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 (30W)

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 (30W)
IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (30W)
IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (30W)

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 (30W)	
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	30W(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-E1	
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 (30W):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 (30W)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC231103 0E-E1	120.0	60	0.235	28.11	0.998	3.54
	277.0	60	0.107	28.64	0.962	15.12
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

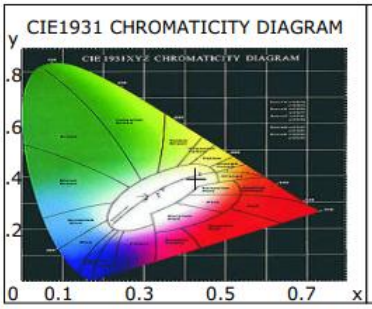
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3118
Duv	-0.0015
Chromaticity (x, y)	x=0.4268 y=0.3968
Chromaticity (u', v')	u(u')=0.2471 v'=0.5170
Color Rendering Index (CRI)	84
R9	12
Rf	85
Rg	95
Rcs,h1(%)	-11

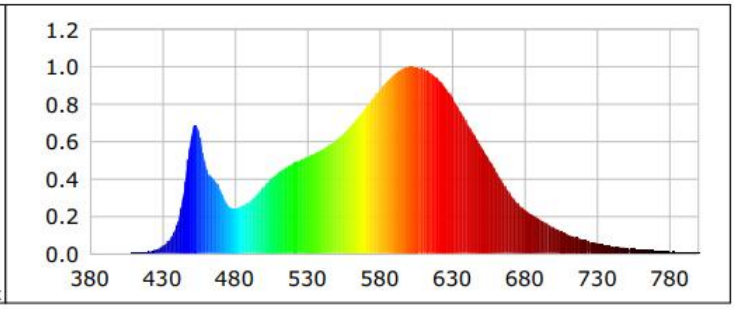
Special Color Rendering Indices			
R1	83	R9	12
R2	94	R10	86
R3	94	R11	82
R4	82	R12	73
R5	84	R13	86
R6	93	R14	98
R7	81	R15	76
R8	60	--	--
--	--	--	--
--	--	--	--

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)	3937.3	3975.7	375 lm/ft (-10%)
Luminous Efficacy (lm/W)	140.07	138.82	Standard: >= 115(-3%)
Most worst Luminous/Highest	137.48		
Zonal lumens in the 0-60° zone (%)	68.70	--	>=40(-3%)
Beam Angle (°)	118.1	--	--
Center Beam Candle Power (cd)	1183	--	--

Spectral Power Distribution & Chromaticity Diagram



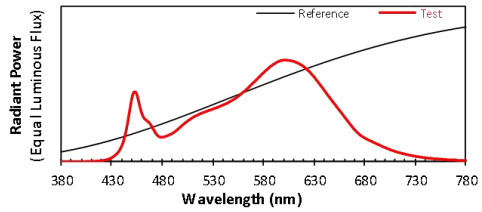


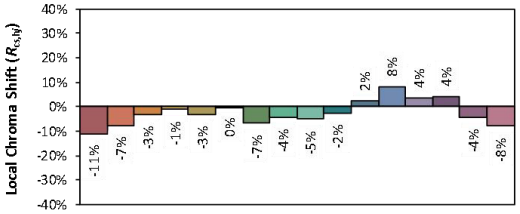
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0000	0.0016	535	0.4992	39.0342	690	0.3155	24.6669
385	0.0004	0.0335	540	0.5169	40.4181	695	0.2667	20.8545
390	0.0004	0.0300	545	0.5353	41.8579	700	0.2335	18.2606
395	0.0004	0.0348	550	0.5561	43.4812	705	0.2077	16.2377
400	0.0007	0.0538	555	0.5801	45.3586	710	0.1853	14.4860
405	0.0009	0.0739	560	0.6088	47.6007	715	0.1613	12.6102
410	0.0018	0.1407	565	0.6423	50.2194	720	0.1392	10.8825
415	0.0043	0.3355	570	0.6837	53.4554	725	0.1175	9.1900
420	0.0092	0.7195	575	0.7265	56.8039	730	0.1005	7.8605
425	0.0189	1.4765	580	0.7767	60.7313	735	0.0859	6.7172
430	0.0378	2.9529	585	0.8258	64.5659	740	0.0740	5.7834
435	0.0756	5.9081	590	0.8750	68.4136	745	0.0622	4.8620
440	0.1535	11.9992	595	0.9195	71.8936	750	0.0529	4.1351
445	0.3385	26.4677	600	0.9597	75.0373	755	0.0441	3.4516
450	0.6242	48.8087	605	0.9860	77.0940	760	0.0382	2.9857
455	0.6573	51.3974	610	0.9999	78.1846	765	0.0343	2.6837
460	0.4714	36.8583	615	0.9977	78.0118	770	0.0274	2.1461
465	0.4014	31.3894	620	0.9881	77.2631	775	0.0243	1.9033
470	0.3397	26.5651	625	0.9671	75.6213	780	0.0208	1.6277
475	0.2609	20.3986	630	0.9358	73.1703	785	0.0173	1.3560
480	0.2399	18.7587	635	0.8907	69.6458	790	0.0155	1.2088
485	0.2547	19.9119	640	0.8357	65.3425	795	0.0112	0.8750
490	0.2777	21.7102	645	0.7703	60.2323	800	0.0095	0.7432
495	0.3142	24.5690	650	0.7031	54.9762			
500	0.3588	28.0547	655	0.6371	49.8148			
505	0.3976	31.0846	660	0.5705	44.6058			
510	0.4330	33.8534	665	0.5062	39.5764			
515	0.4583	35.8373	670	0.4415	34.5191			
520	0.4815	37.6458	675	0.3759	29.3913			
525	0.4992	39.0342	680	0.3155	24.6669			
530	0.5169	40.4181	685	0.2667	20.8545			

