LM-79-08 Test Report

For

IKIO LED LIGHTING

(Brand Name: IKIO)

8470 Allison Pointe Blvd, Suite 128 Indianapolis, IN 46250

Direct Linear Ambient Luminaires

Model name(s): IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)

Remark: "a" can be any two letters for lamp colors, "b" can be "M" or blank for Motion Sensor provided or not, "c" can be "E" or blank for Emergency Driver provided or not, "d" can be "D", "e" can be any digits for CCT, "f" can be "R" or blank.

Representative (Tested) Model:
IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)
IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)
IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)

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

Test & Report By:

Winny Wu

Engineer: Winny Wu

Date: 2023-12-11

Review By:

Jason Luo

Manager: Jason Luo

1.1 Product Information:

Organization Name	IKIO LED LIGHTING	
Brand Name	IKIO	
Model Number	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Direct Linear Ambient Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	20W(Power adjustable)	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K, 5000K (Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-3080RA35000H1 L128-5080RA35000H1	
Sample Number	UTC2311030E-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	2023-11-21
Date of Test	2023-11-23
Test item	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	1. IES LM-79-2019 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° C ± 1° 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 25º C ± 1º 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:
IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W):1.0598

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 25º C ± 1º 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	2023-11-23	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC231103	120.0	60	0.163	19.49	0.997	4.79
0E-D1	277.0	60	0.081	20.16	0.898	22.05
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

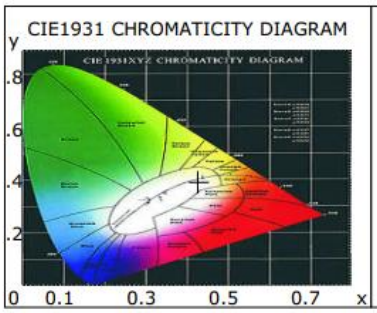
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3111
Duv	-0.0016
Chromaticity (x, y)	x=0.4271 y=0.3966
Chromaticity (u', v')	u(u')=0.2474 v'=0.5169
Color Rendering Index (CRI)	84
R9	13
Rf	85
Rg	95
Rcs,h1(%)	-11

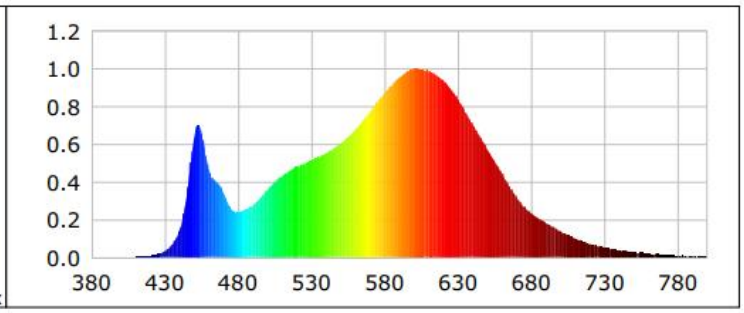
Special Color Rendering Indices			
R1	84	R9	13
R2	94	R10	86
R3	94	R11	82
R4	82	R12	73
R5	85	R13	86
R6	93	R14	98
R7	81	R15	76
R8	60	--	--
--	--	--	--
--	--	--	--

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)	2831.1	2840.0	375 lm/ft (-10%)
Luminous Efficacy (lm/W)	145.26	140.87	Standard: >= 115(-3%)
Most worst Luminous/Highest	140.43		
Zonal lumens in the 0-60° zone (%)	68.50	--	>=40(-3%)
Beam Angle (°)	118.1	--	--
Center Beam Candle Power (cd)	847	--	--

