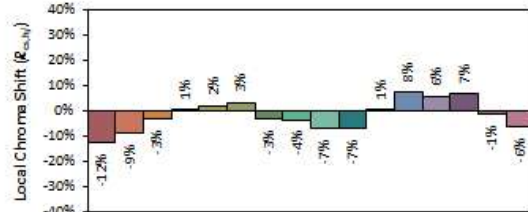
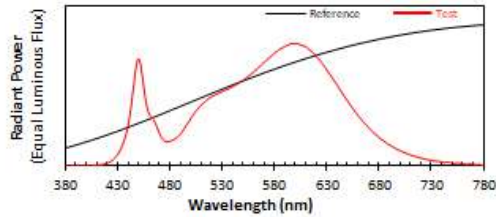
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35003H1
L128-5080RA35003H1

Manufacturer: IKIO LED Lighting

Date: 2021/11/3

Model: IK-EMWP-15WBPDPA1-BRPEM35/40/50 (3500K)



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

x 0.4100
 y 0.3944
 u' 0.2372
 v' 0.5135

CIE 13.3-1995 (CRI)
 R_a 82
 R_g 4

Zonal Lumen Tabulation

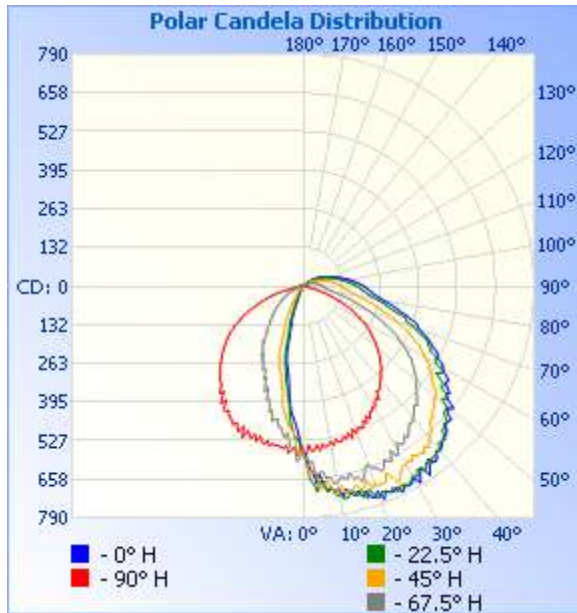
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	400.7	23%	23%
0-40	648.5	37.3%	37.3%
0-60	1,171.2	67.3%	67.3%
60-90	431.2	24.8%	24.8%
0-100	279.0	16%	16%
90-120	120.8	6.9%	6.9%
0-90	1,602.3	92.1%	92.1%
90-180	137.6	7.9%	7.9%
0-180	1,739.9	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	53.4	3.1%	90-100	59.6	3.4%
10-20	142.5	8.2%	100-110	38.8	2.2%
20-30	204.8	11.8%	110-120	22.5	1.3%
30-40	247.9	14.2%	120-130	10.8	0.6%
40-50	266.4	15.3%	130-140	3.7	0.2%
50-60	256.2	14.7%	140-150	1.1	0.1%
60-70	211.7	12.2%	150-160	0.7	0%
70-80	137.2	7.9%	160-170	0.4	0%
80-90	82.2	4.7%	170-180	0.2	0%

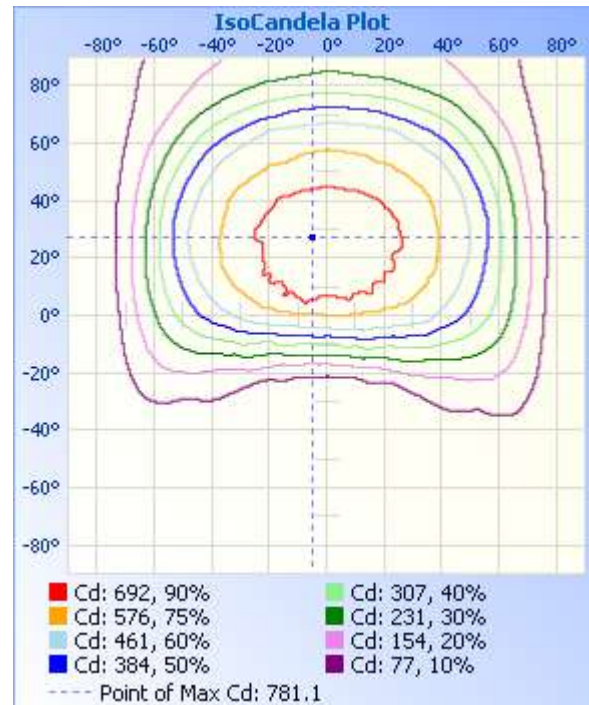
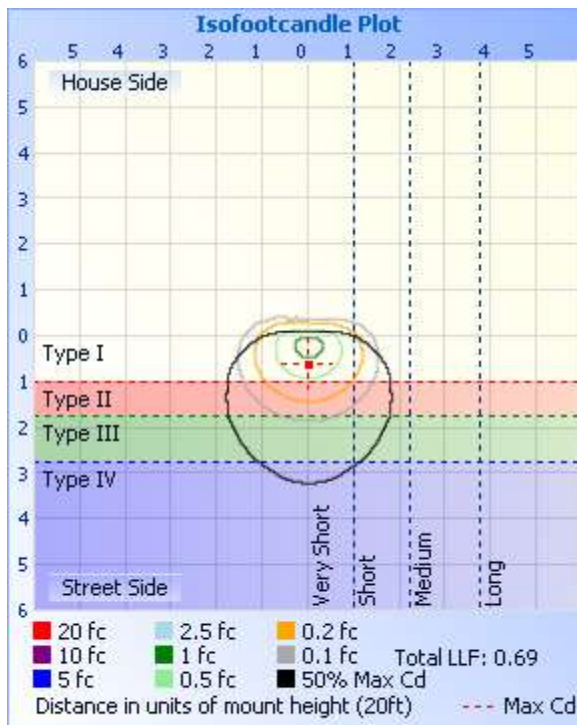
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	1.93 fc	28.3 ft	48.1 ft
34.0ft	0.48 fc	56.6 ft	96.2 ft
51.0ft	0.21 fc	85.0 ft	144.2 ft
68.0ft	0.12 fc	113.3 ft	192.3 ft
85.0ft	0.08 fc	141.6 ft	240.4 ft
102.0ft	0.05 fc	169.9 ft	288.5 ft

