LM-79-19 TEST REPORT

for

Beyond LED Technology

Double Ring LED Down Light

Model: SL-IB2835FTA-31KAHH

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

Report No.:HZ23060017c/R1

This report is replaced the old report No. HZ23060017c dated Jul. 11, 2023

The laboratory that conducted the testing detailed in this report has been accredited for SSL by NVLAP.

Review by: Wei Fei

Engineer: Wei Fei
Jul. 11, 2023

Approved by: April Zou

Manager: April Zou
Jul. 11, 2023

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

TEST SUMMARY

Sample Tested: **FXF23004-A001**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
86.6	2572.3	29.70	0.9046

CCT (K)	CRI	Stabilization Time (Light & Power)
2671	82.9	50 mins

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: Jun. 15, 2023
Date of Test	: Jul. 01, 2023
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	: IESNA LM-79-2019 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

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SAMPLE PHOTO

Figure 1- Overview of the sample

Equipment Under Test(EUT)	
Name	: Double Ring LED Down Light
Model	: SL-IB2835FTA-31KAHH
Electrical Ratings	: 120V,60Hz
Product Description	: White tunable for 2700K/3000K/3500K/4000K/5000K, 80CRI Tunable wattage for 16W/22W/30W.
Manufacturer	: Beyond LED Technology

TEST RESULTS

Test ambient temperature was24.6°C.

Test orientation was base up. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was50 minutes, and the total operating time including stabilization was 70 minutes.

The photometric distance is 2.47m.

Luminous data was taken at 0.5°vertical intervals and 10°horizontal intervals.

Parameter	Result
Test Voltage (V)	120.0
Voltage frequency (Hz)	60
Test Current (A)	0.274
Power Factor	0.9046
Test Power (W)	29.70
THD A%	46.22
Luminous Efficacy (lm/W)	86.6
Total Luminous Flux (lm)	2572.3
Color Rendering Index (CRI)	82.9
R9	10
Correlated Color Temperature (CCT) (K)	2671
Chromaticity (Chroma x, Chroma y)	(0.4587, 0.4048)
Chromaticity (Chroma u, Chroma v)	(0.2644, 0.3500)
Chromaticity (Chroma u', Chroma v')	(0.2644, 0.5250)
Duv	-0.0020
Average Beam Angle (°)	119.2
Center Beam Candle Power (cd)	735
Spacing Criteria	1.32 (0°-180°)/ 1.30(90°-270°)
Zonal Lumens in the 0°-60°Zone	67.35%
Zonal Lumens in the 60°-90°Zone	25.74%
Zonal Lumens in the 90°-120°Zone	5.39%
Zonal Lumens in the 120°-180°Zone	1.53%

Special Color Rendering Indices	
R1	82
R2	92
R3	95
R4	81
R5	82
R6	92
R7	81
R8	58
R9	10
R10	83
R11	81
R12	78
R13	85
R14	98

Table 2: Test data per Goniophotometer Method

Spectral Power Distribution- Goniophotometer Method

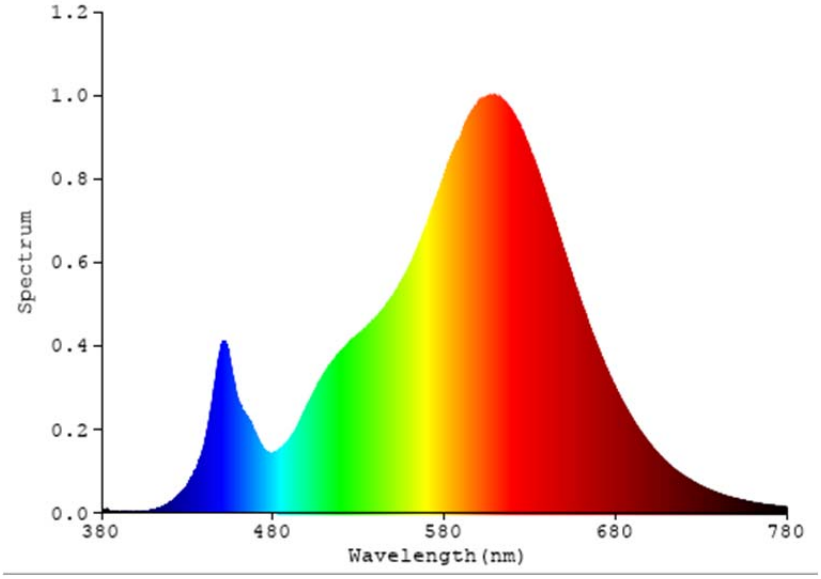


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation- Goniophotometer Method