Spectral Power Distribution & Chromaticity Diagram



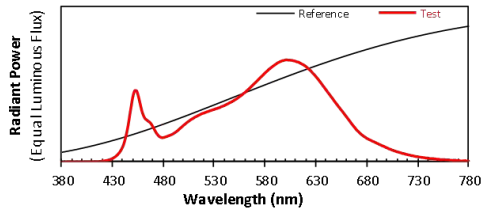


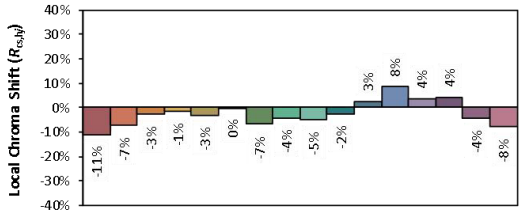
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0000	0.0000	535	0.4977	27.6903	690	0.3137	17.4539
385	0.0004	0.0208	540	0.5145	28.6206	695	0.2668	14.8437
390	0.0005	0.0274	545	0.5314	29.5640	700	0.2314	12.8731
395	0.0009	0.0514	550	0.5524	30.7326	705	0.2062	11.4686
400	0.0008	0.0420	555	0.5788	32.1969	710	0.1827	10.1641
405	0.0012	0.0663	560	0.6062	33.7232	715	0.1591	8.8515
410	0.0011	0.0617	565	0.6402	35.6175	720	0.1375	7.6468
415	0.0034	0.1916	570	0.6781	37.7264	725	0.1160	6.4515
420	0.0083	0.4616	575	0.7236	40.2527	730	0.0991	5.5137
425	0.0158	0.8781	580	0.7718	42.9384	735	0.0835	4.6447
430	0.0334	1.8579	585	0.8224	45.7495	740	0.0719	3.9985
435	0.0687	3.8223	590	0.8724	48.5313	745	0.0612	3.4058
440	0.1435	7.9844	595	0.9156	50.9339	750	0.0524	2.9154
445	0.3291	18.3077	600	0.9546	53.1076	755	0.0433	2.4063
450	0.6285	34.9648	605	0.9843	54.7590	760	0.0382	2.1230
455	0.6681	37.1648	610	0.9996	55.6086	765	0.0335	1.8623
460	0.4715	26.2278	615	0.9976	55.4995	770	0.0273	1.5171
465	0.4019	22.3604	620	0.9879	54.9572	775	0.0239	1.3322
470	0.3438	19.1256	625	0.9676	53.8314	780	0.0202	1.1226
475	0.2611	14.5273	630	0.9373	52.1448	785	0.0171	0.9494
480	0.2390	13.2977	635	0.8938	49.7250	790	0.0145	0.8094
485	0.2557	14.2274	640	0.8370	46.5621	795	0.0114	0.6363
490	0.2772	15.4185	645	0.7737	43.0419	800	0.0087	0.4840
495	0.3141	17.4723	650	0.7064	39.3000			
500	0.3589	19.9687	655	0.6389	35.5434			
505	0.3978	22.1314	660	0.5725	31.8505			
510	0.4312	23.9886	665	0.5084	28.2807			
515	0.4584	25.5028	670	0.4438	24.6897			
520	0.4792	26.6591	675	0.3762	20.9302			
525	0.4977	27.6903	680	0.3137	17.4539			
530	0.5145	28.6206	685	0.2668	14.8437			

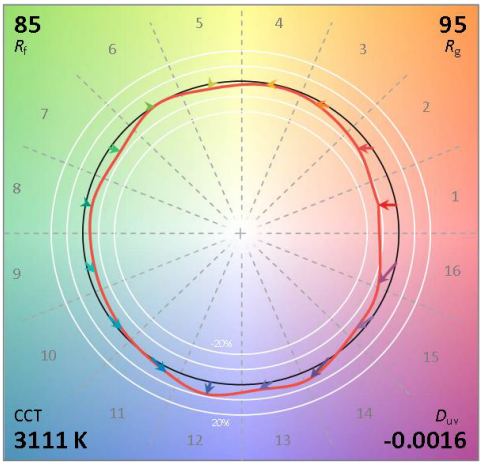
TM30

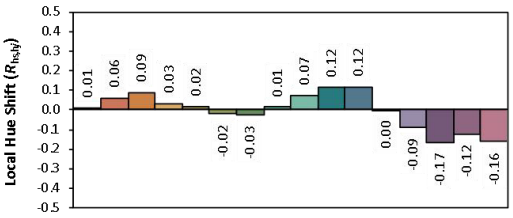
ANSI/IES TM-30-18 Color Rendition Report

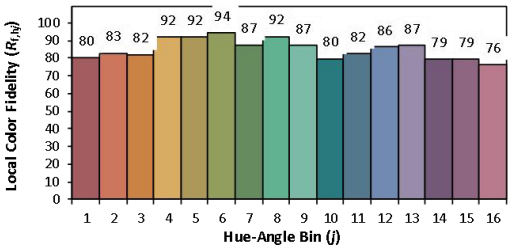
Source:	L128-3080RA35000H1	Manufacturer:	IKIO LED LIGHTING
Date:	2023/11/23	Model:	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)

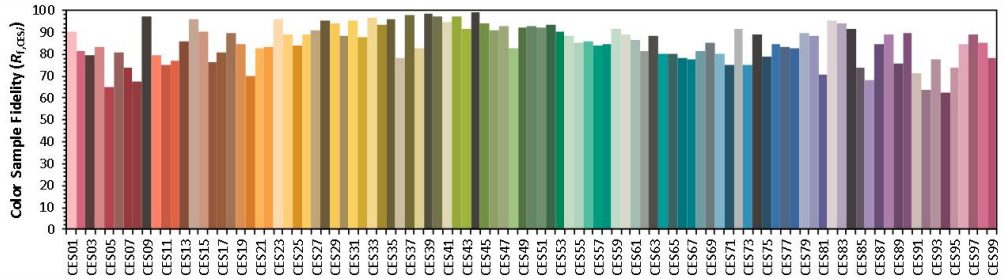












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4271
y	0.3966
u'	0.2474
v'	0.5169

CIE 13.3-1995 (CRI)