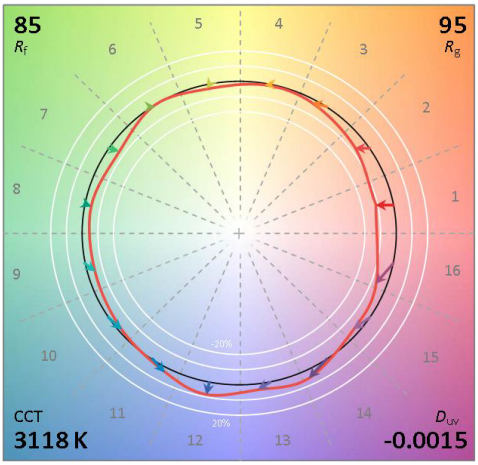
TM30

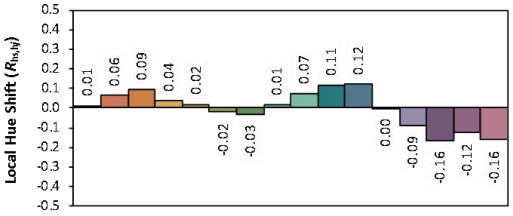
ANSI/IES TM-30-18 Color Rendition Report

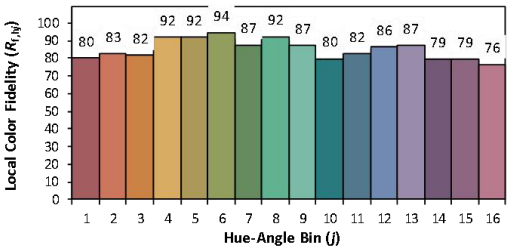
Source:	L128-3080RA35000H1	Manufacturer:	IKIO LED LIGHTING
Date:	2023/11/23	Model:	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (30W)

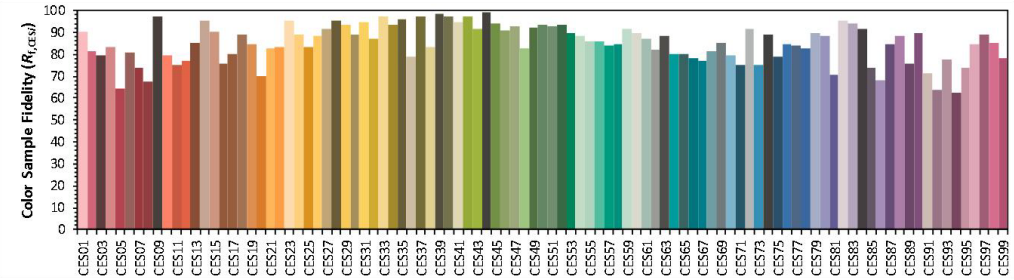












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4268
y	0.3968
u'	0.2471
v'	0.5169

CIE 13.3-1995 (CRI)

R_a	84
R_9	12

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

Zonal Lumen Tabulation

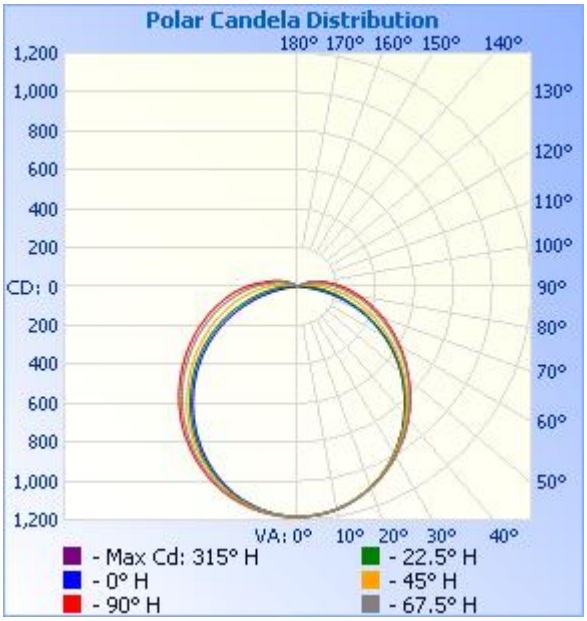
Zonal Lumen Summary

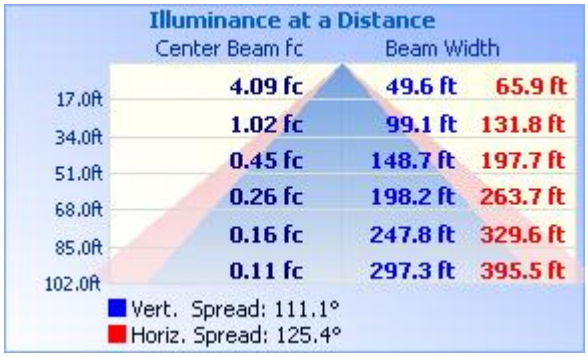
Zone	Lumens	% Lamp	% Luminaire
0-30	919.6	23.4%	23.4%
0-40	1,508.7	38.3%	38.3%
0-60	2,705.8	68.7%	68.7%
60-90	1,032.3	26.2%	26.2%
70-100	662.8	16.8%	16.8%
90-120	181.9	4.6%	4.6%
0-90	3,738.1	94.9%	94.9%
90-180	199.0	5.1%	5.1%
0-180	3,937.1	100%	100%