■ Vert. Spread: 79.6°
■ Horiz. Spread: 109.5°



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	557	557	557	557	557	557	557	557	557	557	557	557	557	557	557	557	557
1	579	593	603	601	579	589	580	556	538	544	571	586	552	549	561	570	579
2	622	659	651	599	541	548	544	535	498	519	567	598	578	598	628	624	622
3	636	673	635	600	564	541	485	513	475	519	523	549	550	586	655	653	636
4	673	702	639	655	560	541	488	476	453	495	491	557	559	609	633	701	673
5	643	669	694	640	543	481	490	437	438	475	487	539	570	644	667	687	643
6	690	671	689	634	563	494	451	418	414	437	479	502	546	622	695	680	690
7	702	707	666	660	542	493	433	397	381	396	458	519	557	633	663	719	702
8	695	691	693	658	554	468	432	382	345	375	440	506	553	656	679	690	695
9	708	725	724	681	549	482	400	338	315	345	424	487	550	672	705	707	708
10	701	722	701	679	538	451	366	320	295	333	408	485	551	680	704	704	701
11	729	737	692	668	552	437	352	286	279	307	360	462	547	665	705	731	729
12	707	739	724	668	534	452	325	274	269	291	348	465	557	645	699	747	707
13	724	723	715	676	544	416	299	264	249	273	332	472	540	655	700	726	724
14	736	723	711	656	545	420	291	257	222	253	306	436	555	653	719	732	736
15	723	738	701	682	533	407	287	228	173	234	303	444	548	671	716	733	723
16	747	721	722	676	541	388	276	186	159	196	294	419	532	678	717	719	747
17	732	756	717	697	524	393	261	161	134	165	279	400	552	692	709	742	732
18	755	729	695	677	547	355	252	139	134	153	258	404	531	673	727	725	755
19	762	755	729	653	516	356	230	130	113	137	255	365	548	667	722	752	762
20	744	767	716	646	532	344	199	118	88	130	232	382	538	632	722	778	744
21	777	751	726	666	519	310	183	100	65	106	197	365	527	674	712	759	777
22	752	756	726	668	520	306	164	79	52	86	179	334	557	668	729	769	752
23	763	761	724	685	525	295	150	61	42	68	162	343	519	676	718	766	763
24	766	753	697	678	502	283	135	47	39	54	154	314	543	672	712	748	766
25	757	773	716	654	515	289	128	41	33	44	140	309	530	660	707	759	757
26	779	760	746	662	493	282	124	38	26	40	133	317	518	636	729	757	779
27	764	759	732	668	506	266	104	31	19	37	127	300	529	652	733	750	764
28	771	767	713	635	486	269	92	26	15	30	102	287	516	666	729	766	771
29	768	761	701	662	486	261	84	20	13	23	96	290	514	642	741	764	768