R_a	84
R_9	13

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

Zonal Lumen Tabulation

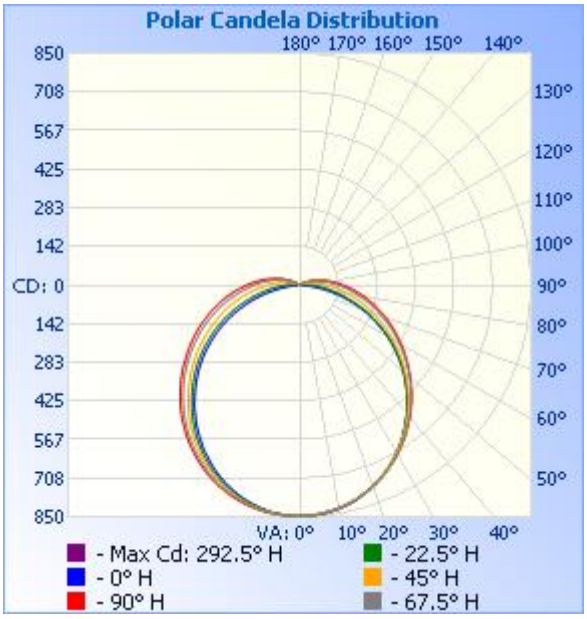
Zonal Lumen Summary

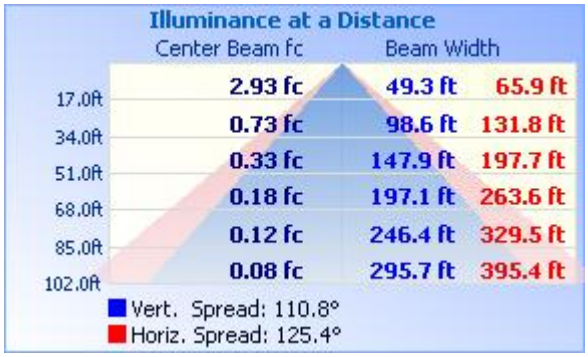
Zone	Lumens	% Lamp	% Luminaire
0-30	658.6	23.3%	23.3%
0-40	1,080.5	38.2%	38.2%
0-60	1,938.1	68.5%	68.5%
60-90	741.6	26.2%	26.2%
70-100	480.2	17%	17%
90-120	137.1	4.8%	4.8%
0-90	2,679.7	94.7%	94.7%
90-180	151.2	5.3%	5.3%
0-180	2,830.9	100%	100%

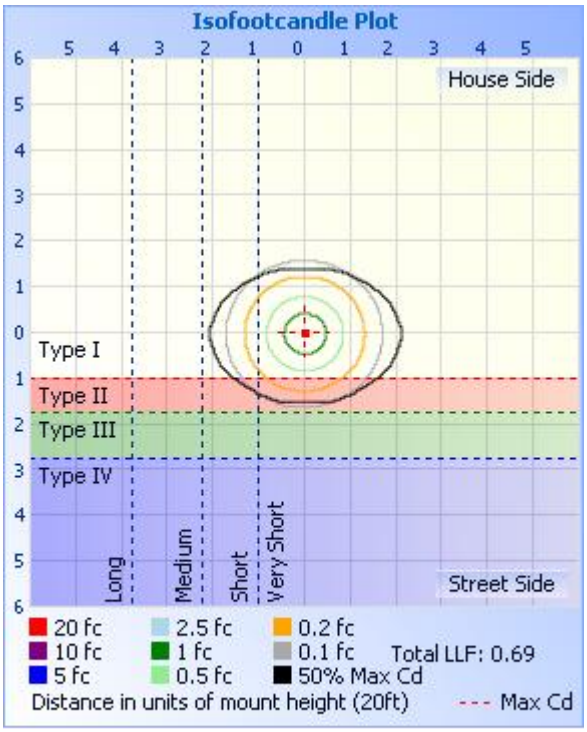
Lumens Per Zone

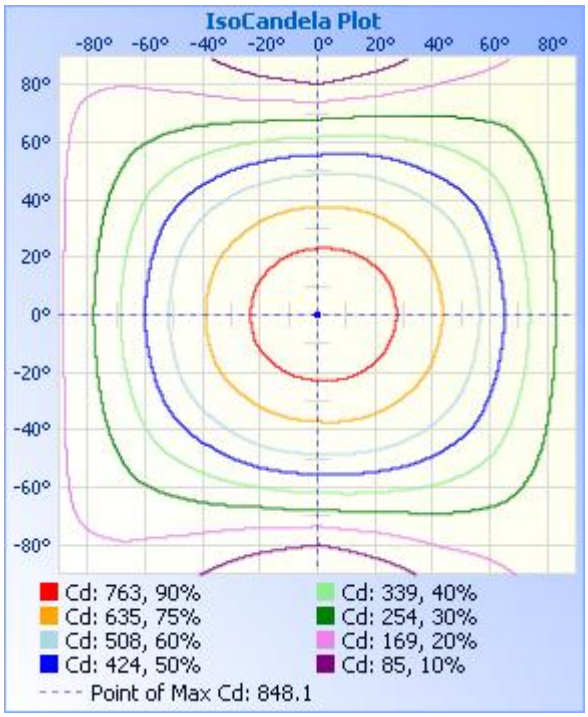
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	80.2	2.8%	90-100	82.3	2.9%
10-20	229.7	8.1%	100-110	39.8	1.4%
20-30	348.7	12.3%	110-120	15.0	0.5%
30-40	421.9	14.9%	120-130	5.0	0.2%
40-50	443.2	15.7%	130-140	3.3	0.1%
50-60	414.3	14.6%	140-150	2.6	0.1%
60-70	343.7	12.1%	150-160	1.8	0.1%
70-80	247.4	8.7%	160-170	1.1	0%
80-90	150.5	5.3%	170-180	0.4	0%

