



LM-79-19 TEST REPORT

for

Beyond LED Technology

1939 Parker Court, Stone Mountain, GA 30087

LED Downlight

Model: FXF01187-A001

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.:HZ23100027f

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

Review by:

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April Zou

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Nov. 21, 2023

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Nov. 21, 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: **FXF01187-A001**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
118.5	3155.7	26.64	0.9955
CCT (K)	CRI	Stabilization Time (Light & Power)	
2756	82.4	50 mins	

Table 1: Executive Data Summary

Test specifications:

Date of Receipt : Oct. 20, 2023
Date of Test : Nov. 16, 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	: LED Downlight
Model	: FXF01187-A001
Electrical Ratings	: 120V,60Hz
Product Description	: Field-Adjustable 13W/19W/27W Color- Tunable 2700K/3000K/3500K/4000K/5000K
Manufacturer	: Beyond LED Technology
Address	: 1939 Parker Court, Stone Mountain, GA 30087

TEST RESULTS

Test ambient temperature was 24.6°C.

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

The stabilization time of the sample was 50 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	Special Rendering Indices	Color
Test Voltage (V)	120.0	R1	80
Voltage frequency (Hz)	60	R2	89
Test Current (A)	0.223	R3	97
Power Factor	0.9955	R4	80
Test Power (W)	26.64	R5	80
THD A%	7.87	R6	87
Luminous Efficacy (lm/W)	118.5	R7	84
Total Luminous Flux (lm)	3155.7	R8	61
Color Rendering Index (CRI)	82.4	R9	11
R9	11	R10	75
Correlated Color Temperature (CCT) (K)	2756	R11	79
Chromaticity (Chroma x, Chroma y)	(0.4590, 0.4162)	R12	68
Chromaticity (Chroma u, Chroma v)	(0.2594, 0.3529)	R13	82
Chromaticity (Chroma u', Chroma v')	(0.2594, 0.5293)	R14	98
Duv	0.0021		
Average Beam Angle (°)	98.7		
Center Beam Candle Power (cd)	1372		
Spacing Criteria	1.31 (0°-180°)/ 1.27(90°-270°)		
Zonal Lumens in the 0°-60°Zone	90.61%		
Zonal Lumens in the 60°-90°Zone	9.29%		
Zonal Lumens in the 90°-120°Zone	0.01%		
Zonal Lumens in the 120°-180°Zone	0.08%		

Table 2: Test data per Goniophotometer Method

Spectral Power Distribution- Goniophotometer Method

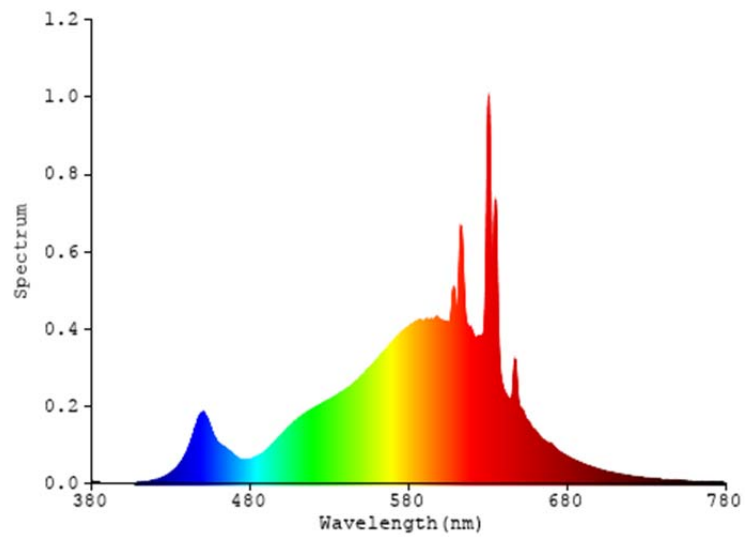


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	130.303	4.13%
10- 20	377.681	11.97%
20- 30	577.805	18.31%
30- 40	685.623	21.73%
40- 50	640.783	20.31%
50- 60	447.256	14.17%
60- 70	245.16	7.77%
70- 80	44.522	1.41%
80- 90	3.469	0.11%
90-100	0.062	0.00%
100-110	0.137	0.00%
110-120	0.248	0.01%
120-130	0.38	0.01%
130-140	0.545	0.02%
140-150	0.596	0.02%
150-160	0.538	0.02%
160-170	0.392	0.01%
170-180	0.148	0.00%
Total	3155.6	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	2859.45	90.61%
60- 90	293.151	9.29%
0-90	3152.6	99.90%
90- 180	3.046	0.10%
0- 180	3155.6	100%

