



LM-79-19 TEST REPORT

for

Beyond LED Technology

1939 Parker Court, Stone Mountain, GA 30087

LED Downlight

Model: FXF01188-A001

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.:HZ23100027g

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. 09, 2023

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Nov. 09, 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: **FXF01188-A001**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
114.5	4056.6	35.44	0.9955
CCT (K)	CRI	Stabilization Time (Light & Power)	
2718	82.4	50 mins	

Table 1: Executive Data Summary

Test specifications:

Date of Receipt : Oct. 20, 2023
Date of Test : Oct. 24, 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	: FXF01188-A001
Electrical Ratings	: 120V,60Hz
Product Description	: Field-Adjustable 18W/27W/36W 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	81
Voltage frequency (Hz)	60	R2	92
Test Current (A)	0.296	R3	96
Power Factor	0.9955	R4	80
Test Power (W)	35.44	R5	81
THD A%	7.59	R6	91
Luminous Efficacy (lm/W)	114.5	R7	82
Total Luminous Flux (lm)	4056.6	R8	56
Color Rendering Index (CRI)	82.4	R9	5
R9	5	R10	81
Correlated Color Temperature (CCT) (K)	2718	R11	80
Chromaticity (Chroma x, Chroma y)	(0.4626, 0.4179)	R12	75
Chromaticity (Chroma u, Chroma v)	(0.2610, 0.3537)	R13	83
Chromaticity (Chroma u', Chroma v')	(0.2610, 0.5305)	R14	98
Duv	0.0024		
Average Beam Angle (°)	97.0		
Center Beam Candle Power (cd)	1830		
Spacing Criteria	1.37 (0°-180°)/ 1.38(90°-270°)		
Zonal Lumens in the 0°-60°Zone	96.86%		
Zonal Lumens in the 60°-90°Zone	3.05%		
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

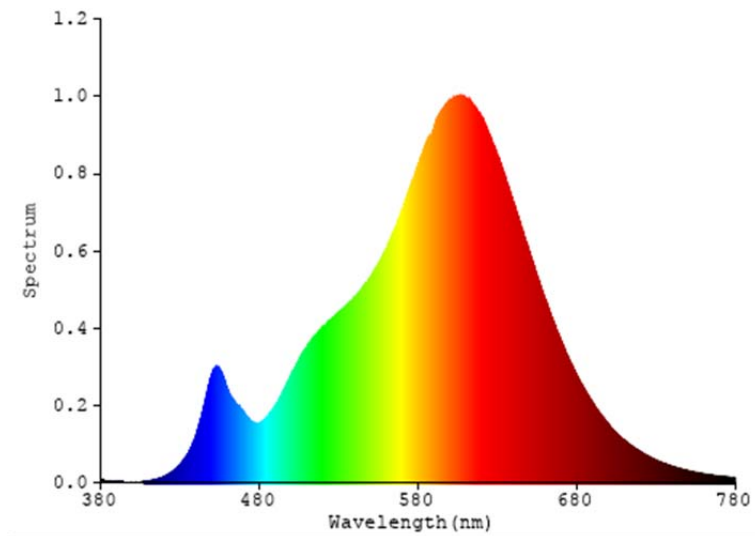


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	175.022	4.31%
10- 20	524.587	12.93%
20- 30	854.294	21.06%
30- 40	1036.715	25.56%
40- 50	880.185	21.70%
50- 60	458.257	11.30%
60- 70	116.374	2.87%
70- 80	6.845	0.17%
80- 90	0.685	0.02%
90-100	0.051	0.00%
100-110	0.121	0.00%
110-120	0.238	0.01%
120-130	0.41	0.01%
130-140	0.63	0.02%
140-150	0.759	0.02%
150-160	0.718	0.02%
160-170	0.496	0.01%
170-180	0.186	0.00%
Total	4056.6	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3929.06	96.86%
60- 90	123.904	3.05%
0-90	4052.96	99.91%
90- 180	3.609	0.09%
0- 180	4056.6	100%