γ(°)	Lumens	% Total
0- 10	69.619	2.71%
10- 20	200.568	7.80%
20- 30	307.861	11.97%
30- 40	378.221	14.70%
40- 50	401.669	15.62%
50- 60	374.392	14.55%
60- 70	305.422	11.87%
70- 80	218.762	8.50%
80- 90	138.012	5.37%
90-100	70.897	2.76%
100-110	37.532	1.46%
110-120	30.11	1.17%
120-130	20.675	0.80%
130-140	10.907	0.42%
140-150	4.725	0.18%
150-160	1.978	0.08%
160-170	0.796	0.03%
170-180	0.166	0.01%
Total	2572.3	100%

γ(°)	Lumens	% Total
0- 60	1732.33	67.35%
60- 90	662.196	25.74%
0-90	2394.53	93.09%
90- 180	177.786	6.91%
0- 180	2572.3	100%

Table 3: Zonal Lumen Data

Illuminance Plots- Goniophotometer Method

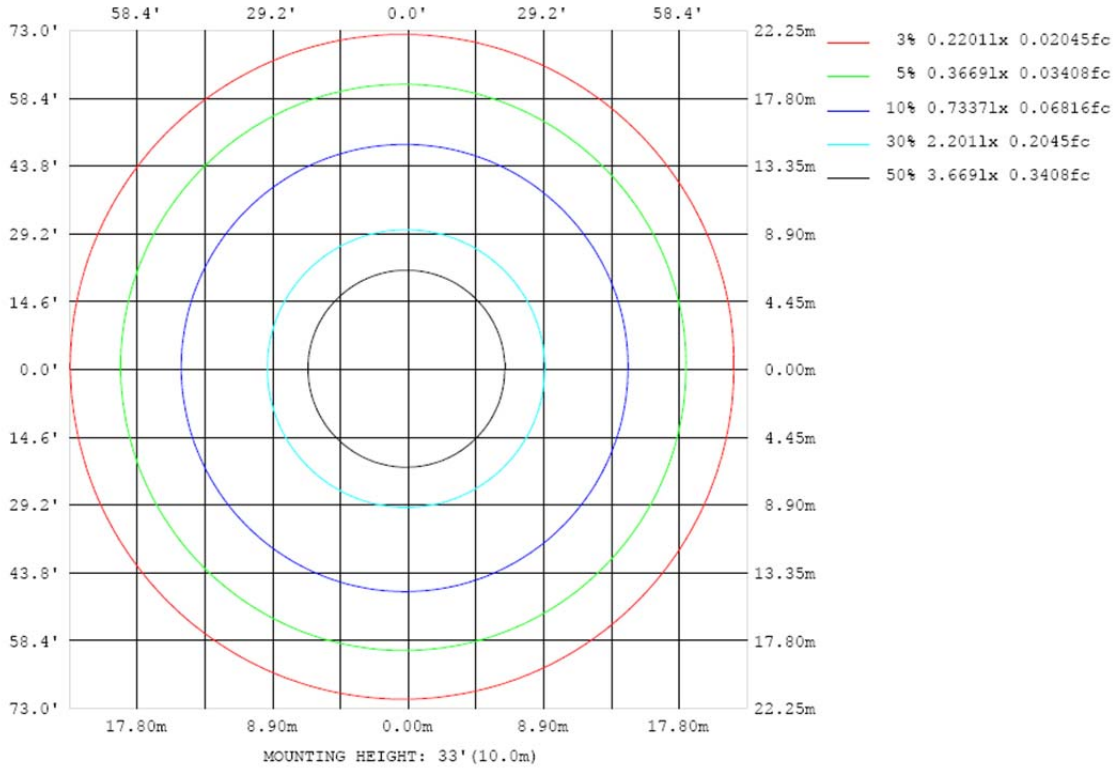


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

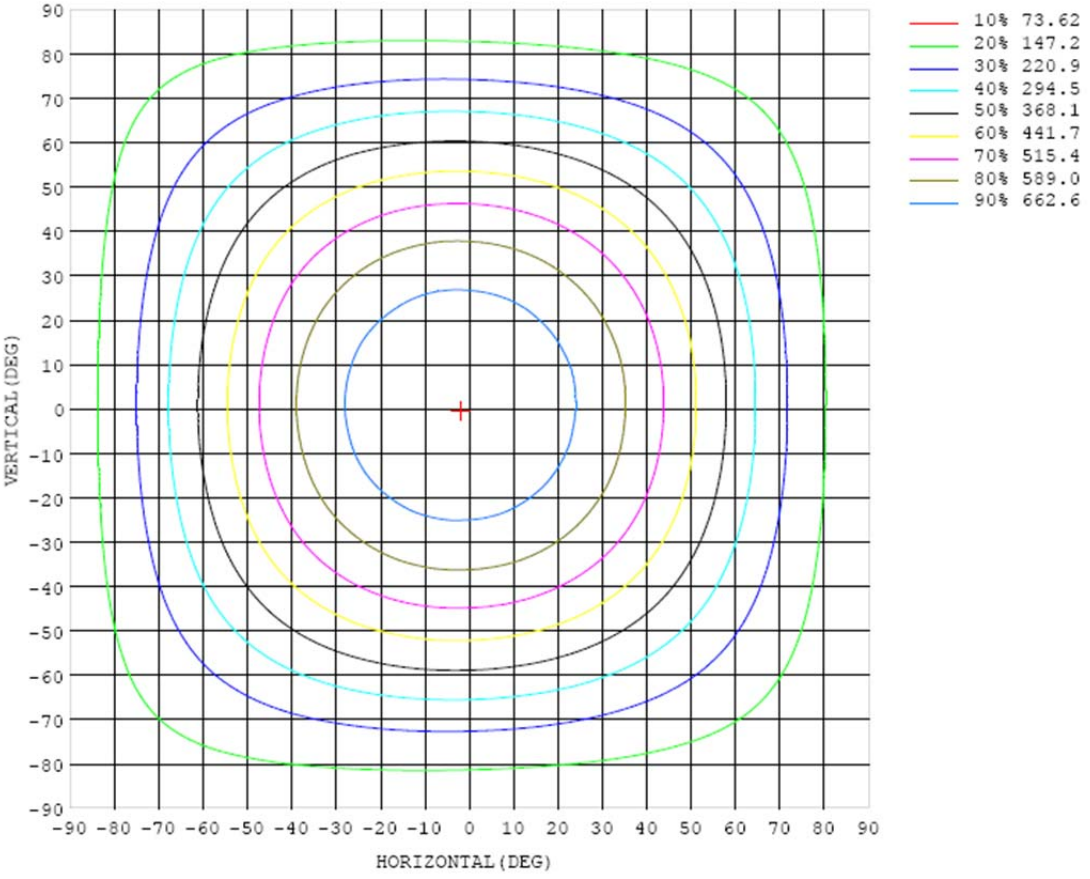
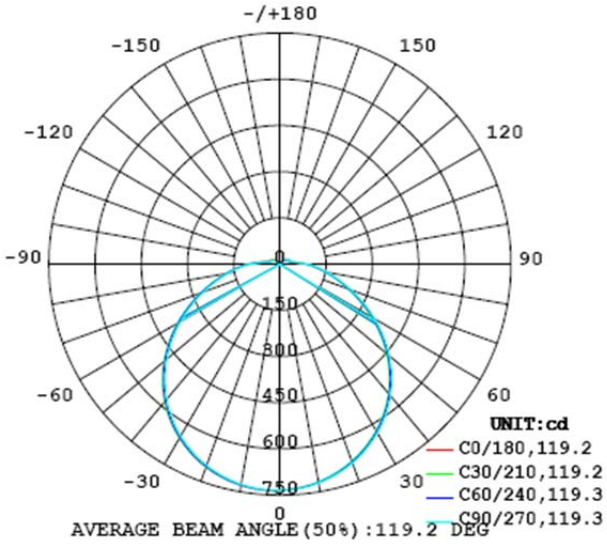