30	756	749	704	649	476	263	63	16	11	18	85	267	507	649	695	766	756
31	781	757	693	622	478	245	61	13	10	15	61	279	495	644	701	755	781
32	756	738	704	637	463	246	56	12	9	13	68	260	503	623	697	753	756
33	738	742	686	635	456	227	40	11	9	12	53	254	499	634	711	746	738
34	776	752	700	617	464	200	43	10	7	10	46	248	468	635	692	743	776
35	756	734	694	626	438	198	33	9	7	10	49	230	488	604	719	733	756
36	729	746	704	615	440	194	28	8	6	9	35	236	474	629	698	744	729
37	751	735	684	601	436	183	29	7	5	9	34	210	449	614	703	743	751
38	745	731	699	591	426	166	22	6	5	8	32	201	463	594	681	720	745
39	724	725	683	596	415	167	20	6	4	7	24	194	448	588	701	737	724
40	728	730	672	584	414	158	19	5	4	7	24	193	434	599	680	734	728
41	724	707	667	578	405	151	15	5	4	6	22	174	433	588	674	719	724
42	712	712	655	566	396	143	13	4	3	6	17	170	427	574	670	707	712
43	704	713	638	556	391	141	12	4	3	5	17	166	415	566	650	713	704
44	704	685	627	562	386	136	11	4	3	5	15	158	408	553	647	694	704
45	695	682	630	550	374	128	10	3	2	5	13	152	400	561	634	679	695
46	674	674	612	541	366	123	9	3	2	4	12	144	395	557	631	678	674
47	679	674	613	530	361	118	8	3	2	4	12	141	385	539	621	665	679
48	681	647	605	522	351	113	8	3	0	4	11	138	376	526	629	656	681
49	653	645	588	511	340	106	8	2	1	3	9	128	368	524	613	642	653
50	647	642	594	509	333	100	6	2	1	3	9	123	363	507	601	646	647
51	661	611	586	499	322	95	7	1	1	2	9	118	350	513	598	626	661
52	631	621	575	486	315	88	6	2	1	3	9	112	346	499	580	618	631
53	612	612	556	476	304	82	6	1	1	3	9	106	336	490	580	625	612
54	620	582	547	467	295	78	6	1	1	2	8	101	327	475	564	599	620
55	601	589	539	454	283	75	5	0	0	2	8	92	317	472	553	591	601
56	587	564	529	449	277	67	5	1	1	2	7	88	310	455	549	582	587
57	593	542	513	431	266	65	4	0	1	2	7	84	300	446	530	555	593
58	578	559	509	419	251	61	4	0	1	1	7	82	290	437	519	565	578
59	558	553	495	405	245	57	4	0	1	1	6	74	273	430	516	576	558
60	552	525	480	389	226	53	3	0	1	1	6	70	274	415	518	541	552
61	543	517	469	375	221	45	4	0	1	1	6	68	253	404	493	526	543

62	519	515	456	364	202	47	3	0	1	1	6	61	244	395	477	522	519
63	516	490	447	345	197	40	4	0	1	1	5	60	236	375	467	503	516
64	509	485	426	333	183	36	3	1	0	1	5	52	222	364	453	492	509
65	490	472	414	311	169	33	3	0	1	1	5	53	208	346	441	487	490
66	478	465	397	298	155	32	3	0	1	1	4	45	196	332	427	474	478
67	466	455	381	280	145	28	2	0	1	1	4	43	180	316	410	467	466
68	451	430	363	263	132	25	2	0	1	1	4	37	170	298	392	455	451
69	435	414	347	249	118	23	2	1	1	1	4	35	162	284	376	426	435
70	420	401	332	231	106	18	1	0	1	1	4	33	147	268	364	413	420
71	413	376	314	213	95	15	2	1	1	0	4	27	135	253	348	395	413
72	406	370	300	199	82	13	2	0	1	1	3	25	123	236	331	381	406
73	384	365	282	183	70	11	2	0	1	1	3	22	111	223	317	378	384
74	370	341	265	171	59	8	2	0	1	1	3	18	100	204	299	362	370
75	349	319	252	159	49	7	1	1	1	1	3	16	82	190	286	339	349
76	337	305	240	145	39	6	2	0	1	1	3	15	66	176	268	322	337
77	321	292	225	134	30	5	1	1	1	1	3	11	52	164	253	307	321
78	310	282	213	119	23	5	1	1	1	1	3	8	43	151	241	292	310
79	293	268	201	109	17	5	1	1	1	1	3	8	35	139	227	281	293
80	281	254	191	99	14	4	1	1	1	1	2	7	28	127	216	268	281
81	267	241	181	92	12	4	1	0	1	1	2	7	21	116	203	253	267
82	257	232	173	86	11	4	1	0	1	1	2	6	16	107	191	242	257
83	249	223	165	82	12	4	1	1	1	1	2	6	13	99	183	232	249
84	240	216	159	78	11	2	1	0	1	1	2	6	12	92	176	225	240
85	234	210	154	76	10	2	1	0	1	1	2	5	10	87	169	218	234
86	229	204	149	74	9	3	0	1	1	1	2	5	11	82	162	212	229
87	223	199	144	72	9	3	0	1	1	1	2	5	10	79	156	205	223
88	218	194	140	71	9	2	1	0	1	1	1	5	10	78	152	201	218
89	213	189	136	68	9	2	1	0	1	1	2	4	9	75	147	195	213
90	208	184	132	67	8	3	0	0	1	1	2	4	9	73	143	190	208
91	201	178	128	65	9	2	0	1	0	1	2	4	9	72	139	185	201
92	195	172	124	63	9	2	0	1	1	1	2	5	8	70	135	179	195
93	188	166	119	61	9	2	1	1	1	1	2	4	8	68	131	173	188