Table 3: Zonal Lumen Data

Note: The Flux in this table might be a little different from the total flux in Table 2 due to rounding.

Illuminance Plots- Goniophotometer Method

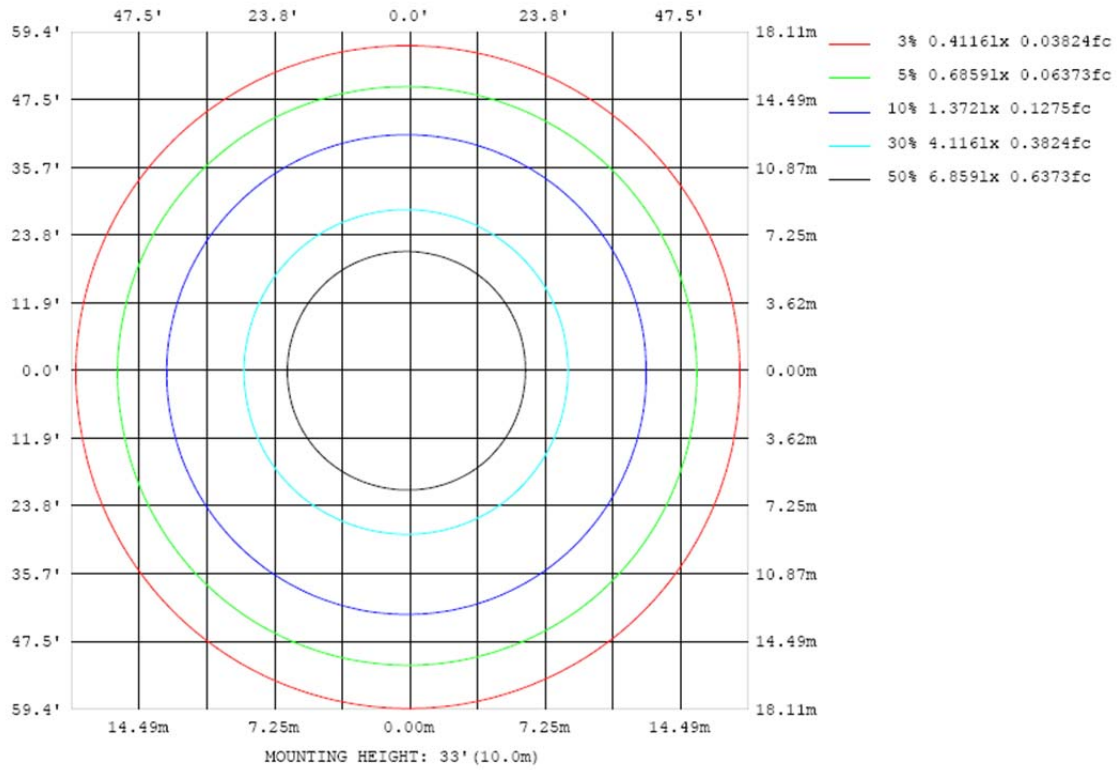


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

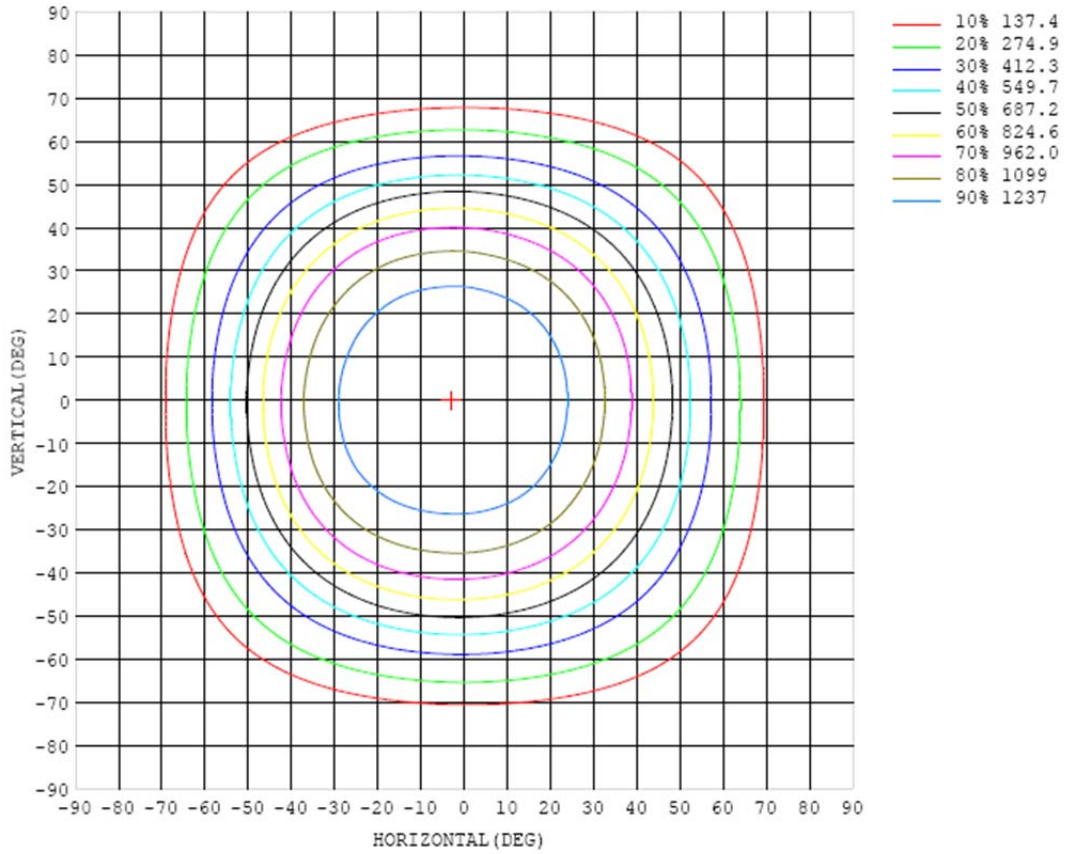


Chart 3: Isocandela Plot

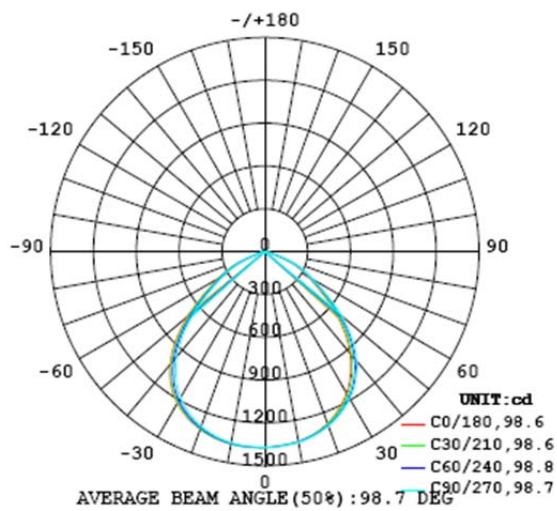


Chart 4: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1 UNIT: cd

C (DEG) \ γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372
5	1364	1366	1363	1364	1362	1364	1365	1366	1366	1366	1368	1367	1370	1370	1370	1370	1372	1374	1373
10	1351	1351	1351	1351	1351	1351	1352	1353	1354	1355	1358	1359	1361	1362	1363	1365	1366	1367	1367
15	1324	1326	1326	1327	1326	1329	1330	1330	1333	1335	1336	1339	1342	1344	1347	1349	1351	1352	1353
20	1282	1283	1284	1287	1289	1292	1295	1296	1298	1299	1303	1307	1312	1316	1321	1323	1324	1325	1324
25	1222	1226	1228	1232	1236	1242	1245	1247	1248	1252	1256	1261	1268	1275	1280	1283	1285	1285	1285
30	1146	1149	1153	1159	1166	1174	1180	1183	1187	1189	1195	1201	1209	1217	1225	1228	1229	1227	1224
35	1049	1053	1058	1067	1075	1086	1093	1099	1103	1106	1113	1120	1130	1140	1147	1149	1149	1146	1145