Photometric Data









Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847
1	848	847	847	846	846	847	846	847	848	847	847	847	847	848	847	848	848
2	847	847	846	846	845	846	846	846	847	847	847	847	847	848	847	847	847
3	847	846	846	845	844	845	845	845	845	846	847	847	847	848	847	847	847
4	846	845	844	843	843	843	843	844	844	845	845	846	846	848	846	846	846
5	844	843	843	842	841	842	841	842	842	843	844	845	845	846	846	845	844
6	843	842	841	840	839	840	839	840	840	842	843	844	844	845	844	844	843
7	841	840	839	838	837	838	837	838	839	840	840	843	843	844	843	842	841
8	839	837	836	836	834	835	834	834	836	838	839	841	842	843	841	840	839
9	836	834	834	833	832	832	831	832	832	834	836	839	840	841	838	837	836
10	833	831	831	830	829	830	828	829	829	832	834	837	838	839	837	835	833
11	830	828	827	827	826	826	825	824	825	828	831	834	835	836	834	832	830
12	826	824	823	824	822	823	820	821	821	825	828	830	833	834	831	828	826
13	822	820	819	820	818	819	816	816	817	821	824	828	830	831	827	825	822
14	818	816	815	816	815	815	812	812	813	816	820	825	827	828	824	821	818
15	813	811	810	812	811	810	807	807	808	812	816	821	824	824	820	817	813
16	809	806	806	807	805	806	802	802	803	807	812	817	820	821	816	812	809
17	804	801	802	802	801	801	796	797	797	802	807	812	816	817	812	807	804
18	798	796	795	797	796	796	792	791	790	797	803	808	813	812	807	802	798
19	792	790	790	791	790	791	785	785	785	791	797	804	808	808	803	797	792
20	787	784	784	786	785	785	779	778	778	784	791	799	803	803	797	790	787
21	780	778	778	781	779	779	773	772	772	779	786	793	799	798	792	786	780
22	774	771	772	774	773	773	766	765	766	772	780	788	793	793	786	779	774
23	767	765	765	768	767	767	760	757	757	765	773	782	788	787	779	772	767
24	760	758	758	762	760	760	752	750	750	759	768	776	783	782	773	765	760
25	753	751	751	755	754	754	744	742	742	752	760	770	777	776	767	758	753
26	745	744	744	748	747	746	737	735	734	744	753	764	771	769	760	750	745
27	737	735	735	740	739	739	730	727	726	736	746	757	764	763	752	743	737
28	729	727	728	733	732	731	722	718	717	729	739	750	758	757	745	735	729

29	719	719	719	725	725	724	712	708	709	720	731	743	751	749	738	727	719
30	711	710	711	717	717	716	704	699	700	712	723	736	744	743	730	718	711
31	703	701	703	709	709	707	696	691	691	702	714	728	737	735	722	710	703
32	694	693	694	701	701	699	687	681	681	693	706	721	730	727	714	701	694
33	684	683	685	693	693	690	678	671	671	684	698	713	722	720	706	692	684
34	674	674	676	684	684	682	669	662	662	675	689	704	715	712	697	683	674
35	664	664	666	675	676	673	658	652	652	666	679	696	707	703	688	674	664
36	653	654	657	665	667	663	648	642	642	655	669	688	698	696	679	664	653
37	644	643	647	657	657	654	638	632	632	645	660	680	691	688	669	654	644
38	633	634	637	648	648	645	628	621	621	635	651	670	682	679	660	644	633
39	622	623	627	638	639	635	617	611	610	625	641	662	673	669	650	634	622
40	612	612	617	629	630	625	607	601	599	614	631	653	664	660	639	625	612
41	602	602	607	619	621	615	596	590	588	604	621	644	656	652	629	615	602
42	590	590	596	609	611	605	585	580	577	592	611	635	647	641	619	605	590
43	579	580	586	599	601	595	574	568	565	581	600	624	638	633	609	594	579
44	568	568	576	590	592	585	563	557	554	571	589	615	629	623	599	583	568
45	557	557	564	580	582	574	551	547	543	559	579	606	620	613	587	573	557
46	546	545	553	569	572	564	540	536	532	548	568	596	610	603	576	562	546
47	534	534	543	559	561	553	529	524	519	537	557	586	599	594	566	552	534
48	523	521	531	548	551	542	517	513	508	525	547	576	591	583	555	540	523
49	511	510	520	538	541	532	505	501	496	514	535	566	580	573	544	530	511
50	499	499	509	528	531	521	494	490	484	502	524	556	571	563	533	519	499
51	487	486	497	517	520	510	482	478	472	490	513	546	561	553	521	507	487
52	474	474	486	507	511	499	471	465	459	478	503	535	552	542	509	497	474
53	462	461	474	496	500	488	459	453	447	466	492	525	541	532	499	484	462
54	449	449	463	485	490	478	447	441	434	454	480	515	532	522	487	473	449
55	436	436	451	475	481	466	436	428	421	441	469	505	521	511	476	462	436
56	423	424	440	464	470	456	424	414	408	429	458	494	511	500	466	449	423
57	411	412	428	454	460	444	412	401	395	416	448	483	501	489	454	436	411
58	397	399	416	442	450	434	401	388	381	405	436	473	490	479	443	424	397
59	384	385	404	432	440	422	390	376	368	391	425	463	481	467	431	410	384