94	182	160	115	59	9	2	0	0	1	1	2	4	8	66	126	167	182
95	176	155	112	58	8	2	1	1	1	1	1	4	7	64	123	162	176
96	170	150	108	55	8	2	1	1	1	2	2	4	6	62	118	156	170
97	164	144	104	53	7	2	0	1	1	2	2	4	5	60	115	150	164
98	158	138	101	51	6	2	0	1	1	1	1	3	3	58	110	145	158
99	151	133	97	49	3	1	0	0	1	1	2	4	1	56	106	139	151
100	145	128	93	47	1	2	1	1	1	2	2	3	0	54	102	134	145
101	139	123	90	45	0	2	0	1	1	1	1	3	0	52	99	129	139
102	134	119	86	44	0	1	1	1	1	1	1	3	0	50	95	124	134
103	129	114	83	42	0	1	1	1	1	2	1	1	0	48	92	119	129
104	123	109	79	39	0	1	1	0	1	0	1	2	0	46	88	114	123
105	118	105	75	38	0	1	0	1	1	2	1	3	0	44	84	110	118
106	113	100	73	36	0	1	1	0	1	2	1	3	0	42	80	106	113
107	108	96	68	34	0	1	0	1	1	1	1	3	0	40	77	100	108
108	103	91	66	33	0	1	0	1	1	1	1	3	0	38	74	97	103
109	99	88	63	31	0	1	1	1	1	2	1	3	0	36	70	92	99
110	94	83	59	29	0	1	0	1	1	2	2	3	0	34	67	87	94
111	90	79	57	28	0	1	1	1	1	2	2	3	0	32	63	83	90
112	85	75	54	26	0	1	0	1	2	2	1	3	0	30	61	79	85
113	81	71	51	24	0	0	0	1	2	1	1	3	0	29	57	75	81
114	77	68	48	23	0	0	1	1	2	1	1	2	0	27	54	72	77
115	73	64	46	22	0	1	1	1	1	1	2	2	0	26	51	68	73
116	70	61	42	20	0	0	1	2	2	2	1	3	0	24	49	65	70
117	66	58	40	19	0	0	0	1	1	2	2	3	0	23	45	61	66
118	62	54	37	18	0	0	1	0	2	2	2	2	0	21	42	58	62
119	58	51	35	17	0	0	1	1	2	2	1	2	0	20	40	54	58
120	56	48	33	15	0	0	0	1	2	2	2	2	0	19	37	51	56
121	52	45	31	14	0	0	1	1	1	2	2	2	0	17	35	48	52
122	49	43	29	13	0	0	1	1	1	2	2	2	0	16	32	45	49
123	46	40	27	12	0	0	1	1	2	2	2	2	0	14	31	42	46
124	44	38	25	11	0	0	1	1	1	2	2	2	0	13	28	40	44
125	41	35	23	10	0	0	1	1	2	2	2	2	0	12	26	37	41

126	33	33	21	9	0	0	1	1	2	2	2	2	0	11	24	35	33
127	26	31	19	8	0	0	1	1	2	2	2	2	0	10	22	32	26
128	18	29	18	8	0	0	0	1	2	2	2	2	0	9	20	30	18
129	15	26	16	6	0	0	1	2	2	2	2	2	0	8	18	28	15
130	13	24	14	6	0	0	1	1	2	2	2	2	0	7	17	26	13
131	12	23	13	5	0	0	1	2	2	2	2	2	0	6	15	24	12
132	11	21	12	5	0	0	1	2	2	2	2	2	0	5	13	22	11
133	9	19	10	5	0	0	2	2	2	1	2	2	0	5	10	20	9
134	9	17	8	4	0	0	1	2	2	2	2	2	0	4	9	18	9
135	7	15	7	4	0	0	1	1	2	1	2	2	0	4	7	16	7
136	7	13	6	3	0	0	1	2	2	2	2	2	0	3	5	14	7
137	6	12	5	3	0	0	2	1	2	2	2	2	0	3	4	13	6
138	6	11	4	3	0	0	1	2	2	2	2	2	0	3	4	11	6
139	5	9	4	3	0	0	1	2	2	2	2	2	0	2	3	10	5
140	5	8	3	2	0	0	2	2	2	2	2	2	0	2	3	8	5
141	4	6	3	2	0	0	1	2	2	2	3	2	0	2	2	7	4
142	4	6	2	2	0	0	1	2	2	2	2	3	0	2	2	5	4
143	3	3	2	2	0	0	2	2	2	2	2	2	0	1	1	4	3
144	2	3	2	2	0	1	2	2	2	2	2	2	0	1	0	4	2
145	2	2	2	2	0	1	1	2	2	2	2	3	0	1	0	3	2
146	2	3	2	2	0	0	2	2	2	2	2	2	0	1	1	2	2
147	1	1	2	2	0	0	2	2	2	2	3	3	0	0	1	1	1
148	1	1	2	2	0	1	2	2	2	2	2	3	0	1	1	1	1
149	1	1	2	2	0	0	1	2	2	2	3	3	0	1	1	1	1
150	1	1	2	2	0	1	2	2	2	2	2	3	0	1	1	1	1
151	1	1	2	2	0	1	2	2	3	2	3	3	0	1	1	0	1
152	2	1	2	2	0	1	1	2	2	1	2	3	0	1	1	1	2
153	1	1	2	2	0	1	2	2	2	3	2	3	0	0	0	0	1
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156	1	1	2	2	0	1	2	2	2	3	2	2	0	1	0	0	1
157	1	2	2	2	0	1	2	2	3	2	2	3	0	1	1	1	1