Chart 3: Isocandela Plot



Luminous Intensity Data- Goniophotometer Method

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735
5	730	729	730	729	730	731	730	730	731	731	732	732	733	733	734	734	732	734	736
10	719	719	719	719	719	720	719	721	721	722	723	724	724	727	726	727	727	728	730
15	704	702	703	702	704	704	704	705	706	707	709	710	711	711	714	714	713	715	718
20	683	682	682	681	683	684	683	685	686	688	689	691	692	694	696	698	699	699	702
25	659	656	656	655	657	658	659	660	661	663	665	667	669	670	673	675	674	677	680
30	625	625	626	624	626	626	627	630	631	633	636	638	641	642	645	647	648	649	653
35	591	590	590	589	590	592	592	595	596	598	602	603	605	608	612	614	614	617	620
40	551	548	549	548	550	551	552	554	557	559	562	564	567	569	573	575	577	578	582
45	504	503	503	503	505	506	507	509	511	513	517	520	522	526	529	531	533	535	539
50	454	452	453	452	454	456	457	459	462	465	468	470	474	476	480	483	485	487	491
55	401	399	399	399	401	402	403	406	408	411	414	417	420	424	427	430	432	434	438
60	345	343	343	343	345	346	348	351	353	356	359	362	365	368	372	374	377	379	383
65	290	288	288	288	290	291	293	295	297	300	303	306	309	312	315	318	320	323	327
70	238	237	237	236	237	239	240	242	245	247	250	252	255	258	261	264	266	268	272
75	191	190	190	190	191	192	193	195	197	199	202	204	206	209	212	214	216	218	222
80	150	150	150	150	151	151	153	154	156	157	159	161	163	166	168	171	172	174	177
85	114	114	114	115	116	116	117	118	120	121	123	125	127	129	130	132	134	135	139
90	81.9	82.3	82.7	83.5	84.5	85.2	86.3	87.3	88.6	90.0	91.6	92.9	94.2	95.7	96.9	98.7	99.6	101	103
95	56.2	56.8	57.2	58.1	58.7	59.6	60.3	61.1	62.3	63.5	64.5	65.5	66.6	67.7	68.3	69.4	69.7	70.1	71.7
100	38.7	39.1	39.1	40.3	41.1	41.8	42.4	43.0	43.8	44.4	45.2	45.9	46.7	47.4	47.6	48.3	48.3	48.0	48.3
105	31.5	32.0	32.0	33.0	33.8	34.5	35.1	35.6	36.0	36.4	36.9	37.2	37.4	37.6	37.5	37.7	37.4	36.9	36.6
110	31.1	31.6	31.8	32.7	33.4	34.0	34.5	35.1	35.5	35.9	36.1	36.4	36.5	36.6	36.5	36.5	36.0	35.4	34.7
115	28.6	29.1	29.5	30.2	30.8	31.4	32.1	32.8	33.3	33.8	34.2	34.6	34.7	35.0	35.2	34.9	34.3	33.6	32.9
120	25.1	25.7	26.0	26.8	27.3	27.9	28.6	29.4	29.9	30.5	30.9	31.1	31.2	31.5	31.8	31.5	30.9	30.1	29.4
125	21.1	21.6	21.9	22.7	23.1	23.7	24.5	25.2	25.9	26.4	26.8	27.1	27.1	27.4	27.6	27.4	26.8	26.1	25.3
130	16.8	17.2	17.2	18.0	18.4	18.9	19.6	20.3	21.0	21.6	21.9	22.2	22.2	22.4	22.6	22.4	22.0	21.2	20.7
135	12.2	12.6	12.4	13.1	13.4	13.8	14.4	15.0	15.6	16.1	16.4	16.7	16.5	16.7	17.0	16.8	16.4	16.0	15.7
140	8.56	8.91	8.67	9.21	9.27	9.46	9.93	10.4	10.7	11.1	11.3	11.5	11.3	11.4	11.7	11.6	11.4	11.2	11.0
145	6.17	6.50	6.20	6.68	6.68	6.90	7.26	7.61	7.85	8.06	8.24	8.38	8.12	8.25	8.63	8.60	8.48	8.29	8.25
150	4.48	4.75	4.38	4.88	4.89	5.08	5.33	5.56	5.79	5.99	6.05	6.06	5.81	5.89	6.35	6.34	6.01	6.15	6.22
155	3.39	3.69	3.30	3.71	3.72	3.83	4.04	4.26	4.39	4.51	4.54	4.52	4.27	4.26	4.77	4.66	4.32	4.56	4.51
160	2.51	3.01	2.65	3.00	3.12	3.18	3.35	3.55	3.59	3.65	3.58	3.67	3.32	3.18	3.77	3.66	3.52	3.69	3.89
165	2.07	2.58	2.08	2.44	2.57	2.66	2.83	2.98	3.08	3.15	3.00	3.10	2.68	1.86	2.82	3.04	2.99	3.11	3.33
170	1.83	2.06	1.94	1.84	1.92	2.26	2.47	2.56	2.62	2.59	2.48	2.39	1.81	1.64	2.16	2.64	2.57	2.65	2.66
175	1.46	1.43	1.42	1.61	1.53	1.61	1.78	1.85	1.92	1.89	1.64	1.32	1.16	0.83	0.90	1.47	1.64	2.00	2.14
180	0.79	0.79	0.78	0.78	0.79	0.78	0.77	0.77	0.77	0.77	0.77	0.77	0.72	0.75	0.76	0.77	0.77	0.76	0.79