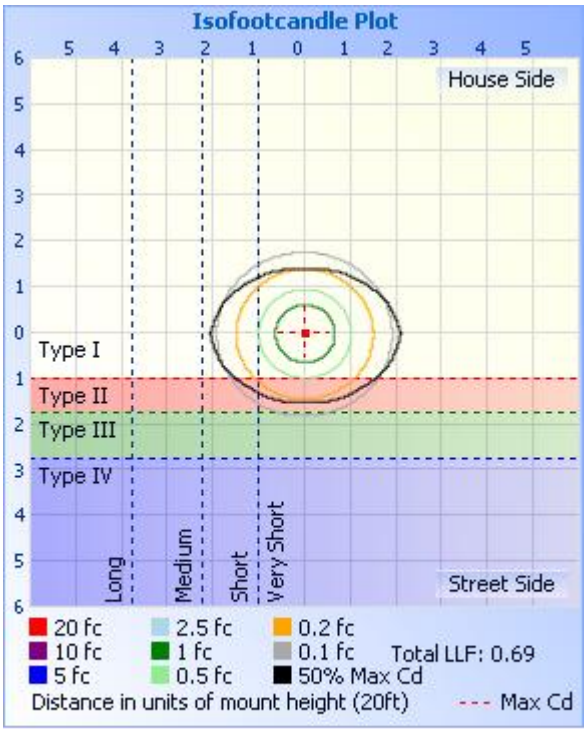
Lumens Per Zone

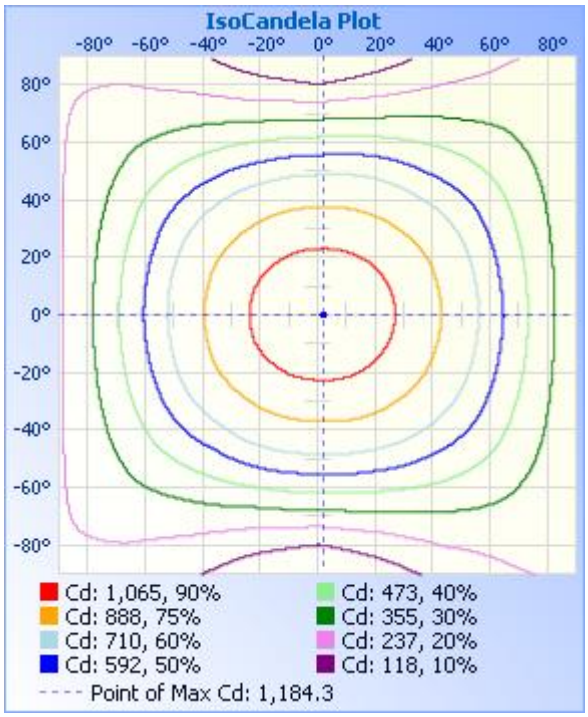
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	112.0	2.8%	90-100	109.8	2.8%
10-20	320.8	8.1%	100-110	52.6	1.3%
20-30	486.9	12.4%	110-120	19.6	0.5%
30-40	589.1	15.0%	120-130	6.1	0.2%
40-50	618.8	15.7%	130-140	4.0	0.1%
50-60	578.3	14.7%	140-150	3.1	0.1%
60-70	479.3	12.2%	150-160	2.2	0.1%
70-80	344.5	8.7%	160-170	1.3	0%
80-90	208.6	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	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183
1	1184	1183	1184	1183	1183	1183	1182	1182	1183	1182	1183	1183	1183	1183	1184	1183	1184
2	1183	1181	1183	1182	1182	1182	1182	1182	1182	1181	1183	1183	1184	1183	1183	1183	1183
3	1183	1181	1182	1180	1180	1180	1180	1180	1180	1181	1182	1182	1184	1183	1183	1183	1183
4	1181	1179	1179	1179	1178	1178	1178	1179	1178	1178	1180	1181	1183	1182	1182	1182	1181
5	1179	1177	1177	1177	1176	1176	1176	1175	1176	1177	1178	1180	1181	1181	1181	1180	1179
6	1177	1175	1175	1174	1173	1173	1173	1173	1173	1174	1177	1178	1180	1180	1179	1178	1177
7	1174	1172	1172	1171	1172	1171	1170	1170	1170	1172	1174	1175	1177	1177	1177	1175	1174
8	1171	1169	1168	1168	1168	1168	1166	1166	1166	1168	1170	1173	1175	1175	1175	1173	1171
9	1167	1165	1165	1164	1164	1163	1162	1162	1162	1164	1167	1171	1173	1172	1171	1169	1167
10	1163	1161	1161	1161	1160	1160	1158	1158	1156	1160	1163	1167	1170	1170	1168	1166	1163
11	1159	1156	1156	1156	1155	1155	1153	1152	1152	1155	1159	1164	1167	1166	1164	1162	1159
12	1155	1150	1151	1152	1151	1150	1148	1147	1146	1150	1154	1160	1163	1161	1159	1156	1155
13	1148	1145	1145	1147	1145	1145	1142	1140	1140	1144	1150	1154	1159	1158	1156	1152	1148
14	1142	1139	1140	1141	1140	1139	1135	1134	1135	1138	1144	1150	1154	1153	1149	1146	1142
15	1135	1133	1134	1136	1134	1133	1129	1128	1128	1132	1138	1144	1149	1148	1144	1140	1135
16	1130	1126	1127	1129	1128	1127	1123	1121	1120	1126	1131	1139	1144	1143	1138	1134	1130
17	1122	1119	1121	1124	1122	1121	1115	1113	1112	1118	1126	1132	1139	1137	1132	1126	1122
18	1115	1112	1113	1117	1115	1113	1108	1105	1104	1110	1118	1126	1133	1131	1126	1120	1115
19	1107	1104	1106	1108	1108	1107	1099	1096	1095	1103	1110	1120	1127	1125	1119	1111	1107
20	1098	1096	1097	1101	1100	1098	1091	1088	1087	1094	1103	1113	1121	1118	1111	1104	1098
21	1089	1087	1089	1092	1092	1091	1081	1079	1078	1085	1095	1106	1113	1111	1104	1096	1089
22	1080	1077	1080	1084	1084	1082	1073	1070	1067	1076	1087	1098	1106	1103	1096	1086	1080
23	1071	1069	1070	1076	1075	1073	1063	1059	1058	1067	1077	1090	1099	1096	1087	1077	1071
24	1060	1059	1061	1068	1067	1064	1053	1049	1047	1056	1069	1081	1091	1088	1078	1068	1060
25	1051	1049	1051	1058	1058	1054	1043	1038	1037	1048	1058	1072	1082	1079	1068	1057	1051
26	1040	1039	1040	1047	1048	1045	1032	1028	1024	1036	1049	1064	1073	1070	1059	1047	1040
27	1029	1028	1029	1037	1038	1035	1022	1016	1013	1025	1039	1055	1064	1061	1048	1036	1029
28	1017	1017	1020	1026	1028	1025	1011	1004	1002	1014	1029	1044	1055	1052	1038	1025	1017