158	1	2	2	2	0	1	2	2	3	3	2	3	0	1	1	1	1
159	1	1	2	2	0	1	1	2	2	2	2	3	0	1	1	1	1
160	1	1	2	2	0	1	2	2	2	3	2	2	0	0	1	1	1
161	1	2	2	2	0	0	2	2	2	3	2	3	0	0	1	1	1
162	1	2	2	2	0	1	2	2	2	3	2	3	0	1	1	0	1
163	1	1	2	2	0	1	2	2	3	2	2	3	0	0	1	2	1
164	1	2	2	2	0	0	2	1	3	3	3	3	0	0	0	1	1
165	2	2	2	2	0	1	2	2	2	2	2	2	0	1	1	2	2
166	2	2	2	2	0	1	2	2	1	3	2	3	0	1	1	1	2
167	2	2	2	2	0	0	2	2	2	3	2	3	0	1	1	1	2
168	2	2	2	2	0	1	2	2	2	3	2	3	0	1	1	1	2
169	2	2	2	2	0	1	2	2	2	3	2	2	0	1	1	1	2
170	2	1	2	3	0	1	1	2	2	2	2	3	0	1	1	1	2
171	2	2	2	2	0	1	2	2	2	3	3	3	0	1	1	2	2
172	2	2	2	2	0	1	1	2	2	2	2	3	0	1	1	1	2
173	2	2	2	2	0	1	2	2	2	3	3	3	1	0	1	1	2
174	2	2	3	2	0	1	2	2	2	2	3	2	0	1	1	2	2
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178	2	2	2	2	0	0	2	2	2	2	2	2	1	1	2	2	2
179	2	2	3	2	0	1	2	2	2	2	2	2	1	1	2	2	2
180	1	2	2	2	0	1	1	2	2	1	2	2	1	1	2	2	1

BUG

Lum. Classification System (LCS)

<u>LCS Zone</u>	<u>Lumens</u>	<u>%Lamp</u>	<u>%Lum</u>
FL (0-30)	290.0	16.7	16.7
FM (30-60)	670.2	38.5	38.5
FH (60-80)	324.8	18.7	18.7
FVH (80-90)	80.5	4.6	4.6
BL (0-30)	110.6	6.4	6.4
BM (30-60)	100.4	5.8	5.8
BH (60-80)	24.1	1.4	1.4
BVH(80-90)	1.7	0.1	0.1
UL (90-100)	59.5	3.4	3.4
UH (100-180)	78.0	4.5	4.5
Total	1739.8	100.1	100.0
BUG Rating	B1-U3-G1		

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2021-11-03	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-EMWP-15WBPDPA1-BRPEM35/40/50 (4000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC210701	120.0	60	0.111	13.10	0.986	9.85
6E-A1	277.0	60	0.056	13.71	0.883	15.72
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

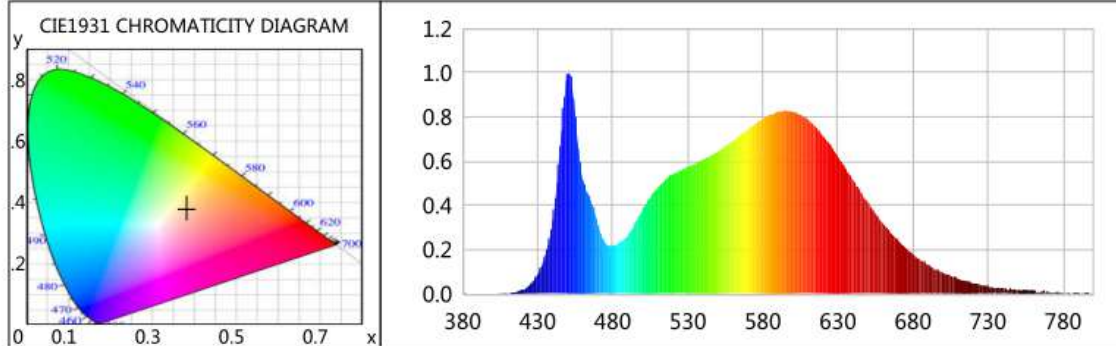
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	6
Frequency (Hz)	60	R2	89	R10	74
CCT (K)	3931	R3	95	R11	81
Duv	0.002	R4	82	R12	61
Chromaticity (x, y)	x=0.3836 y=0.3791	R5	81	R13	83
Chromaticity (u', v')	u(u')=0.2263 v'=0.5031	R6	85	R14	97
Color Rendering Index (CRI)	83	R7	85	R15	75
R9	6	R8	63	--	--
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)	1814.7	1847.8	300-5000(-10%)
Luminous Efficacy (lm/W)	138.53	134.78	--
Most worst Luminous/Highest	132.36		