Table 3: Zonal Lumen Data

Illuminance Plots- Goniophotometer Method

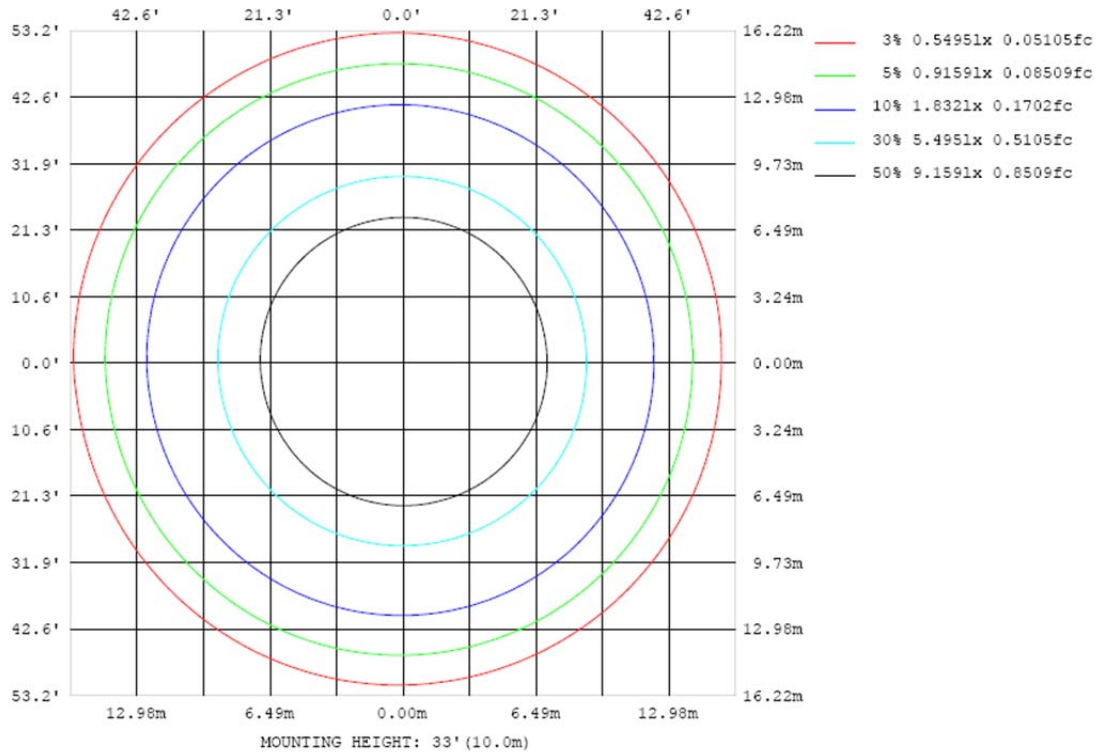


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

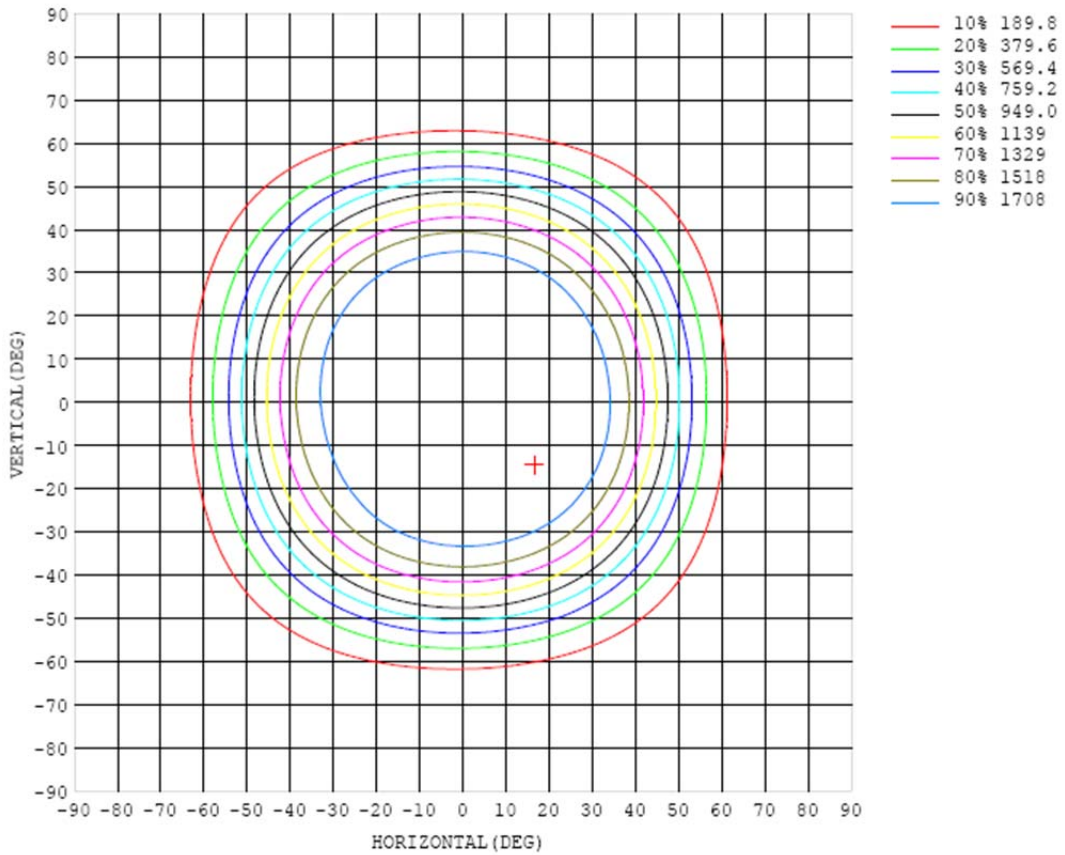


Chart 3: Isocandela Plot

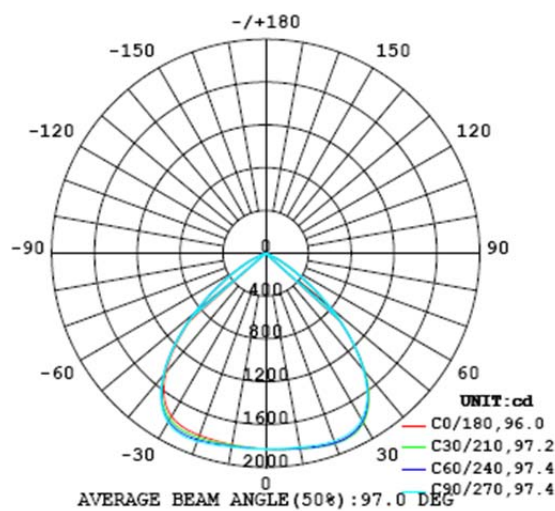


Chart 4: Polar Candela Distribution

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	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830
5	1840	1843	1840	1838	1841	1839	1835	1837	1833	1832	1830	1832	1827	1828	1823	1823	1821	1824	1823
10	1850	1853	1853	1853	1856	1853	1850	1850	1845	1839	1838	1834	1830	1827	1820	1819	1818	1816	1816
15	1866	1873	1875	1876	1879	1875	1871	1869	1861	1856	1850	1845	1838	1830	1822	1817	1813	1813	1813
20	1884	1889	1892	1893	1898	1892	1886	1882	1872	1865	1861	1857	1846	1837	1824	1815	1811	1810	1811
25	1876	1883	1887	1888	1889	1885	1876	1871	1862	1856	1851	1844	1836	1827	1814	1806	1800	1801	1803
30	1820	1826	1826	1825	1826	1818	1810	1806	1797	1792	1790	1789	1781	1773	1764	1757	1754	1757	1760
35	1676	1680	1680	1677	1677	1670	1663	1659	1653	1650	1653	1652	1651	1648	1643	1640	1643	1646	1651
40	1435	1439	1439	1437	1436	1431	1425	1424	1420	1421	1424	1429	1429	1432	1429	1431	1434	1443	1450
45	1120	1122	1120	1119	1122	1120	1117	1119	1119	1121	1125	1130	1133	1135	1137	1139	1146	1153	1167
50	772	773	772	773	776	780	781	788	790	793	797	800	802	804	807	811	818	828	839
55	455	455	456	457	461	464	468	473	477	481	486	492	495	497	499	503	508	515	529
60	232	231	231	231	234	236	240	244	248	253	258	263	268	271	275	278	281	285	294
65	78.0	77.2	76.4	77.4	79.5	82.3	85.9	89.6	93.0	96.8	101	106	110	114	118	122	125	127	134
70	11.4	11.3	11.3	11.6	12.0	12.7	13.4	14.1	14.7	15.2	15.8	16.4	17.1	18.1	19.2	20.4	21.5	22.7	24.6
75	3.85	3.81	3.84	3.93	4.10	4.30	4.50	4.68	4.79	4.86	4.94	5.00	5.04	5.13	5.41	5.47	5.56	5.66	5.68
