Photometric Test Report

Relevant Standards

☑ IES LM-79-2008
☑ ANSI C82.77-2017

Prepared For

RAB Lighting Inc.

Prepared By
Dongguan New Testing Centre Co., Ltd.

Prepare by:

Engineer: Alan Wang
Date: 2020-12-19

Review by:

Technical Lead: Vincent Yuan
Issue Date: 2020-12-19
Revised Date: N/A

Laboratory: Dongguan New Testing Centre Co., Ltd
Address: 3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Tel: 86-769-22212079
Website: http://www.ntc-cert.com

1.0 Test Summary

DLC Technical Requirements V5.1

Outdoor – Pole/Arm-Mounted Area and Roadway Luminaires				
Requirement Category	**Test Method**	**Requirements**		**Test Value**
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	1000		17403.1
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	Standard	Premium	123.08
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		141.4
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	5.78
		20.00%	277V	9.72
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.9946
		0.9	277V	0.9215
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	4969
		4 steps	5029±220	4969
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		73.2
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥-40		-26
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		74
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		95
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-17%
Zonal Lumen Requirement (0°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	100%		100%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	⩽10%		2.5%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		120.0
(Goniophotometer – Section 4.2)		Non-Worst Case		277.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		1.182
(Goniophotometer – Section 4.2)		Non-Worst Case		0.5362
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		141.4
(Goniophotometer – Section 4.2)		Non-Worst Case		136.9

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2020-12-17	ALED5S150/D10	201214003-S1
2	Goniophotometer Test	2020-12-17	ALED5S150/D10	201214003-S1
3	THD and PF Test	2020-12-17	ALED5S150/D10	201214003-S1

Remark (If any)

1. **The results contained in this report pertain only to the tested samples.**
2. **This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.**
3. **This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.**

3.0 Product Description

Luminaire Description: Outdoor Area and Road Luminaires, Model No. ALED5S150/D10, 5000K

Electrical Specification: 120-277Vac, 50/60Hz

Photos of Luminaire Characteristics

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	ALED5S150/D10	Sample ID	201214003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

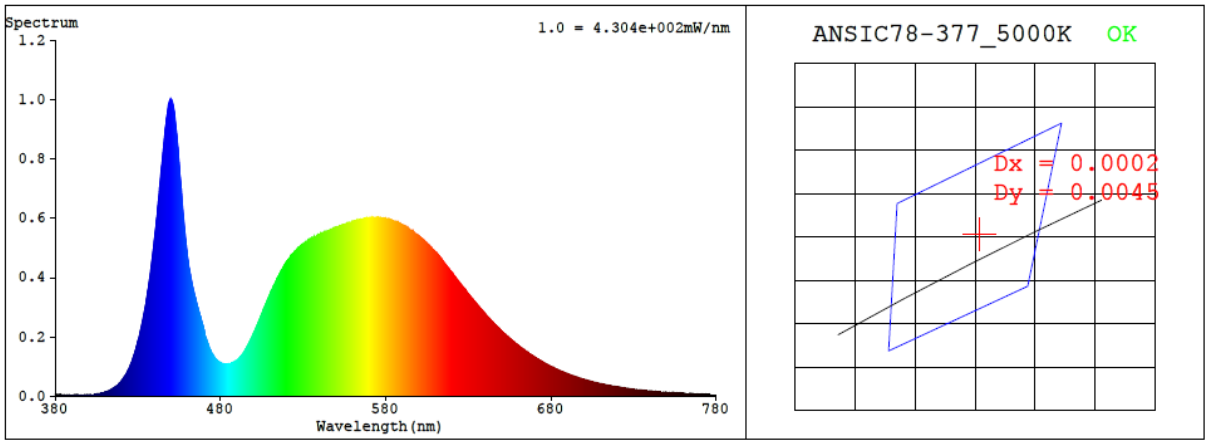
Test Method
The Samples were tested according to the IES LM-79-2008. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load. The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	1.182	141.4	0.9946
277.0	60	0.5362	136.9	0.9215

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4969	73.2	-26	0.0021	74	95	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: x = 0.3462 y = 0.3568 / u' = 0.2102 v' = 0.4873 (duv=2.13e-03)