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	0.0083	525	0.5598	23.4678	670	0.2416	10.1291
385	0.0008	0.0347	530	0.5742	24.0719	675	0.2096	8.7870
390	0.0011	0.0455	535	0.5895	24.7139	680	0.1804	7.5615
395	0.0008	0.0325	540	0.6085	25.5067	685	0.1531	6.4175
400	0.0014	0.0578	545	0.6232	26.1247	690	0.1337	5.6039
405	0.0017	0.0714	550	0.6434	26.9702	695	0.1114	4.6685
410	0.0023	0.0951	555	0.6668	27.9528	700	0.0939	3.9372
415	0.0073	0.3062	560	0.6912	28.9755	705	0.0812	3.4023
420	0.0190	0.7947	565	0.7187	30.1295	710	0.0691	2.8972
425	0.0424	1.7775	570	0.7439	31.1831	715	0.0566	2.3732
430	0.0885	3.7086	575	0.7699	32.2738	720	0.0487	2.0406
435	0.1735	7.2725	580	0.7945	33.3043	725	0.0431	1.8060
440	0.3323	13.9321	585	0.8096	33.9398	730	0.0357	1.4969
445	0.6687	28.0308	590	0.8240	34.5413	735	0.0265	1.1101
450	1.0000	41.9200	595	0.8306	34.8201	740	0.0276	1.1591
455	0.8046	33.7268	600	0.8233	34.5110	745	0.0254	1.0627
460	0.5187	21.7453	605	0.8102	33.9629	750	0.0186	0.7817
465	0.4302	18.0331	610	0.7880	33.0351	755	0.0185	0.7735
470	0.3192	13.3791	615	0.7571	31.7373	760	0.0149	0.6245
475	0.2323	9.7361	620	0.7158	30.0064	765	0.0102	0.4290
480	0.2183	9.1530	625	0.6726	28.1956	770	0.0131	0.5497
485	0.2343	9.8227	630	0.6204	26.0054	775	0.0074	0.3106
490	0.2654	11.1237	635	0.5675	23.7898	780	0.0032	0.1356
495	0.3196	13.3979	640	0.5142	21.5547	785	0.0017	0.0702
500	0.3805	15.9492	645	0.4632	19.4159	790	0.0100	0.4189
505	0.4353	18.2465	650	0.4112	17.2367	795	0.0045	0.1880
510	0.4815	20.1834	655	0.3638	15.2503	800	0.0029	0.1225
515	0.5150	21.5881	660	0.3175	13.3083			
520	0.5401	22.6422	665	0.2786	11.6810			

TM30

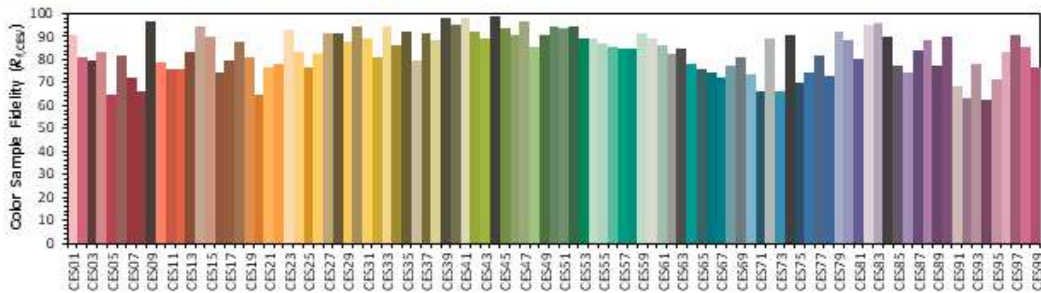
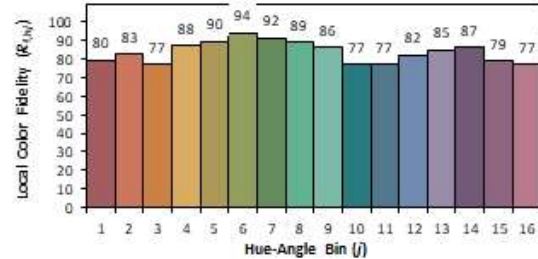
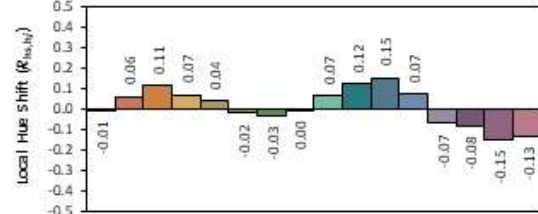
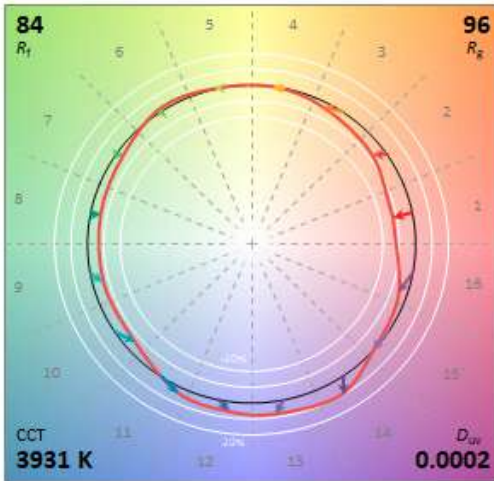
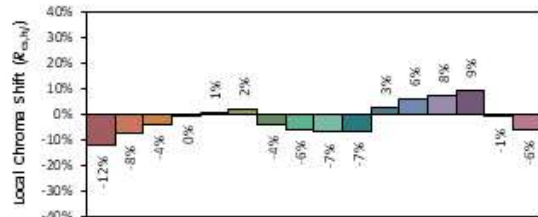
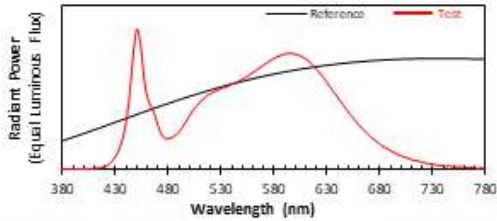
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35003H1
L128-5080RA35003H1