Table 4: Luminous Intensity Data

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735		
5	734	735	734	735	735	734	734	734	733	732	732	732	731	732	731	729	730		
10	728	729	728	730	729	728	727	727	726	726	724	723	722	722	720	720	719		
15	717	720	717	718	717	716	717	714	713	712	711	710	709	707	706	703	704		
20	701	700	701	702	701	699	697	698	695	694	692	690	688	687	685	684	683		
25	679	680	679	680	678	677	676	674	672	670	668	666	665	663	661	657	658		
30	652	653	652	652	651	649	648	646	643	641	639	637	635	633	630	629	627		
35	620	621	619	620	619	616	614	612	610	607	605	602	599	598	596	592	592		
40	583	583	582	582	580	578	576	574	571	569	565	562	559	557	554	553	551		
45	539	540	538	539	538	535	532	530	527	524	521	518	515	513	510	507	506		
50	491	492	491	491	489	486	485	481	478	475	472	469	465	463	460	458	456		
55	439	439	439	439	438	435	432	429	426	423	420	416	413	410	407	404	403		
60	384	384	384	383	382	380	377	374	372	368	365	362	359	356	352	350	347		
65	327	328	327	327	326	324	322	319	316	313	310	307	303	300	297	294	292		
70	273	274	273	273	272	269	268	266	263	260	257	254	251	248	245	242	240		
75	222	223	223	223	221	220	218	216	213	211	208	205	202	200	197	195	193		
80	178	178	178	178	177	175	174	172	169	167	164	162	160	158	156	154	153		
85	139	139	139	138	137	136	134	132	130	128	126	124	122	120	118	117	116		
90	103	103	102	102	101	99.2	97.8	95.7	94.0	92.2	90.3	88.5	86.8	85.3	84.4	83.8	83.3		
95	71.3	71.0	70.3	69.8	68.7	67.5	66.4	65.0	63.5	62.0	60.5	59.3	58.0	57.1	56.6	56.2	56.4		
100	47.7	47.3	46.7	46.2	45.5	44.8	44.1	42.7	42.2	41.2	40.2	39.4	38.8	38.4	38.2	38.2	38.6		
105	35.7	35.0	34.4	34.0	33.4	32.7	32.3	31.6	31.6	31.3	31.1	31.0	31.0	31.0	31.1	31.3	31.3		
110	33.9	33.0	32.1	31.3	30.5	29.9	29.6	29.3	29.4	29.4	29.6	29.8	30.1	30.2	30.3	30.4	30.6		
115	31.8	30.8	29.8	28.9	28.0	27.2	26.9	26.9	26.8	26.7	26.8	26.9	27.1	27.3	27.6	27.8	28.1		
120	28.4	27.4	26.3	25.3	24.4	23.6	23.5	23.5	23.3	23.3	23.3	23.5	23.7	24.0	24.2	24.4	24.7		
125	24.3	23.4	22.3	21.3	20.4	19.8	19.7	19.7	19.6	19.5	19.6	19.9	20.1	20.3	20.5	20.7	20.8		
130	19.8	19.0	17.9	17.3	16.5	15.9	15.8	15.7	15.6	15.6	15.8	16.0	16.2	16.3	16.5	16.6	16.6		
135	15.0	14.4	13.6	13.0	12.5	11.9	11.8	11.9	11.8	11.8	11.8	12.0	12.1	12.1	12.1	12.2	12.1		
140	10.6	10.2	9.95	9.32	9.11	8.55	8.63	8.86	8.81	8.67	8.71	8.87	8.84	8.79	8.72	8.69	8.62		
145	8.06	7.75	7.59	7.25	7.04	6.60	6.94	7.00	6.97	6.79	6.77	6.88	6.84	6.77	6.65	6.56	6.47		
150	6.07	5.92	5.60	5.63	5.50	4.89	5.34	5.37	5.32	5.00	5.18	5.24	5.21	5.17	5.10	5.03	4.95		
155	4.48	4.50	4.23	4.34	4.27	3.58	4.05	3.89	3.97	3.65	3.84	4.05	4.06	4.06	4.04	3.98	3.93		
160	3.76	3.78	3.21	3.40	3.31	2.92	2.99	2.69	3.05	2.86	3.11	3.38	3.42	3.42	3.41	3.39	3.36		
165	3.30	3.19	3.08	3.07	2.65	2.51	1.81	2.05	2.13	2.40	2.56	2.83	2.98	2.98	2.96	2.96	2.70		
170	2.58	2.71	2.66	2.57	2.37	2.11	1.84	2.00	1.62	1.72	2.05	2.23	2.57	2.58	2.61	2.28	1.73		
175	2.14	2.09	1.86	1.87	1.66	1.34	1.35	1.11	1.07	1.02	1.11	1.29	1.24	1.14	1.27	1.35	1.25		
180	0.79	0.78	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.76	0.76	0.76		