CCT= 4969K Prcp WL: Ld=571.0nm Purity=10.9%

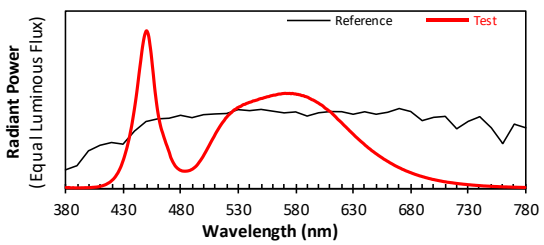
Peak WL: Lp=450nm FWHM: =20.1nm Ratio:R=14.5% G=82.4% B=3.2%

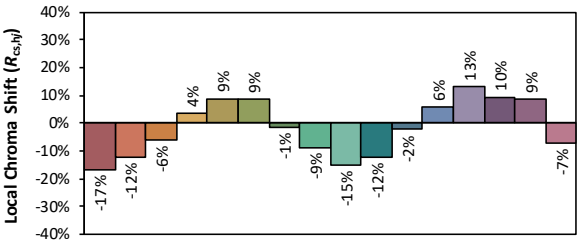
Render Index: Ra = 73.2 AvgR = 62.9

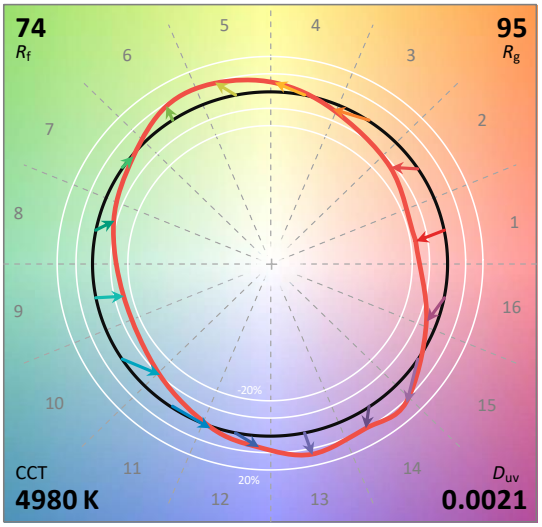
EEI: 0.12615 A+

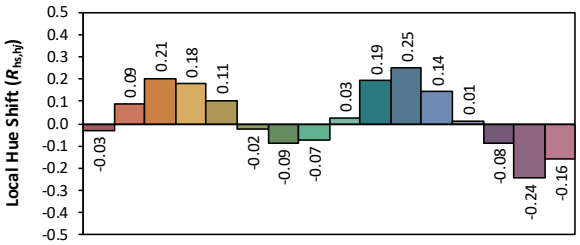
R1 =71	R2 =78	R3 =83	R4 =73	R5 =71	R6 =69	R7 =83	
R8 =58	R9 =-26	R10=48	R11=69	R12=40	R13=72	R14=91	R15=65

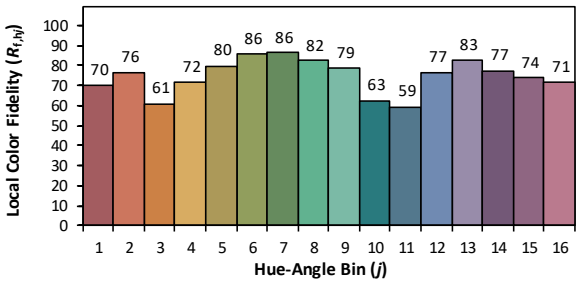
4.1 Integrating Sphere Test

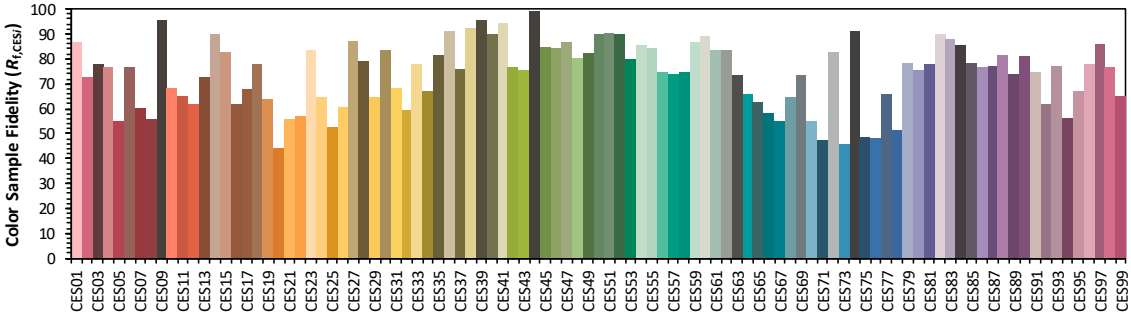












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3461
y	0.3565
u'	0.2102
v'	0.4872