40	931	934	940	949	960	972	982	988	995	1000	1006	1014	1023	1032	1037	1038	1037	1032	1029
45	788	793	799	809	819	831	841	849	857	863	870	876	883	889	892	890	888	882	880
50	630	635	642	651	660	669	678	687	694	700	705	709	713	715	715	713	708	704	701
55	472	478	484	492	500	508	514	519	524	527	530	532	534	534	533	530	526	519	518
60	353	358	362	368	373	378	381	383	385	386	388	389	389	389	386	382	378	374	372
65	253	258	263	269	273	277	280	282	283	283	283	282	281	279	275	271	267	262	261
70	120	129	136	143	148	153	155	157	157	156	154	151	147	142	136	131	124	116	114
75	33.4	35.9	38.4	39.9	41.0	43.3	43.5	43.6	43.5	42.8	40.5	39.6	38.4	37.2	35.7	34.3	33.2	32.4	32.3
80	10.6	11.4	12.1	12.6	12.9	13.0	12.9	12.8	12.7	12.6	12.4	12.2	12.0	11.7	11.4	11.1	10.8	10.6	10.6
85	2.32	2.60	2.85	3.04	3.18	3.25	3.28	3.31	3.31	3.29	3.25	3.17	3.07	2.95	2.83	2.70	2.58	2.42	2.39
90	0.02	0.03	0.03	0.03	0.04	0.06	0.06	0.06	0.07	0.06	0.06	0.05	0.04	0.04	0.03	0.03	0.03	0.02	0.04
95	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.07
100	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.11
105	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.16
110	0.13	0.13	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.22
115	0.19	0.19	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.30