60	370	372	392	421	430	411	379	362	355	378	413	452	471	457	421	397	370
61	357	360	381	411	419	401	368	348	340	366	402	442	461	446	409	385	357
62	343	347	369	401	410	391	356	335	327	354	390	431	452	436	398	371	343
63	329	334	358	389	399	380	345	321	314	340	379	421	441	426	387	358	329
64	315	320	346	379	390	369	335	308	300	328	368	411	431	414	375	345	315
65	302	308	335	368	379	359	324	295	287	315	357	401	421	404	364	331	302
66	288	295	324	358	369	349	313	280	271	302	346	389	411	394	355	319	288
67	274	283	313	347	360	339	303	268	257	290	336	379	402	383	344	305	274
68	261	268	303	338	350	329	291	255	244	276	324	369	393	372	333	291	261
69	246	256	291	327	340	319	281	241	228	263	314	359	382	363	322	278	246
70	231	241	280	316	330	309	270	228	215	250	303	349	372	353	311	264	231
71	217	229	270	306	321	300	258	216	201	238	292	339	363	343	300	250	217
72	203	218	260	297	312	289	247	203	187	224	282	329	353	333	290	239	203
73	189	204	249	287	302	280	237	192	173	211	272	319	344	323	280	227	189
74	176	192	239	278	293	271	227	179	158	199	262	308	335	313	269	213	176
75	161	180	229	267	284	262	217	168	145	187	251	299	325	303	258	201	161
76	147	168	219	258	275	253	207	157	131	176	241	289	315	293	247	189	147
77	133	157	210	248	266	243	197	146	118	164	231	280	306	284	237	178	133
78	120	147	200	239	257	234	188	134	104	154	221	270	297	274	227	166	120
79	107	135	191	230	248	225	179	124	92	143	212	260	288	265	218	156	107
80	94	126	180	222	240	217	169	115	80	134	202	250	279	256	207	144	94
81	80	115	171	212	230	207	161	106	67	123	193	241	270	247	197	133	80
82	69	106	162	203	223	199	152	96	56	113	184	232	260	238	188	123	69
83	58	97	154	195	214	190	144	87	46	104	174	222	252	229	178	113	58
84	47	88	145	187	206	182	136	79	37	95	164	214	244	220	169	104	47
85	38	80	137	179	199	174	129	71	28	86	155	205	236	211	161	94	38
86	28	71	129	172	190	165	121	64	20	78	147	198	227	202	153	86	28
87	21	64	121	164	182	158	114	57	15	70	140	189	218	194	144	77	21
88	15	58	114	157	175	151	106	51	10	64	131	182	210	186	137	69	15
89	10	51	107	150	168	144	100	45	7	57	125	175	202	178	129	62	10
90	7	46	101	143	160	137	94	41	7	51	118	168	194	170	122	55	7

91	6	40	94	136	153	131	88	36	7	45	112	161	187	162	114	49	6
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93	5	31	83	123	140	117	76	28	5	35	99	147	171	148	100	38	5
94	5	28	78	117	133	111	71	24	6	31	92	141	164	141	94	32	5
95	4	24	72	112	126	106	66	21	5	27	86	134	156	134	87	29	4
96	5	21	67	106	120	100	62	18	5	23	80	128	150	128	82	25	5
97	4	18	61	100	114	95	57	15	5	20	74	121	143	121	76	22	4
98	4	16	57	95	107	89	52	13	5	18	69	116	136	115	70	19	4
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110	2	3	16	39	47	36	14	4	3	4	22	52	65	53	24	4	2
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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2023-11-23	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC231103	120.0	60	0.159	19.02	0.997	5.11
0E-D1	277.0	60	0.078	19.4	0.899	22.21
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3969
Duv	-0.0029
Chromaticity (x, y)	x=0.3798 y=0.3702
Chromaticity (u', v')	u(u')=0.2273v'=0.4986
Color Rendering Index (CRI)	86
R9	20
Rf	85
Rg	95
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	86	R9	20
R2	94	R10	84
R3	96	R11	84
R4	84	R12	65
R5	86	R13	88
R6	90	R14	99
R7	85	R15	80
R8	67	--	--
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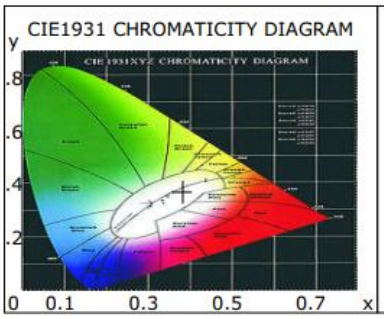
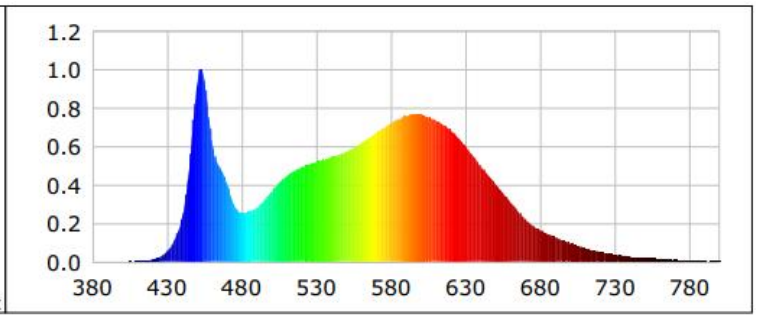
Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2924.7	3052.2	375 lm/ft (-10%)
Luminous Efficacy (lm/W)	153.77	157.33	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	150.76		