CIE 13.3-1995 (CRI)

R_a	73
R_9	-26

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	ALED5S150/D10	Sample ID	201214003-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.1	Humidity (%RH)	46.5

Test Method
The Samples were tested according to the IES LM-79-2008. Photometric parameters were measured using a type C goniophotometer and software. The ambient temperature shall be maintained at 25±1°C, measured at a point not more than 1 m from the sample and at the same height as the sample. The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1.0° vertical intervals and 15° horizontal intervals.

Test Conditions

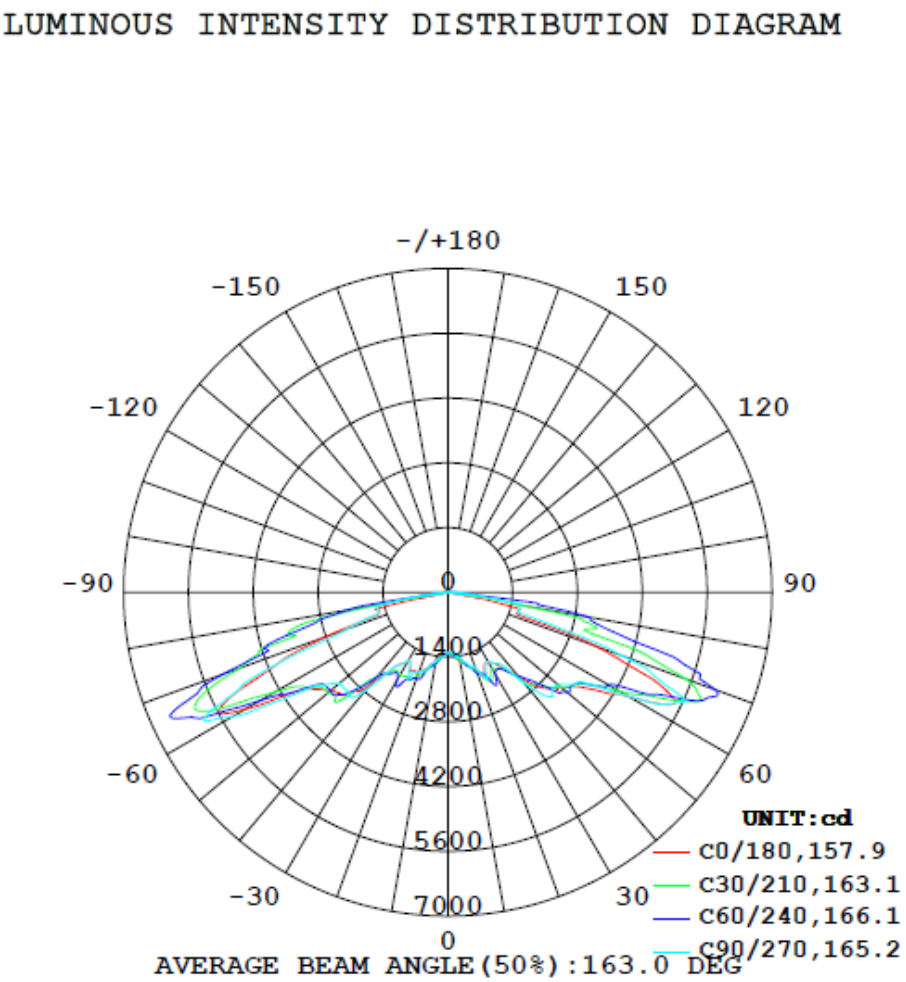
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	1.182	141.4	0.9946
NON-WORST CASE	277.0	60	0.5362	136.9	0.9215