Date: 2021/11/3

Manufacturer: IKIO LED Lighting

Model: IK-EMWP-15WBDPA1-BRPEM35/40/50 (4000K)



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

x **0.3836**
 y **0.3791**
 u' **0.2263**
 v' **0.5031**

CIE 13.3-1995
(CRI)
 R_a 83
 R_g 6

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	2021-11-03	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-EMWP-15WBPDPA1-BRPEM35/40/50 (5000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC210902	120.0	60	0.112	13.27	0.987	9.71
2E-A1	277.0	60	0.057	13.98	0.883	15.39
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

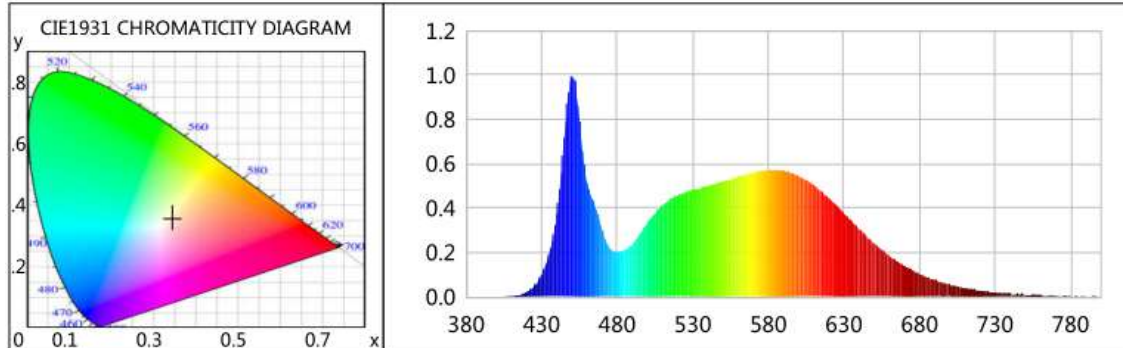
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	-2
Frequency (Hz)	60	R2	87	R10	69
CCT (K)	4984	R3	93	R11	79
Duv	0.0025	R4	80	R12	54
Chromaticity (x, y)	x=0.3461 y=0.3575	R5	79	R13	81
Chromaticity (u', v')	u(u')=0.2098 v'=-0.4876	R6	82	R14	96
Color Rendering Index (CRI)	81	R7	86	R15	73
R9	-2	R8	64	--	--
Rf	82	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-14	--	--	--	--

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)	1775.8	1816.0	300-5000(-10%)
Luminous Efficacy (lm/W)	133.82	129.90	--
Most worst Luminous/Highest	127.02		

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0036	525	0.4720	26.2075	670	0.1408	7.8169
385	0.0006	0.0328	530	0.4821	26.7705	675	0.1206	6.6949
390	0.0009	0.0523	535	0.4910	27.2635	680	0.1039	5.7699
395	0.0007	0.0398	540	0.5016	27.8521	685	0.0874	4.8542
400	0.0013	0.0696	545	0.5102	28.3317	690	0.0767	4.2617
405	0.0017	0.0951	550	0.5204	28.8951	695	0.0644	3.5759
410	0.0029	0.1622	555	0.5295	29.4023	700	0.0540	2.9981
415	0.0085	0.4729	560	0.5415	30.0682	705	0.0457	2.5401
420	0.0214	1.1907	565	0.5525	30.6793	710	0.0392	2.1774
425	0.0480	2.6674	570	0.5604	31.1211	715	0.0323	1.7947
430	0.0998	5.5428	575	0.5680	31.5433	720	0.0281	1.5594
435	0.1950	10.8258	580	0.5724	31.7857	725	0.0242	1.3419
440	0.3707	20.5861	585	0.5714	31.7317	730	0.0208	1.1535
445	0.7180	39.8721	590	0.5689	31.5882	735	0.0155	0.8582
450	1.0000	55.5297	595	0.5601	31.1032	740	0.0159	0.8856
455	0.7915	43.9543	600	0.5471	30.3793	745	0.0146	0.8121
460	0.5142	28.5556	605	0.5278	29.3065	750	0.0111	0.6158
465	0.4129	22.9256	610	0.5046	28.0215	755	0.0109	0.6055
470	0.3025	16.7977	615	0.4753	26.3958	760	0.0086	0.4799
475	0.2206	12.2492	620	0.4447	24.6944	765	0.0071	0.3926
480	0.2038	11.3180	625	0.4124	22.8985	770	0.0073	0.4075
485	0.2127	11.8095	630	0.3763	20.8979	775	0.0049	0.2740
490	0.2373	13.1767	635	0.3404	18.9028	780	0.0027	0.1515
495	0.2814	15.6287	640	0.3064	17.0143	785	0.0006	0.0361
500	0.3315	18.4068	645	0.2720	15.1065	790	0.0061	0.3393
505	0.3753	20.8387	650	0.2414	13.4029	795	0.0033	0.1817
510	0.4129	22.9262	655	0.2120	11.7708	800	0.0011	0.0587
515	0.4397	24.4176	660	0.1859	10.3229			
520	0.4581	25.4380	665	0.1613	8.9596			