29	1005	1004	1008	1016	1017	1014	998	992	989	1003	1018	1034	1045	1042	1028	1013	1005
30	993	993	997	1005	1006	1003	986	979	977	991	1005	1024	1036	1032	1017	1001	993
31	981	981	984	995	995	991	975	966	964	978	994	1014	1026	1022	1005	989	981
32	968	967	972	983	982	979	962	952	949	965	982	1003	1015	1011	994	976	968
33	954	953	959	971	971	968	949	938	935	953	970	990	1004	1000	982	965	954
34	940	941	946	959	962	955	936	925	924	939	958	979	994	989	969	951	940
35	926	928	933	947	950	943	921	914	911	926	943	967	982	977	958	937	926
36	916	916	919	933	938	928	909	898	896	913	929	956	970	966	944	925	916
37	899	901	909	922	923	917	897	884	880	898	919	943	961	953	930	914	899
38	885	886	894	910	912	906	882	869	866	884	906	928	949	941	916	899	885
39	870	871	879	896	899	891	865	855	851	869	892	918	936	928	903	884	870
40	854	856	866	884	886	878	851	840	836	855	877	907	923	916	890	870	854
41	840	842	851	869	873	864	835	826	821	840	862	893	913	905	876	855	840
42	824	826	838	856	860	849	821	811	806	824	848	880	899	891	862	842	824
43	808	811	822	843	846	835	806	795	789	809	833	866	886	878	846	826	808
44	793	795	807	829	833	822	789	781	773	794	818	853	873	864	833	812	793
45	777	779	793	815	819	806	774	766	759	778	803	840	861	850	818	797	777
46	761	762	776	800	805	791	758	750	742	761	789	826	846	837	802	782	761
47	745	747	762	786	791	777	742	734	725	746	773	813	833	823	786	767	745
48	731	731	745	772	777	763	726	718	709	731	759	798	820	809	771	752	731
49	713	715	730	757	763	748	709	702	692	714	742	784	806	794	756	737	713
50	696	698	714	742	748	732	693	686	676	698	727	771	792	779	740	722	696
51	681	681	698	729	734	717	677	671	658	681	712	757	778	767	723	706	681
52	663	663	682	712	720	702	661	652	640	665	696	743	765	751	708	689	663
53	645	647	666	698	705	687	645	635	623	648	682	727	749	737	691	675	645
54	627	629	650	683	692	672	628	618	606	631	665	713	737	722	676	658	627
55	609	611	632	667	678	655	612	600	588	612	650	698	722	707	661	642	609
56	591	593	616	654	662	641	596	581	569	596	635	683	708	692	645	624	591
57	572	577	601	639	649	626	579	563	550	579	619	668	694	677	629	606	572
58	555	559	585	623	635	611	564	544	532	561	604	654	680	663	613	588	555
59	535	540	567	609	621	594	548	526	514	543	587	640	667	646	598	571	535