Test Result

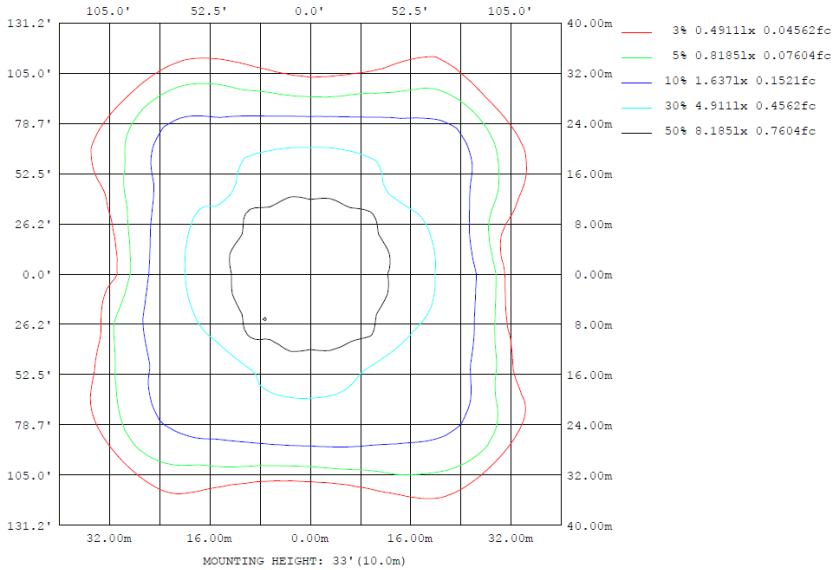
Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement		BUG Rating
		C0-180	C90-270	C0-180	C90-270		(0°-90°)	(80°-90°)	
0°-180° zones	17403.1	146.3	163.8	108.3	143.9	123.08	100%	2.5%	B4-U0-G3