80	1.33	1.32	1.34	1.39	1.46	1.54	1.63	1.70	1.74	1.76	1.78	1.79	1.79	1.81	1.85	1.88	1.91	1.94	2.01
85	0.33	0.32	0.33	0.34	0.35	0.36	0.38	0.40	0.42	0.43	0.45	0.46	0.48	0.49	0.51	0.53	0.55	0.57	0.60
90	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.05
95	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	0.03	0.05
100	0.05	0.05	0.05	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	0.05	0.08
105	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	0.07	0.07	0.07	0.07	0.14
110	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.21
115	0.18	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.29
120	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.27	0.27	0.27	0.38
125	0.42	0.42	0.42	0.42	0.43	0.43	0.43	0.43	0.43	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.41	0.40	0.49
130	0.57	0.57	0.58	0.58	0.58	0.58	0.58	0.59	0.58	0.58	0.57	0.58	0.57	0.57	0.57	0.56	0.56	0.56	0.65
135	0.76	0.77	0.77	0.77	0.77	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.77	0.76	0.76	0.76	0.76	0.75	0.89
140	0.93	0.94	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.94	0.94	0.94	0.94	0.93	0.93	0.93	0.92	1.13
145	1.09	1.09	1.09	1.09	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.09	1.09	1.09	1.09	1.08	1.36
150	1.26	1.26	1.26	1.26	1.26	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.26	1.26	1.26	1.26	1.26	1.56
155	1.45	1.45	1.45	1.45	1.45	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.70
160	1.60	1.60	1.59	1.59	1.60	1.60	1.59	1.60	1.60	1.59	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.82
165	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.88
170	1.77	1.77	1.77	1.77	1.77	1.77	1.76	1.77	1.77	1.77	1.77	1.78	1.77	1.78	1.77	1.78	1.78	1.78	1.95
175	2.02	2.02	2.01	2.01	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.03	2.02	2.03	2.03	2.03	2.03	2.03	2.04
180	2.09	2.09	2.08	2.09	2.09	2.08	2.08	2.09	2.09	2.09	2.09	2.07	2.09	2.08	2.09	2.09	2.09	2.09	2.08