60	516	522	552	594	607	579	532	508	495	525	572	625	653	632	583	552	516
61	498	505	535	579	592	565	517	487	475	508	556	611	640	617	567	534	498
62	479	486	520	564	578	550	500	469	456	490	539	596	625	602	551	516	479
63	459	469	504	549	564	535	485	451	438	471	524	582	610	588	535	496	459
64	440	450	486	534	551	520	470	432	419	454	508	567	597	573	520	478	440
65	421	432	472	519	536	506	456	413	397	436	494	552	583	558	505	460	421
66	401	413	457	504	522	492	441	393	378	418	478	537	570	543	489	441	401
67	383	397	441	490	508	478	424	375	359	401	463	523	556	529	476	423	383
68	362	377	425	475	495	464	410	358	339	382	448	510	542	516	460	404	362
69	343	359	410	461	481	450	395	337	318	364	433	496	528	499	446	385	343
70	323	339	395	446	467	436	380	320	299	346	418	480	514	486	430	366	323
71	302	322	380	432	455	423	363	302	280	328	403	466	500	472	414	348	302
72	282	305	365	418	441	407	349	285	260	309	388	453	487	459	400	330	282
73	264	287	352	405	428	395	334	268	240	291	374	439	475	445	385	313	264
74	245	270	336	391	415	382	320	250	220	274	360	424	462	432	370	295	245
75	225	253	322	377	402	369	305	235	201	258	345	410	447	418	355	277	225
76	204	236	309	363	390	357	292	220	182	243	331	397	435	404	341	261	204
77	185	220	295	351	377	343	278	204	164	226	318	383	422	391	326	245	185
78	167	207	281	338	363	330	265	188	145	211	304	371	409	377	313	229	167
79	148	190	268	325	352	317	252	174	127	197	291	356	397	365	298	214	148
80	131	176	254	313	340	305	238	160	110	183	276	343	384	352	284	198	131
81	112	162	241	299	327	293	227	148	92	169	264	330	372	339	271	182	112
82	95	149	229	287	315	280	215	134	77	155	251	318	359	325	258	168	95
83	80	136	216	275	304	268	204	122	63	142	238	304	347	314	245	154	80
84	65	123	204	264	293	257	192	110	50	130	225	292	335	301	232	142	65
85	52	112	193	252	281	245	181	99	38	118	212	281	324	290	220	128	52
86	39	100	182	241	270	234	171	90	27	106	200	269	311	277	209	116	39
87	29	90	170	231	259	224	161	79	19	96	189	257	299	265	197	104	29
88	20	80	160	221	249	214	150	71	13	86	177	246	288	254	186	93	20
89	13	71	151	211	239	204	141	64	10	77	167	235	275	242	175	83	13
90	8	64	142	201	228	193	132	57	9	67	157	224	263	231	164	74	8

91	7	56	133	192	218	184	124	49	8	59	146	213	252	218	152	66	7
92	7	50	125	183	208	175	115	43	8	51	136	201	239	206	142	57	7
93	6	43	117	174	199	166	108	38	7	44	124	190	226	194	131	48	6
94	6	37	109	165	189	158	101	33	7	38	113	179	214	182	120	40	6
95	6	33	101	157	180	150	94	29	7	33	103	167	202	172	111	35	6
96	5	28	94	150	171	142	88	24	6	29	95	155	190	160	101	31	5
97	5	25	86	142	163	135	80	21	6	25	89	146	178	150	94	26	5
98	5	21	80	134	153	127	74	17	5	22	84	137	167	140	86	23	5
99	2	18	73	127	146	120	67	15	4	19	80	130	157	132	81	20	2
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112	2	5	16	46	56	42	13	4	1	4	21	55	71	57	22	4	2
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114	2	4	11	37	46	33	9	4	2	4	14	45	60	46	15	4	2
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120	3	4	6	14	20	12	6	4	3	3	7	20	31	20	6	3	3
121	3	4	7	12	17	10	6	4	3	4	7	16	27	17	7	5	3

122	2	4	6	9	14	9	6	4	3	4	7	13	22	15	6	3	2
123	3	3	6	9	12	8	6	4	3	3	6	11	19	12	6	4	3
124	3	4	6	8	10	8	6	4	2	3	6	9	16	10	6	3	3
125	3	4	6	8	9	7	6	4	3	4	7	8	14	9	6	4	3
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179	4	5	4	4	4	5	4	5	4	5	5	5	4	4	4	4	4
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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 º C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (30W)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC231103 0E-E1	120.0	60	0.229	27.42	0.998	3.37
	277.0	60	0.103	27.52	0.963	15.25
				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)	3981
Duv	-0.0028
Chromaticity (x, y)	x=0.3794 y=0.3702
Chromaticity (u', v')	u(u')=0.2270 v'=0.4985
Color Rendering Index (CRI)	86
R9	20
Rf	85
Rg	95
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	85	R9	20
R2	93	R10	84
R3	96	R11	84
R4	81	R12	65
R5	86	R13	88
R6	90	R14	99
R7	85	R15	80
R8	67	--	--
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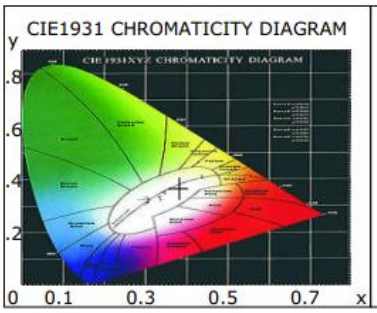
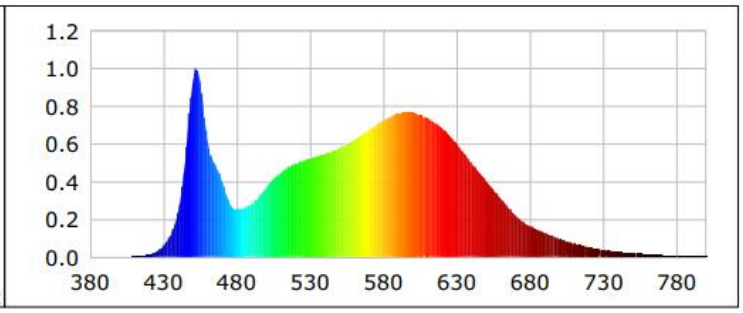
Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	4160.7	4270.0	375 lm/ft (-10%)
Luminous Efficacy (lm/W)	151.74	155.16	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	151.19		