Spectral Power Distribution & Chromaticity Diagram



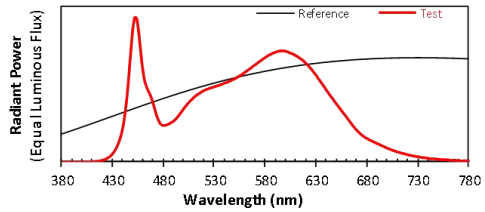


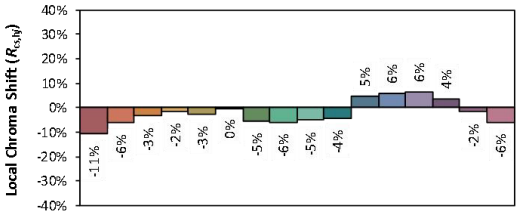
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.0253	535	0.5086	34.0387	690	0.2215	14.8244
385	0.0006	0.0401	540	0.5199	34.7910	695	0.1876	12.5548
390	0.0006	0.0432	545	0.5299	35.4613	700	0.1637	10.9575
395	0.0005	0.0314	550	0.5450	36.4748	705	0.1447	9.6829
400	0.0006	0.0427	555	0.5576	37.3155	710	0.1279	8.5573
405	0.0018	0.1176	560	0.5749	38.4753	715	0.1119	7.4880
410	0.0018	0.1223	565	0.5950	39.8225	720	0.0960	6.4240
415	0.0050	0.3326	570	0.6184	41.3837	725	0.0820	5.4877
420	0.0116	0.7760	575	0.6435	43.0644	730	0.0705	4.7165
425	0.0252	1.6867	580	0.6709	44.8962	735	0.0595	3.9827
430	0.0543	3.6313	585	0.6972	46.6628	740	0.0516	3.4503
435	0.1122	7.5087	590	0.7216	48.2906	745	0.0431	2.8862
440	0.2271	15.1989	595	0.7425	49.6918	750	0.0378	2.5301
445	0.4939	33.0534	600	0.7586	50.7656	755	0.0288	1.9296
450	0.9094	60.8616	605	0.7690	51.4652	760	0.0270	1.8044
455	0.9506	63.6200	610	0.7675	51.3661	765	0.0235	1.5720
460	0.6373	42.6527	615	0.7540	50.4612	770	0.0200	1.3374
465	0.4972	33.2761	620	0.7374	49.3487	775	0.0164	1.0977
470	0.4084	27.3315	625	0.7147	47.8317	780	0.0150	1.0048
475	0.2949	19.7356	630	0.6850	45.8413	785	0.0119	0.7945
480	0.2527	16.9112	635	0.6461	43.2407	790	0.0109	0.7304
485	0.2606	17.4417	640	0.6024	40.3146	795	0.0081	0.5429
490	0.2817	18.8539	645	0.5513	36.8926	800	0.0061	0.4103
495	0.3189	21.3443	650	0.5007	33.5079			
500	0.3671	24.5654	655	0.4517	30.2305			
505	0.4096	27.4114	660	0.4031	26.9789			
510	0.4472	29.9279	665	0.3568	23.8762			
515	0.4725	31.6249	670	0.3118	20.8673			
520	0.4936	33.0346	675	0.2633	17.6208			
525	0.5086	34.0387	680	0.2215	14.8244			
530	0.5199	34.7910	685	0.1876	12.5548			

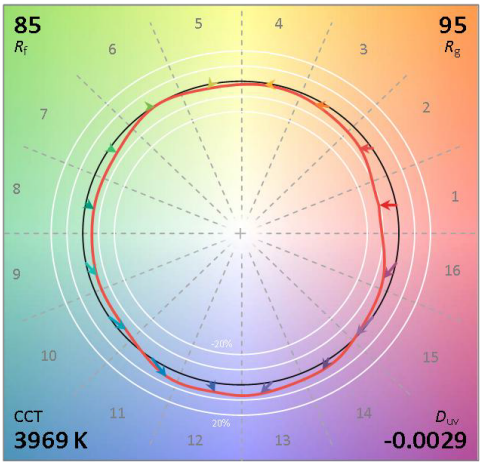
TM30

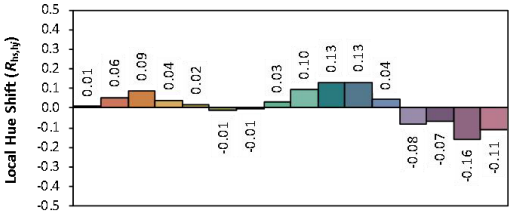
ANSI/IES TM-30-18 Color Rendition Report