4.2 Goniophotometer Test

Lighting Distribution Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

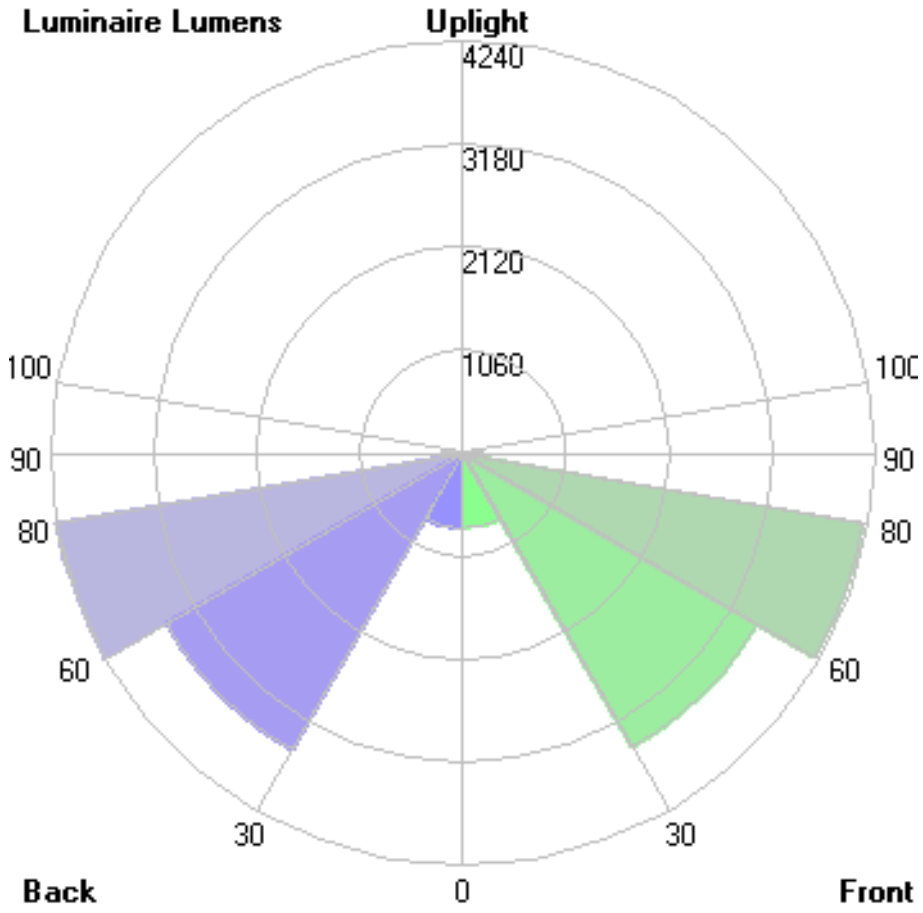
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	1511	1509	1442	1466	1530	1547	1528	1577	0- 10	135.9	135.9	0.78,0.78
20	1771	1837	1717	1809	1863	1909	1849	1963	10- 20	482.1	618.0	3.55,3.55
30	1748	2489	1735	2418	1726	2222	1708	2348	20- 30	917.8	1536	8.82,8.82
40	2385	2001	2534	1951	2618	1951	2768	1973	30- 40	1320	2856	16.4,16.4
50	3212	3317	3113	3409	3295	3552	3071	3624	40- 50	2291	5147	29.6,29.6
60	4506	4130	4467	4206	5050	4206	5378	4124	50- 60	3401	8548	49.1,49.1
70	3393	7082	3978	7374	2749	7931	2323	7914	60- 70	5159	13706	78.8,78.8
80	594.4	2135	1558	2064	35.53	2121	1221	1715	70- 80	3266	16972	97.5,97.5
90	0	0	0	0	0	0	0	0	80- 90	431.1	17403	100,100
100	0	0	0	0	0	0	0	0	90-100	0	17403	100,100
110	0	0	0	0	0	0	0	0	100-110	0	17403	100,100
120	0	0	0	0	0	0	0	0	110-120	0	17403	100,100
130	0	0	0	0	0	0	0	0	120-130	0	17403	100,100
140	0	0	0	0	0	0	0	0	130-140	0	17403	100,100
150	0	0	0	0	0	0	0	0	140-150	0	17403	100,100
160	0	0	0	0	0	0	0	0	150-160	0	17403	100,100
170	0	0	0	0	0	0	0	0	160-170	0	17403	100,100
180	0	0	0	0	0	0	0	0	170-180	0	17403	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	135.88	0-10	135.88	0.78%
10-20	482.11	0-20	617.99	3.55%
20-30	917.82	0-30	1535.81	8.82%
30-40	1320.31	0-40	2856.12	16.41%
40-50	2290.96	0-50	5147.08	29.58%
50-60	3400.60	0-60	8547.68	49.12%
60-70	5158.79	0-70	13706.47	78.76%
70-80	3265.57	0-80	16972.04	97.52%
80-90	431.06	0-90	17403.10	100.00%
90-100	0.00	0-100	17403.10	100.00%
100-110	0.00	0-110	17403.10	100.00%
110-120	0.00	0-120	17403.10	100.00%
120-130	0.00	0-130	17403.10	100.00%
130-140	0.00	0-140	17403.10	100.00%
140-150	0.00	0-150	17403.10	100.00%
150-160	0.00	0-160	17403.10	100.00%
160-170	0.00	0-170	17403.10	100.00%
170-180	0.00	0-180	17403.10	100.00%