TM30

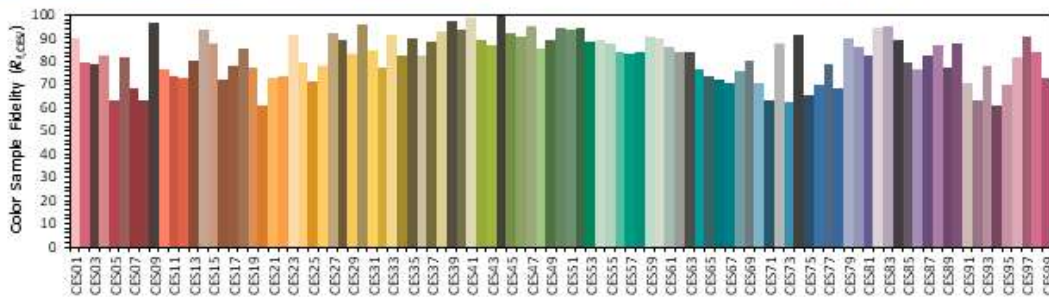
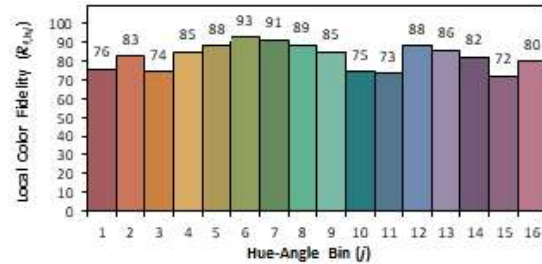
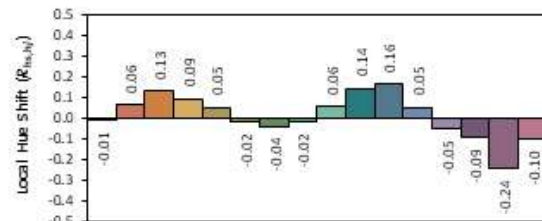
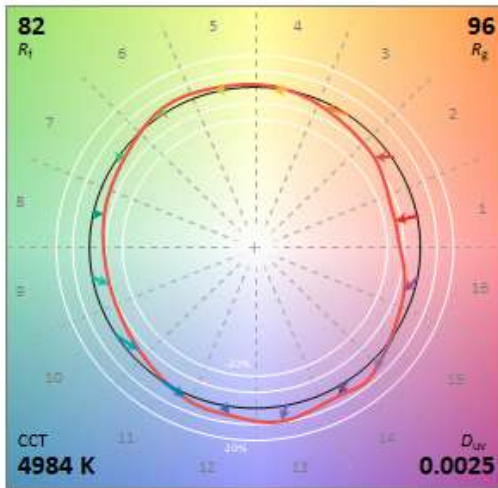
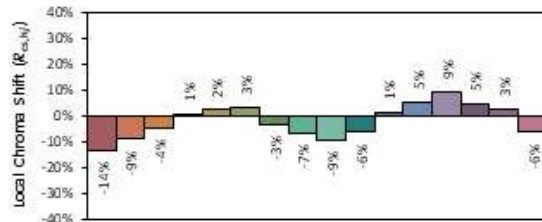
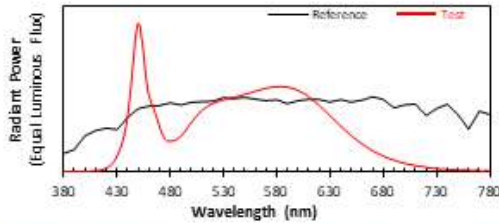
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35003H1
L128-5080RA35003H1

Date: 2021/11/3

Manufacturer: IKIO LED Lighting

Model: IK-EMWP-15WBDPA1-BRPEM35/40/50 (5000K)



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

x **0.3461**
 y **0.3575**
 u' **0.2098**
 v' **0.4876**

CIE 13.3-1995
(CRI)
 R_a 81
 R_g -2

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.	Next Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2022-01-18
AC Power Source	CHP-500	DYBWD010159	2022-01-25
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2022-01-24
Digital Power Meter	WT500	DYDWQ20010	2022-01-25
Integral Sphere (2M)	2M	DYJCE120067	2022-01-18
Digital Power Meter	WT500	DYDWQ20006	2022-01-25
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2022-01-18

Expand Uncertainty:
Photometric Measurement (Sphere): 2.08%, k=2
Chromaticity Measurement(Sphere):25.6K, k=2
Photometric Measurement(Goniophotometer):2.645%, k=2

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