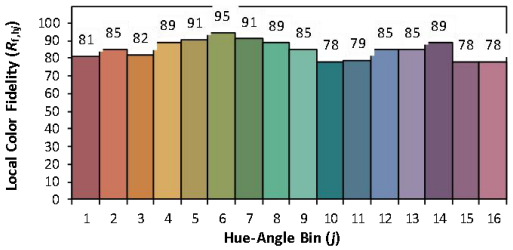
Source:	L128-3080RA35000H1 L128-5080RA35000H1	Manufacturer:	IKIO LED LIGHTING
Date:	2023/11/23	Model:	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)

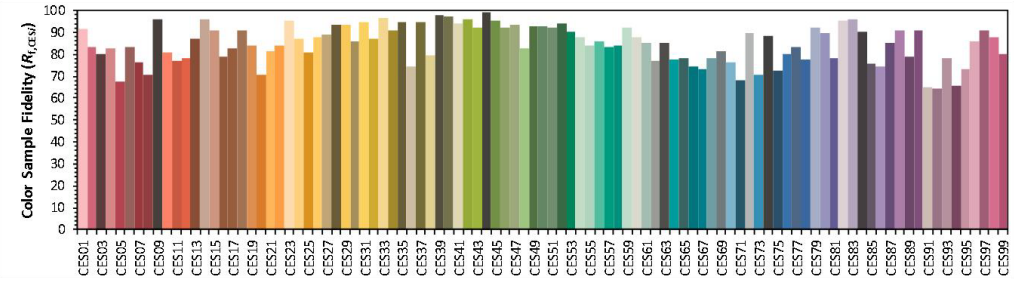












Notes:	This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3798
y	0.3702
u'	0.2273
v'	0.4986

CIE 13.3-1995 (CRI)	
R_a	86
R_9	20

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	2023-11-23	Test Ambient:	25.2 º C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC231103	120.0	60	0.162	19.44	0.997	5.03
0E-D1	277.0	60	0.081	20.12	0.897	22.14
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5201
Duv	0.0011
Chromaticity (x, y)	x=0.3398 y=0.3495
Chromaticity (u', v')	u(u')=0.2087v'=0.4829
Color Rendering Index (CRI)	84
R9	11
Rf	84
Rg	95
Rcs,h1(%)	-12

Special Color Rendering Indices			
R1	83	R9	11
R2	90	R10	75
R3	93	R11	83
R4	84	R12	60
R5	83	R13	85
R6	85	R14	97
R7	87	R15	78
R8	68	--	--
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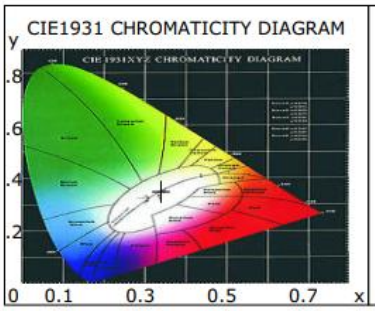
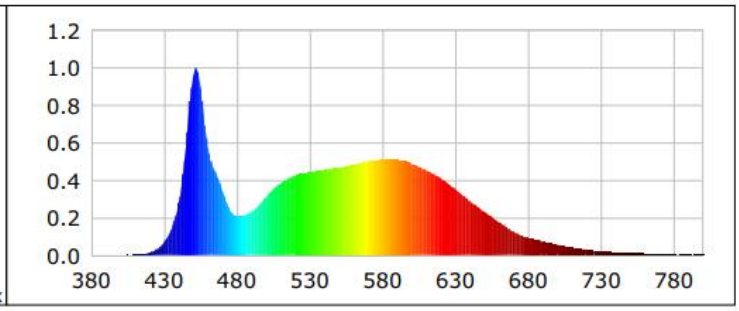
Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2982.8	2981.8	375 lm/ft (-10%)
Luminous Efficacy (lm/W)	153.44	148.20	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	148.20		