Spectral Power Distribution & Chromaticity Diagram



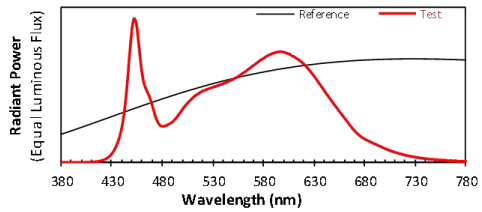


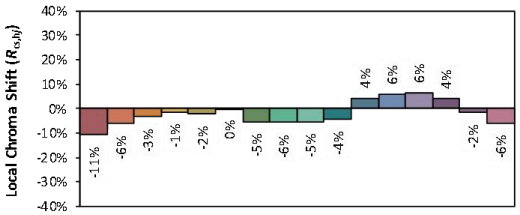
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.0391	535	0.5103	48.7355	690	0.2206	21.0662
385	0.0005	0.0468	540	0.5213	49.7895	695	0.1862	17.7839
390	0.0005	0.0493	545	0.5328	50.8923	700	0.1633	15.5978
395	0.0005	0.0459	550	0.5463	52.1775	705	0.1453	13.8755
400	0.0008	0.0735	555	0.5610	53.5857	710	0.1285	12.2716
405	0.0011	0.1039	560	0.5784	55.2399	715	0.1122	10.7189
410	0.0017	0.1669	565	0.5971	57.0259	720	0.0962	9.1857
415	0.0051	0.4873	570	0.6218	59.3857	725	0.0825	7.8830
420	0.0126	1.1991	575	0.6471	61.8085	730	0.0698	6.6694
425	0.0274	2.6197	580	0.6729	64.2752	735	0.0600	5.7268
430	0.0580	5.5359	585	0.6997	66.8345	740	0.0511	4.8791
435	0.1196	11.4239	590	0.7237	69.1259	745	0.0439	4.1962
440	0.2392	22.8510	595	0.7442	71.0793	750	0.0364	3.4746
445	0.5162	49.3005	600	0.7593	72.5196	755	0.0298	2.8468
450	0.9214	88.0023	605	0.7683	73.3871	760	0.0264	2.5262
455	0.9370	89.4912	610	0.7663	73.1883	765	0.0231	2.2077
460	0.6256	59.7557	615	0.7532	71.9402	770	0.0194	1.8496
465	0.4939	47.1743	620	0.7363	70.3246	775	0.0169	1.6172
470	0.4010	38.3000	625	0.7132	68.1161	780	0.0142	1.3577
475	0.2896	27.6640	630	0.6837	65.3006	785	0.0115	1.1014
480	0.2507	23.9457	635	0.6445	61.5574	790	0.0116	1.1125
485	0.2596	24.7994	640	0.6008	57.3869	795	0.0089	0.8499
490	0.2802	26.7631	645	0.5507	52.6028	800	0.0083	0.7966
495	0.3188	30.4496	650	0.4998	47.7337			
500	0.3681	35.1581	655	0.4506	43.0395			
505	0.4114	39.2914	660	0.4018	38.3730			
510	0.4480	42.7907	665	0.3549	33.8971			
515	0.4752	45.3871	670	0.3099	29.5960			
520	0.4961	47.3823	675	0.2631	25.1276			
525	0.5103	48.7355	680	0.2206	21.0662			
530	0.5213	49.7895	685	0.1862	17.7839			

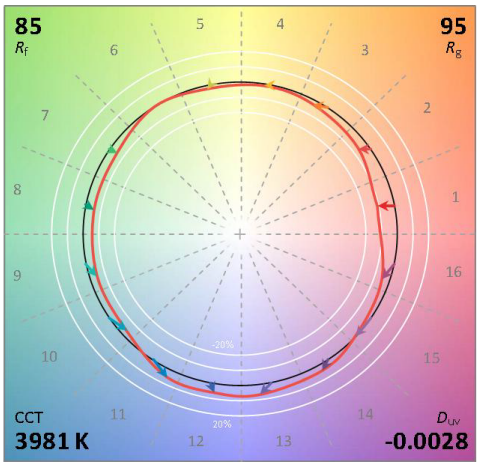
TM30

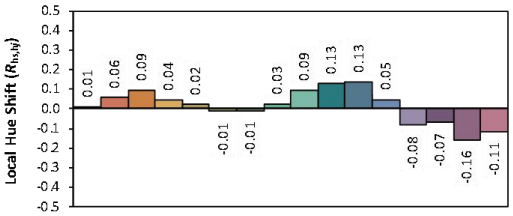
ANSI/IES TM-30-18 Color Rendition Report