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	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830	1830		
5	1826	1825	1822	1828	1826	1827	1831	1831	1830	1833	1836	1834	1837	1835	1836	1837	1840		
10	1821	1820	1822	1828	1828	1831	1835	1834	1838	1841	1844	1844	1845	1846	1845	1847	1849		
15	1818	1821	1827	1834	1839	1843	1848	1852	1854	1860	1864	1864	1863	1862	1862	1861	1865		
20	1822	1826	1834	1846	1849	1855	1861	1867	1869	1876	1883	1882	1882	1877	1873	1874	1878		
25	1811	1819	1831	1844	1849	1856	1861	1866	1872	1879	1883	1883	1881	1877	1873	1872	1874		
30	1771	1782	1791	1803	1808	1813	1820	1822	1824	1831	1834	1831	1830	1822	1818	1817	1818		
35	1665	1672	1681	1691	1694	1696	1701	1702	1701	1705	1704	1698	1694	1688	1681	1679	1677		
40	1462	1470	1478	1484	1487	1486	1487	1485	1482	1482	1479	1473	1465	1454	1447	1443	1439		
45	1177	1188	1194	1200	1201	1200	1200	1196	1193	1188	1181	1171	1162	1149	1139	1131	1127		
50	848	856	862	869	872	873	874	870	864	857	846	833	820	806	795	788	782		
55	535	541	546	551	553	553	552	548	542	534	524	512	501	488	478	470	465		
60	298	302	305	307	306	304	302	297	292	286	279	271	263	255	249	243	239		
65	136	137	138	138	137	135	132	128	123	118	112	106	101	95.6	91.1	87.1	84.1		
70	25.3	25.6	25.7	25.5	25.3	24.3	25.3	23.5	22.0	20.5	20.0	18.6	17.7	16.4	14.9	13.9	13.6		
75	5.75	5.84	5.95	6.08	6.18	6.18	6.11	5.95	5.79	5.65	5.46	5.23	4.98	4.71	4.46	4.25	4.06		
80	2.04	2.08	2.14	2.20	2.25	2.27	2.25	2.19	2.13	2.04	1.93	1.82	1.72	1.62	1.54	1.46	1.40		
85	0.63	0.65	0.67	0.69	0.71	0.70	0.69	0.66	0.62	0.57	0.53	0.49	0.45	0.42	0.39	0.36	0.35		
90	0.05	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.04	0.03	0.03	0.03	0.03		
95	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.06	0.06		
100	0.08	0.08	0.07	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10		
105	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16		
110	0.21	0.21	0.21	0.21	0.21	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.23	0.23	0.23		
115	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.30	0.29	0.30	0.30	0.30	0.30		
120	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.39	0.39	0.39		
125	0.49	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.49	0.49	0.49		
130	0.66	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65		
135	0.89	0.89	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.88		
140	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.10	1.10	1.11	1.11		
145	1.36	1.35	1.35	1.35	1.35	1.34	1.35	1.34	1.34	1.34	1.33	1.33	1.33	1.33	1.33	1.33	1.33		
150	1.55	1.55	1.54	1.54	1.54	1.54	1.54	1.53	1.53	1.53	1.52	1.52	1.52	1.52	1.52	1.52	1.52		
155	1.70	1.70	1.69	1.69	1.69	1.68	1.68	1.67	1.67	1.67	1.66	1.66	1.66	1.66	1.66	1.67	1.67		
160	1.81	1.81	1.80	1.80	1.79	1.79	1.79	1.79	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78		
165	1.88	1.88	1.87	1.87	1.86	1.86	1.86	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85		
170	1.95	1.95	1.94	1.94	1.94	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.94		
175	2.04	2.04	2.04	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.04		
180	2.08	2.08	2.08	2.08	2.07	2.07	2.08	2.08	2.07	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.09		

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 ***

This report is considered invalidated without the Special Seal for Inspection of the LTL. This report shall not be altered, increased or deleted. The results shown in this test report refer only to the sample(s) tested. Without written approval of LTL, this test report shall not be copied except in full and published as advertisement.