Table 5: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 05, 2022	Aug. 04, 2023
Digital Power Meter	PF2010A	HZTE028-01	Aug. 05, 2022	Aug. 04, 2023
AC Power Supply	DPS1060	HZTE001-06	Aug. 05, 2022	Aug. 04, 2023
DC Power Supply	WY12010	HZTE004-03	Aug. 05, 2022	Aug. 04, 2023
Standard Source	D908	HZTE012-01	Aug. 05, 2022	Aug. 04, 2023
Standard source	SCL-1400	HZTE012-02	Aug. 05, 2022	Aug. 04, 2023
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 05, 2022	Aug. 04, 2023
Temperature recorder	JM624U	HZTE018-08	Aug. 05, 2022	Aug. 04, 2023

Table 6: Test Equipment List

TEST METHODS

Seasoning of SSL Product

For the purpose of rating new SSL products, SSL products shall be tested with no seasoning.
Therefore, no seasoning was performed.

Goniophotometer Method

Photometric and Electrical Measurements

An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.
Ambient temperature was measured at the same height of the sample mounted on the Goniophotometer equipment. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.
The stabilization time typically ranges from 30 min (small integrated LED lamps) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 20 min, taken 10 minutes apart, is less than 0.5 %.
Electrical measurements including voltage, current, and power were measured using the Everfine Digital Power Meter.
Some graphics were created with Photometric Plus software.
The standard reference of the Goniophotometer system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Metrology P.R. China.
The uncertainty of goniophotometer system reported in this document is expended uncertainty is 2.3% with a coverage factor k=2.

Color Characteristics Measurements

The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as values that are spatially average, weighted to intensity, over the angular range where light is intentionally emitted from the SSL product. The color characteristics measurements are using gonio-spectroradiometer.

*** End of Report ***