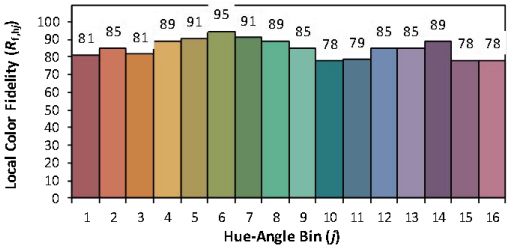
Source:	L128-3080RA35000H1 L128-5080RA35000H1	Manufacturer:	IKIO LED LIGHTING
Date:	2023/11/23	Model:	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (30W)

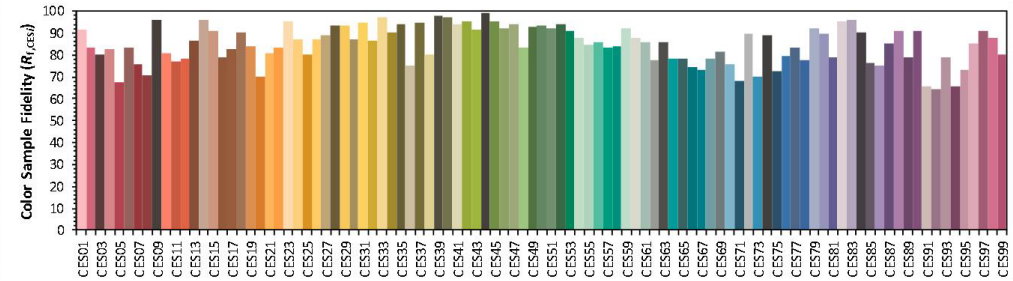












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3794
y	0.3702
u'	0.2270
v'	0.4985

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 (30W)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC231103 0E-E1	120.0	60	0.235	28.18	0.998	3.59
	277.0	60	0.108	28.7	0.963	15.03
				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)	5204
Duv	0.0011
Chromaticity (x, y)	x=0.3398 y=0.3494
Chromaticity (u', v')	u(u')=0.2086v'=0.4828
Color Rendering Index (CRI)	84
R9	10
Rf	84
Rg	96
Rcs,h1(%)	-12

Special Color Rendering Indices			
R1	83	R9	10
R2	89	R10	74
R3	93	R11	83
R4	84	R12	60
R5	83	R13	85
R6	85	R14	96
R7	87	R15	78
R8	68	--	--
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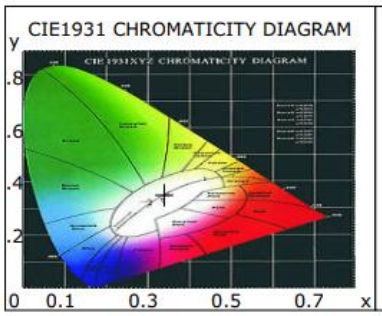
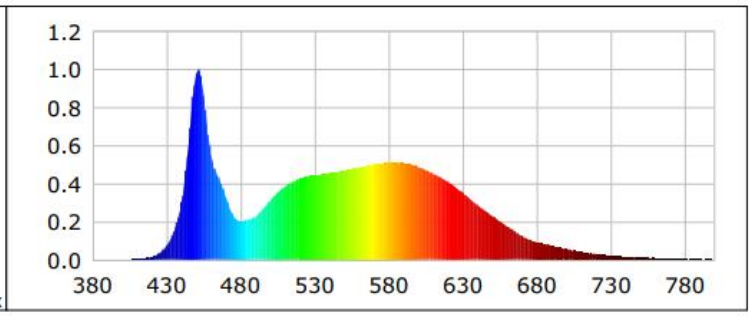
Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	4185.9	4184.2	375 lm/ft (-10%)
Luminous Efficacy (lm/W)	148.54	145.79	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	145.79		