120	0.27	0.27	0.27	0.26	0.26	0.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.26	0.26	0.38
125	0.38	0.37	0.37	0.36	0.36	0.36	0.35	0.35	0.35	0.34	0.34	0.34	0.34	0.34	0.35	0.35	0.35	0.35	0.46
130	0.49	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.47	0.58
135	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.65	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.65	0.75
140	0.75	0.74	0.74	0.73	0.73	0.73	0.72	0.72	0.71	0.71	0.71	0.70	0.70	0.70	0.70	0.70	0.71	0.71	0.92
145	0.83	0.83	0.82	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	1.08
150	0.93	0.92	0.92	0.92	0.91	0.91	0.90	0.90	0.90	0.89	0.89	0.89	0.88	0.88	0.88	0.88	0.88	0.89	1.20
155	1.06	1.06	1.05	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.27
160	1.15	1.15	1.15	1.14	1.14	1.14	1.13	1.13	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.43
165	1.19	1.19	1.19	1.19	1.19	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.18	1.18	1.18	1.18	1.59
170	1.29	1.29	1.29	1.29	1.28	1.28	1.28	1.28	1.28	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.28	1.28	1.67
175	1.48	1.48	1.47	1.47	1.47	1.47	1.47	1.47	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.74
180	1.76	1.76	1.75	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.75	1.75	1.75	1.75	1.76	1.76	1.74