4.2 Goniophotometer Test

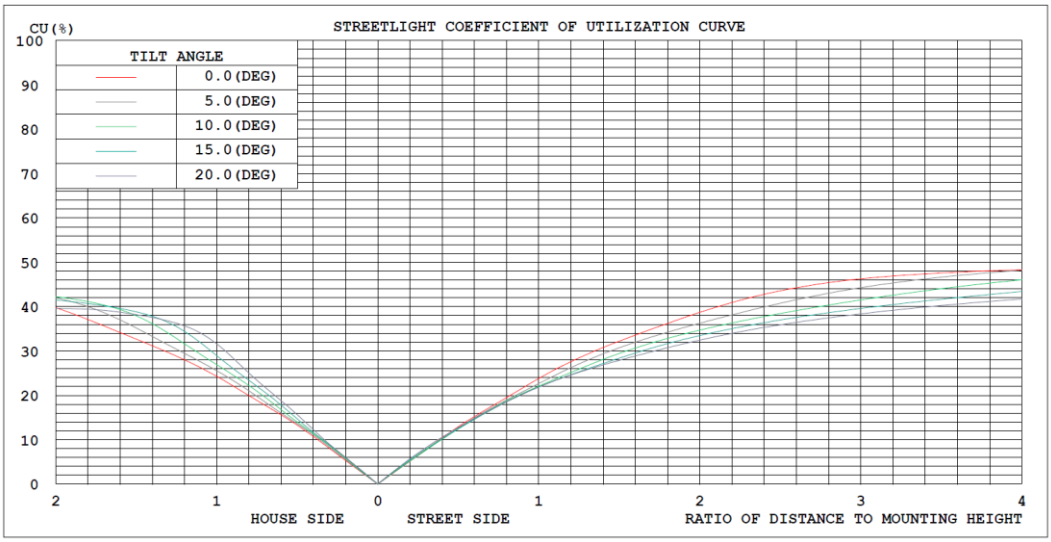
LCS/UBG



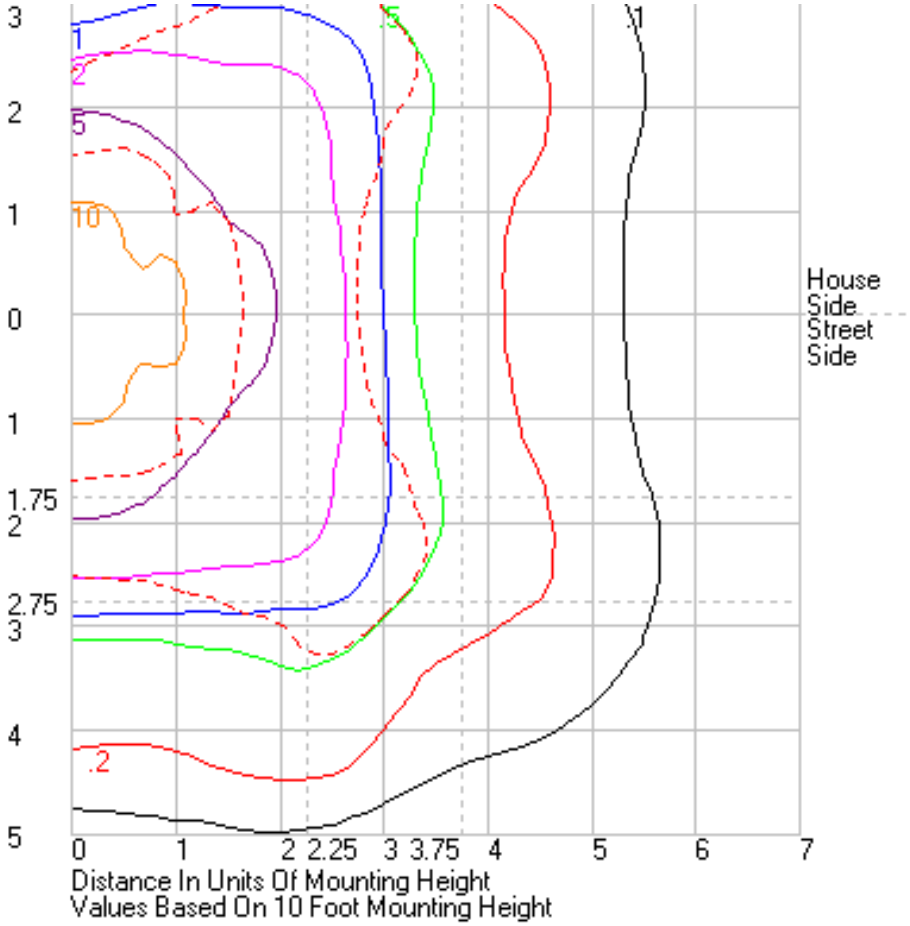
LCS Zone		Lumens	%Lamp	%Lum
FL	(0-30)	767.4	N.A.	4.4
FM	(30-60)	3496.6	N.A.	20.1
FH	(60-80)	4183.9	N.A.	24.0
FVH	(80-90)	201.3	N.A.	1.2
BL	(0-30)	768.4	N.A.	4.4
BM	(30-60)	3515.3	N.A.	20.2
BH	(60-80)	4240.4	N.A.	24.4
BVH	(80-90)	229.8	N.A.	1.3
UL	(90-100)	0.0	N.A.	0.0
UH	(100-180)	0.0	N.A.	0.0
Total		17403.1	N.A.	100.0
BUG Rating		**B4-U0-G3**		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	1309	1308	1308	1307	1307	1307	1307	1305	1305	1305	1310	1316	1320	1320	1318	1316	1315	1314	1314
5	1365	1357	1353	1353	1362	1372	1382	1383	1382	1383	1391	1399	1404	1394	1380	1365	1355	1347	1341
10	1511	1525	1532	1531	1516	1498	1484	1492	1503	1509	1484	1457	1434	1445	1462	1478	1470	1456	1442
15	1658	1678	1688	1689	1673	1654	1640	1655	1674	1689	1682	1668	1647	1618	1591	1568	1566	1570	1576
20	1771	1754	1747	1750	1769	1793	1817	1826	1831	1837	1859	1877	1881	1839	1787	1738	1722	1716	1717
25	1869	1876	1897	1933	2005	2075	2126	2097	2050	2002	1995	2002	2024	2078	2129	2163	2117	2059	2009
30	1748	1750	1764	1789	1809	1852	1930	2140	2344	2489	2390	2225	2043	1961	1901	1855	1800	1759	1735
35	1948	1952	1957	1964	1973	1983	1994	2008	2021	2031	2034	2033	2027	2017	2002	1981	1940	1901	1877
40	2385	2380	2387	2406	2476	2529	2537	2355	2157	2001	2079	2214	2363	2412	2440	2458	2488	2514	2534
45	2919	2953	2965	2956	2927	2875	2798	2641	2496	2402	2486	2633	2814	3000	3170	3298	3286	3240	3189
50	3212	3281	3320	3329	3280	3221	3175	3208	3260	3317	3347	3367	3376	3377	3363	3333	3249	3168	3113
55	3600	3694	3741	3741	3628	3519	3466	3705	3963	4151	3951	3679	3422	3440	3512	3591	3528	3456	3405
60	4506	4466	4425	4383	4339	4296	4253	4211	4171	4130	4059	4011	4008	4158	4333	4493	4518	4504	4467
65	5342	5470	5560	5612	5643	5624	5542	5272	4999	4797	4915	5116	5338	5427	5486	5526	5566	5601	5633
70	3393	3382	3514	3787	4270	4845	5463	6132	6702	7082	6948	6610	6149	5707	5254	4822	4447	4155	3978
75	1578	1530	1601	1792	2060	2479	3081	4293	5454	6299	5961	5228	4285	3474	2711	2069	1758	1606	1578