Spectral Power Distribution & Chromaticity Diagram



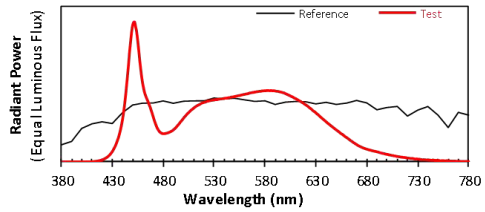


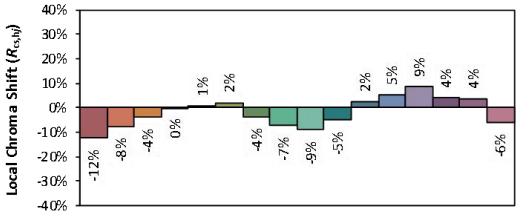
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0312	535	0.4367	57.1447	690	0.1252	16.3888
385	0.0007	0.0931	540	0.4424	57.8934	695	0.1052	13.7687
390	0.0006	0.0722	545	0.4489	58.7500	700	0.0914	11.9624
395	0.0005	0.0685	550	0.4549	59.5353	705	0.0811	10.6073
400	0.0008	0.0991	555	0.4601	60.2059	710	0.0726	9.5047
405	0.0015	0.1901	560	0.4673	61.1597	715	0.0631	8.2523
410	0.0024	0.3078	565	0.4745	62.1004	720	0.0545	7.1314
415	0.0065	0.8506	570	0.4831	63.2241	725	0.0462	6.0452
420	0.0156	2.0409	575	0.4927	64.4831	730	0.0398	5.2027
425	0.0345	4.5144	580	0.5002	65.4605	735	0.0343	4.4827
430	0.0741	9.6963	585	0.5057	66.1790	740	0.0280	3.6626
435	0.1519	19.8767	590	0.5094	66.6665	745	0.0250	3.2728
440	0.3011	39.3984	595	0.5095	66.6825	750	0.0207	2.7122
445	0.6217	81.3648	600	0.5079	66.4707	755	0.0160	2.0915
450	0.9765	127.7901	605	0.5004	65.4819	760	0.0149	1.9510
455	0.8670	113.4601	610	0.4890	63.9903	765	0.0145	1.9012
460	0.5555	72.6985	615	0.4719	61.7621	770	0.0104	1.3630
465	0.4332	56.6872	620	0.4534	59.3319	775	0.0098	1.2809
470	0.3281	42.9384	625	0.4327	56.6288	780	0.0084	1.0946
475	0.2315	30.2929	630	0.4090	53.5212	785	0.0063	0.8242
480	0.2022	26.4671	635	0.3810	49.8618	790	0.0056	0.7369
485	0.2095	27.4133	640	0.3513	45.9750	795	0.0041	0.5302
490	0.2297	30.0602	645	0.3193	41.7798	800	0.0039	0.5132
495	0.2675	35.0050	650	0.2879	37.6827			
500	0.3129	40.9465	655	0.2571	33.6438			
505	0.3526	46.1436	660	0.2296	30.0433			
510	0.3858	50.4895	665	0.2017	26.3968			
515	0.4086	53.4771	670	0.1755	22.9734			
520	0.4259	55.7392	675	0.1491	19.5063			
525	0.4367	57.1447	680	0.1252	16.3888			
530	0.4424	57.8934	685	0.1052	13.7687			

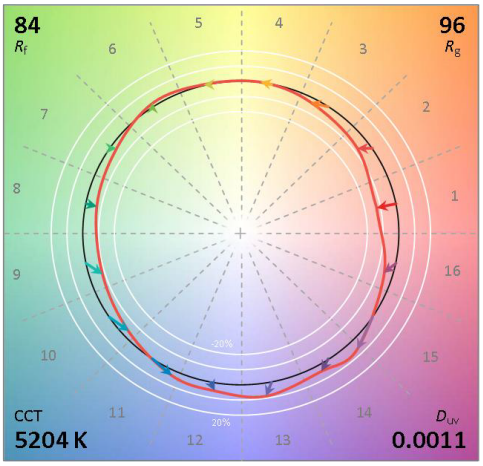
TM30

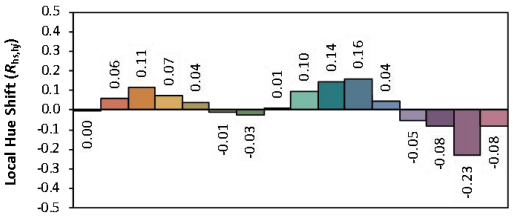
ANSI/IES TM-30-18 Color Rendition Report

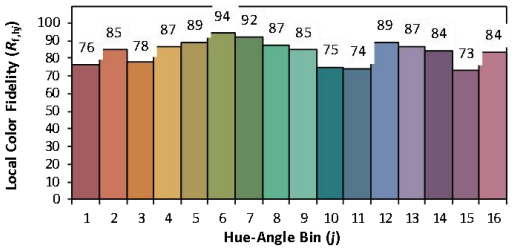
Source:	L128-5080RA35000H1	Manufacturer:	IKIO LED LIGHTING
Date:	2023/11/23	Model:	IK-TPS1-40/30/20W4FTBTB1A2-GRD30/40/50 (30W)

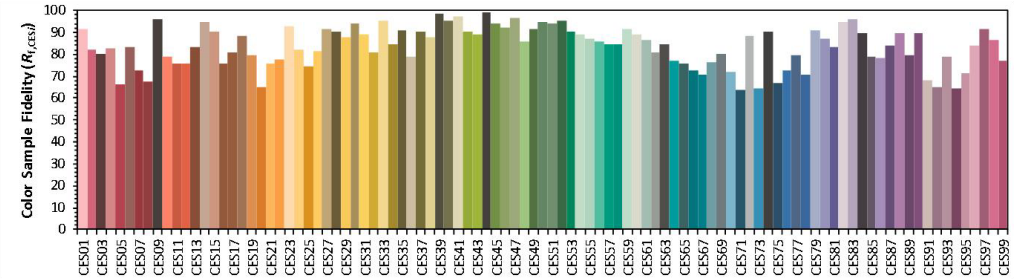












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3398
y	0.3494
u'	0.2086
v'	0.4828

CIE 13.3-1995 (CRI)

R_a	84
R_9	10

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 ********