Table 4: Luminous Intensity Data

Table--2 UNIT: cd

C (DEG) \ γ (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372		
5	1375	1373	1373	1371	1372	1372	1371	1370	1369	1369	1366	1367	1366	1365	1363	1364	1365		
10	1368	1367	1366	1366	1365	1364	1362	1361	1359	1358	1356	1355	1354	1353	1352	1353	1353		
15	1353	1351	1351	1347	1347	1345	1341	1340	1338	1335	1332	1332	1331	1329	1327	1326	1325		
20	1324	1322	1321	1318	1316	1314	1310	1307	1303	1301	1297	1295	1293	1289	1286	1284	1284		
25	1283	1279	1279	1275	1272	1269	1263	1258	1252	1248	1243	1241	1238	1235	1231	1228	1226		
30	1223	1220	1218	1214	1210	1205	1196	1188	1182	1177	1171	1168	1166	1162	1156	1152	1149		
35	1141	1136	1134	1128	1123	1116	1105	1096	1087	1080	1074	1070	1068	1065	1060	1056	1054		
40	1025	1020	1016	1009	1002	993	982	970	960	953	947	944	942	941	936	935	933		
45	875	868	862	853	844	834	823	812	804	797	792	790	790	790	789	789	791		
50	695	687	679	669	660	651	641	633	625	621	617	618	619	621	623	626	629		
55	513	506	499	492	484	477	468	461	457	454	453	456	459	463	466	469	472		
60	369	365	361	356	351	345	339	335	332	331	332	334	339	343	346	349	353		
65	256	251	245	239	232	226	221	218	217	218	219	224	229	235	240	245	251		
70	108	103	96.4	89.6	84.0	79.7	77.3	75.9	75.6	76.6	78.8	82.4	87.1	93.2	101	108	117		
75	31.4	30.0	28.3	26.5	24.9	23.5	22.6	22.3	22.4	22.8	23.3	24.0	24.7	25.9	27.3	29.3	31.6		
80	10.3	9.79	9.14	8.46	7.86	7.42	7.20	7.07	7.10	7.23	7.39	7.57	7.81	8.13	8.56	9.25	9.97		
85	2.21	2.01	1.77	1.56	1.38	1.24	1.16	1.13	1.14	1.17	1.22	1.30	1.40	1.52	1.68	1.90	2.16		
90	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		
95	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07		
100	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12		
105	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.17		
110	0.23	0.23	0.23	0.24	0.24	0.24	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.24		
115	0.30	0.31	0.31	0.32	0.32	0.32	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33		
120	0.38	0.39	0.39	0.39	0.40	0.40	0.41	0.41	0.41	0.41	0.42	0.42	0.42	0.42	0.41	0.41	0.41		
125	0.46	0.47	0.47	0.48	0.48	0.49	0.49	0.49	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50		
130	0.59	0.59	0.59	0.60	0.61	0.61	0.61	0.62	0.62	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.62		
135	0.76	0.76	0.76	0.77	0.77	0.78	0.78	0.79	0.79	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80		
140	0.92	0.93	0.93	0.94	0.94	0.95	0.95	0.96	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97		
145	1.08	1.09	1.09	1.09	1.09	1.10	1.10	1.11	1.12	1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.13		
150	1.20	1.20	1.21	1.21	1.21	1.21	1.22	1.23	1.23	1.24	1.24	1.24	1.25	1.25	1.25	1.25	1.25		
155	1.28	1.28	1.28	1.28	1.28	1.29	1.29	1.29	1.30	1.31	1.31	1.31	1.32	1.32	1.32	1.32	1.33		
160	1.43	1.44	1.44	1.44	1.44	1.44	1.44	1.45	1.45	1.46	1.46	1.46	1.47	1.47	1.47	1.47	1.48		
165	1.60	1.59	1.59	1.59	1.59	1.59	1.60	1.60	1.60	1.60	1.60	1.61	1.61	1.61	1.61	1.62	1.62		
170	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.68	1.68	1.68	1.68	1.68		
175	1.74	1.74	1.74	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.74		
180	1.74	1.74	1.74	1.74	1.74	1.74	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73		

Table 5: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jun. 05, 2023	-
Digital Power Meter	PF2010A	HZTE028-01	Aug. 01, 2023	Jul. 31, 2024
AC Power Supply	DPS1060	HZTE001-06	Aug. 01, 2023	Jul. 31, 2024
DC Power Supply	WY12010	HZTE004-03	Aug. 01, 2023	Jul. 31, 2024
Standard Source	D908	HZTE012-01	Aug. 14, 2018	-
Standard source	SCL-1400	HZTE012-06	Nov. 04, 2021	-
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 04, 2023	Aug. 03, 2024
Temperature recorder	JM624U	HZTE018-08	Aug. 04, 2023	Aug. 03, 2024

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 expanded 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 *****

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