80	594	550	587	706	955	1249	1551	1743	1930	2135	2536	2885	3090	2784	2351	1901	1706	1595	1558
85	13.6	5.27	8.56	23.5	46.4	83.6	138	234	336	431	507	548	538	375	199	63.2	150	282	414
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	1313	1313	1313	1314	1314	1314	1315	1316	1317	1315	1314	1315	1327	1339	1347	1337	1323	1309	1306
5	1340	1341	1343	1345	1347	1350	1355	1359	1363	1362	1359	1352	1337	1323	1315	1329	1348	1368	1375
10	1435	1431	1429	1428	1430	1434	1444	1456	1466	1467	1467	1467	1473	1480	1490	1503	1517	1530	1539
15	1574	1573	1576	1596	1619	1641	1655	1664	1667	1662	1652	1641	1627	1617	1616	1646	1681	1715	1724
20	1713	1716	1731	1783	1837	1880	1864	1835	1809	1827	1849	1867	1840	1809	1785	1803	1832	1863	1877
25	2033	2072	2114	2129	2132	2123	2090	2054	2023	2034	2047	2048	1985	1916	1855	1854	1869	1890	1887
30	1747	1780	1829	1883	1953	2039	2188	2324	2418	2365	2263	2136	2031	1932	1845	1782	1742	1726	1749
35	1900	1937	1982	2009	2036	2066	2122	2168	2192	2139	2066	1988	1944	1913	1896	1899	1915	1939	1969
40	2554	2557	2535	2457	2356	2244	2110	2003	1951	2085	2254	2411	2399	2361	2330	2420	2524	2618	2631
45	3233	3283	3320	3315	3263	3147	2831	2515	2277	2380	2576	2803	2913	2997	3058	3098	3125	3143	3159
50	3173	3254	3328	3301	3262	3231	3288	3354	3409	3378	3335	3302	3356	3418	3465	3408	3342	3295	3374
55	3497	3602	3682	3570	3453	3392	3642	3917	4131	3970	3738	3516	3541	3617	3703	3684	3657	3639	3709
60	4458	4434	4389	4265	4140	4043	4071	4133	4206	4237	4258	4270	4236	4225	4270	4530	4812	5050	5063
65	5681	5723	5753	5793	5785	5701	5321	4950	4702	5007	5423	5827	5901	5858	5717	5422	5126	4907	5019
70	4014	4173	4431	4739	5122	5579	6328	6982	7374	6878	6133	5314	4898	4540	4193	3630	3119	2749	2791
75	1570	1673	1906	2338	2903	3584	4635	5565	6155	5599	4701	3677	3023	2474	2039	1761	1596	1531	1506
80	1564	1639	1792	2159	2519	2781	2588	2314	2064	2226	2417	2535	2273	1884	1417	894	411	35.5	0.00
85	386	350	346	543	751	910	829	680	500	375	265	175	127	97.0	77.9	51.2	29.7	15.1	14.7
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table--3 UNIT: cd