Spectral Power Distribution & Chromaticity Diagram



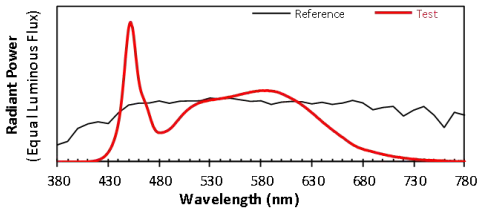


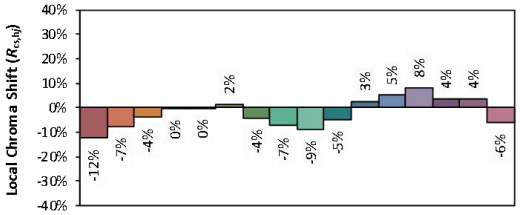
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0171	535	0.4352	39.9502	690	0.1253	11.5026
385	0.0007	0.0632	540	0.4421	40.5784	695	0.1052	9.6523
390	0.0008	0.0702	545	0.4474	41.0725	700	0.0926	8.4960
395	0.0006	0.0548	550	0.4541	41.6813	705	0.0824	7.5593
400	0.0008	0.0741	555	0.4587	42.1046	710	0.0723	6.6391
405	0.0016	0.1500	560	0.4657	42.7518	715	0.0633	5.8123
410	0.0020	0.1806	565	0.4735	43.4621	720	0.0536	4.9229
415	0.0061	0.5564	570	0.4831	44.3409	725	0.0458	4.2087
420	0.0143	1.3156	575	0.4919	45.1488	730	0.0391	3.5905
425	0.0319	2.9267	580	0.4996	45.8621	735	0.0332	3.0515
430	0.0688	6.3114	585	0.5060	46.4433	740	0.0283	2.6006
435	0.1413	12.9713	590	0.5101	46.8190	745	0.0244	2.2357
440	0.2798	25.6854	595	0.5108	46.8892	750	0.0213	1.9507
445	0.5827	53.4887	600	0.5080	46.6338	755	0.0163	1.4925
450	0.9551	87.6742	605	0.5014	46.0259	760	0.0154	1.4104
455	0.8987	82.4901	610	0.4890	44.8869	765	0.0141	1.2964
460	0.5821	53.4286	615	0.4720	43.3259	770	0.0120	1.0994
465	0.4476	41.0821	620	0.4544	41.7109	775	0.0102	0.9332
470	0.3464	31.7958	625	0.4332	39.7661	780	0.0072	0.6585
475	0.2438	22.3767	630	0.4097	37.6052	785	0.0062	0.5664
480	0.2091	19.1962	635	0.3818	35.0489	790	0.0066	0.6045
485	0.2136	19.6027	640	0.3517	32.2806	795	0.0044	0.4069
490	0.2326	21.3547	645	0.3203	29.4057	800	0.0036	0.3298
495	0.2689	24.6842	650	0.2885	26.4797			
500	0.3127	28.7059	655	0.2593	23.8018			
505	0.3522	32.3267	660	0.2305	21.1628			
510	0.3842	35.2710	665	0.2029	18.6256			
515	0.4080	37.4547	670	0.1773	16.2781			
520	0.4246	38.9771	675	0.1499	13.7565			
525	0.4352	39.9502	680	0.1253	11.5026			
530	0.4421	40.5784	685	0.1052	9.6523			

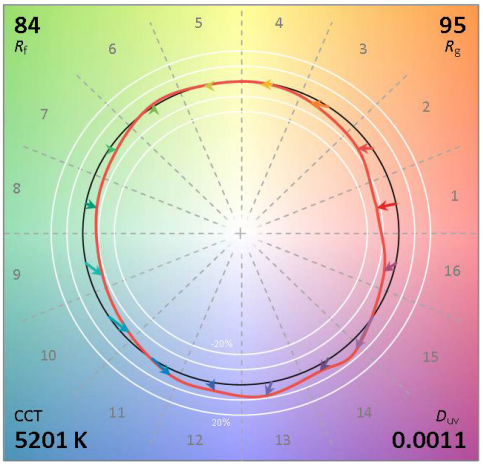
TM30

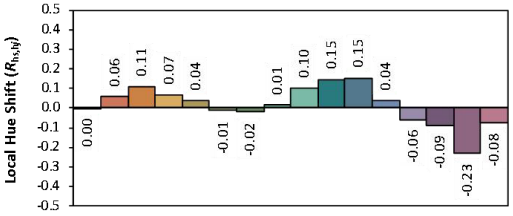
ANSI/IES TM-30-18 Color Rendition Report

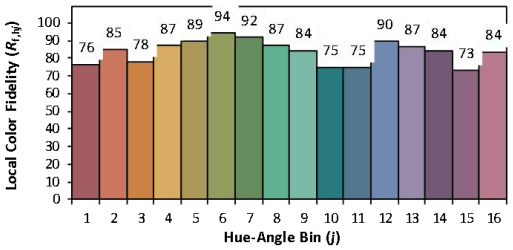
Source:	L128-5080RA35000H1	Manufacturer:	IKIO LED LIGHTING
Date:	2023/11/23	Model:	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (20W)

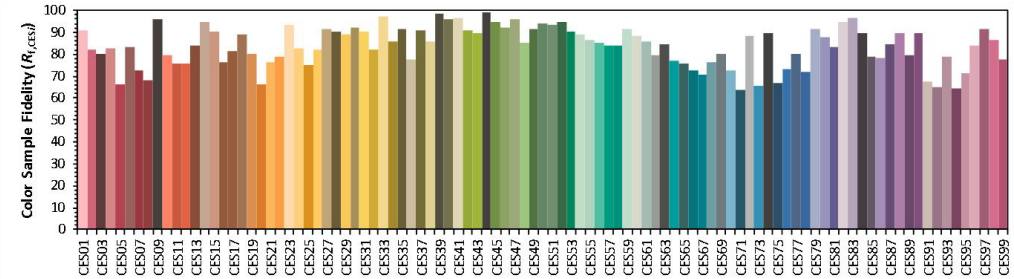












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3398
y	0.3495
u'	0.2087
v'	0.4829

CIE 13.3-1995 (CRI)

R_a	84
R_9	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
Goniophotometeric System	GPM-3000	DYHXF120001	2023-01-17
AC Power Source	CHP-500C	DYBWD010159	2023-01-18
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2023-02-01
Digital Power Meter	WT500	DYDWQ20010	2023-01-18
Integral Sphere (2M)	2M	DYJCE120067	2023-01-17
Digital Power Meter	WT500	DYDWQ200006	2023-01-18
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2023-01-17
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 ********