γ (DEG) \ C (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	1306	1307	1307	1307	1307	1305	1305	1305	1310	1316	1320	1320	1318	1316	1315	1314	1314	1313	1313
5	1377	1377	1377	1375	1373	1369	1366	1365	1374	1384	1394	1398	1400	1401	1402	1404	1406	1412	1418
10	1545	1550	1553	1554	1554	1550	1547	1547	1558	1570	1577	1563	1544	1526	1521	1521	1528	1546	1565
15	1727	1725	1721	1717	1714	1719	1726	1731	1726	1720	1717	1724	1734	1745	1753	1760	1763	1758	1751
20	1887	1896	1908	1918	1925	1918	1911	1909	1933	1958	1973	1948	1912	1876	1860	1852	1849	1850	1857
25	1887	1896	1934	1981	2031	2082	2125	2151	2131	2099	2068	2071	2080	2086	2064	2041	2024	2040	2061
30	1794	1854	1922	1994	2065	2129	2183	2222	2244	2242	2209	2108	1989	1872	1791	1735	1708	1732	1782
35	2002	2034	2045	2062	2091	2185	2278	2344	2301	2229	2149	2117	2091	2067	2016	1970	1940	1969	2010
40	2614	2572	2526	2459	2371	2202	2049	1951	2049	2207	2391	2530	2650	2742	2773	2778	2768	2779	2777
45	3176	3197	3289	3345	3325	2991	2639	2371	2529	2796	3095	3257	3363	3404	3295	3156	3035	3080	3158
50	3468	3547	3497	3429	3371	3430	3500	3552	3480	3390	3309	3341	3383	3405	3292	3168	3071	3128	3216
55	3782	3832	3727	3627	3585	3853	4136	4338	4110	3799	3498	3481	3527	3599	3590	3574	3560	3587	3610
60	4991	4856	4676	4486	4315	4223	4185	4206	4313	4475	4679	4955	5222	5439	5474	5445	5378	5357	5306
65	5232	5492	5755	5950	6017	5590	5140	4835	5329	5936	6457	6284	5936	5522	5274	5087	4981	5013	5133
70	3015	3373	3706	4161	4774	6011	7158	7931	7343	6335	5149	4289	3531	2915	2565	2375	2323	2318	2457
75	1593	1818	2333	2939	3567	4154	4613	4865	4620	4171	3600	3019	2457	1971	1721	1588	1552	1542	1633
80	37.5	246	605	1017	1429	1722	1955	2121	2194	2206	2167	2101	1997	1855	1607	1377	1221	1318	1503
85	19.7	27.3	30.6	33.6	36.4	33.0	33.8	43.1	89.3	135	166	135	88.6	40.0	21.8	11.9	8.02	3.05	3.35
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	ALED5S150/D10	Sample ID	201214003-S1
Temperature (°C)	25.4	Humidity (%RH)	41.0

Test Method
The samples were tested according to the ANSI C82.77:2014 The total harmonic distortion shall be measured to the 40th order. The ambient temperature shall be maintained at 25±1°C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion was calculated.

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD(%)
120.0	60	1.182	141.4	0.9946	5.78
277.0	60	0.5362	136.9	0.9215	9.72

5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2020-11-12	2021-11-11
NTC-F01-006	2.0 meter Integrating Sphere	2020-11-12	2021-11-11
NTC-F01-012	Standard Lamp	2020-11-12	2021-11-11
NTC-F01-013	Standard Lamp	2020-11-12	2021-11-11
NTC-F01-031	Digital Power Meter	2020-08-22	2021-08-21
NTC-F01-019	Temperature & Humidity Meter	2020-11-13	2021-11-12

************End of Report************