



Photometric Test Report

Relevant Standards

- IES LM-79-2008
- ANSI C82.77:2014

Prepared For RAB Lighting Inc.

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Project Number

DLF2408110

Report Number

DLF2408110-5a

Test Date

2024/8/26

Issue Date

2024/9/3

Prepared By

Wangzun Zhu

Approved By

Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v5.1

Outdoor - Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2 (0°-180° zones)	IES LM-79-2008	300		140
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2) (0°-180° zones)	IES LM-79-2008	Standard 105	Premium 120	16.7
Luminaire Output (lm) (Goniophotometer - Section 4.2) (0°-90° zones)	IES LM-79-2008	300		119
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard 105	Premium 120	14.2
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		8.40
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	9.32%
		20.00%	277V	20.89%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.989
		0.9	277V	0.904
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3045±175	3068
		4 step	3045±100	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥70		85
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	-		19
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		86
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89		98
IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-18% ≤ IES Rcs,h1 ≤ +23%		-10%
Zonal Lumen Requirement (80°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≤10%		10.11%
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.034
(Goniophotometer - Section 4.2)		Non-Worst Case		0.066
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		8.40
(Goniophotometer - Section 4.2)		Non-Worst Case		7.85

2.0 Test List

Test Item	Test	Test Date	Model Number	Build Level	Sample No.
1	Integrating Sphere Test	2024/8/26	SA-TWP	ES1-02	E1
2	Goniophotometer Test	2024/8/26	SA-TWP	ES1-02	E1
3	THD and PF Test	2024/8/26	SA-TWP	ES1-02	E1

Remark(If any)

1、 This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.

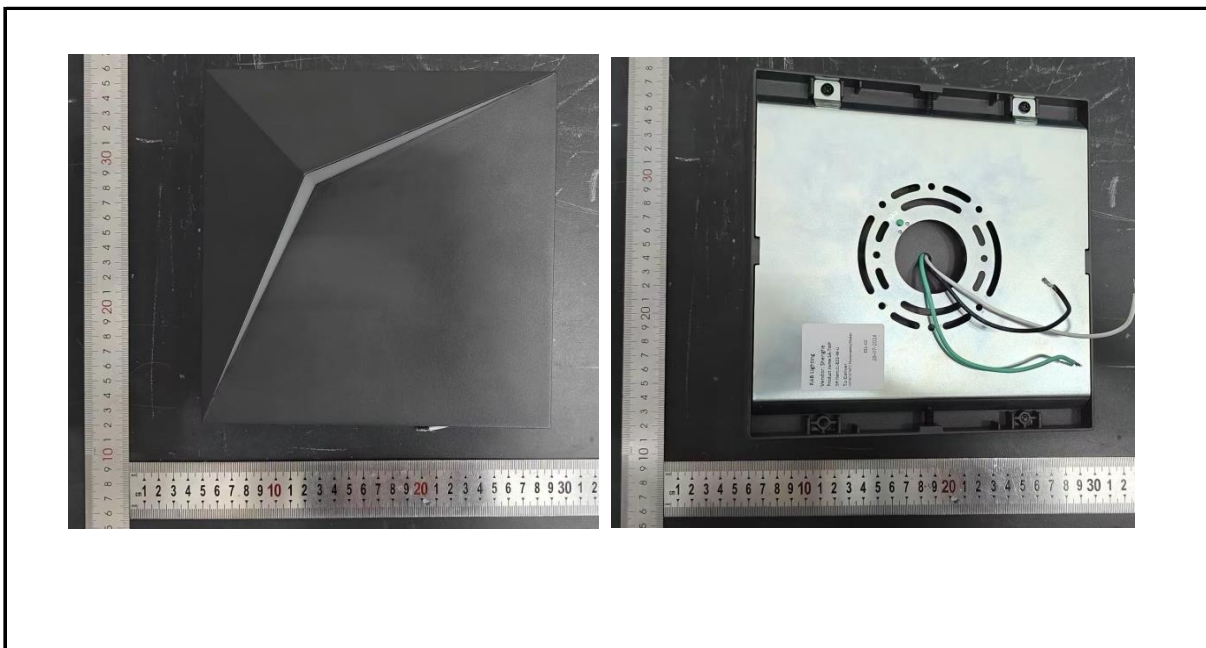
2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

3.0 Production Description

Luminaire Description: SA-TWP

Electrical Specification: 120V-277V,50/60HZ

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	SA-TWP	Sample ID.	E1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.1	Humidity (%RH)	57.0

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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.04	60	0.066	7.89	0.989
277.05	60	0.034	8.44	0.904

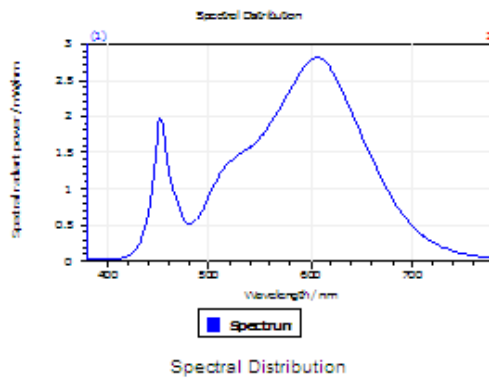
Test Result

CCT (K)	CRI	R9	Duv
3068	85	19	-0.0032

Rf	Rg	IES Rcs,h1
86	98	-10%

4.1 Integrating Sphere Test

Results



Spectral values

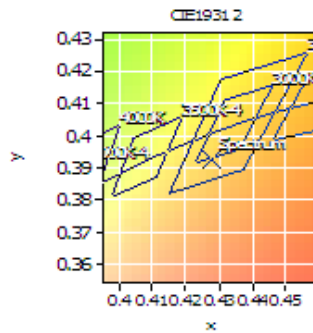
DominantWavelength 583.79 nm
 Purity 0.463
 PeakWavelength 606.16 nm
 Radiant Power 0.4336 W
 Width50%:

Color Coordinates

Correlated Color Temperat 3088 K
 x: 0.4278 u: 0.2494 u': 0.2494
 y: 0.3930 v: 0.3437 v': 0.5155

CRI01	85.0	CRI09	19.4
CRI02	93.3	CRI10	84.4
CRI03	95.7	CRI11	83.8
CRI04	83.4	CRI12	74.3
CRI05	84.9	CRI13	87.3
CRI06	91.6	CRI14	98.5
CRI07	83.6	CRI15	78.4
CRI08	63.8	CRI16	75.8

ResultsCRI 85.2



PlanckDistance 3.2E-003

4.1 Integrating Sphere Test

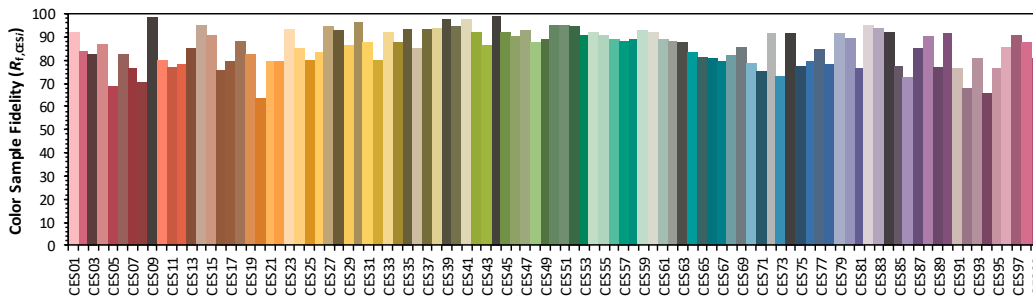
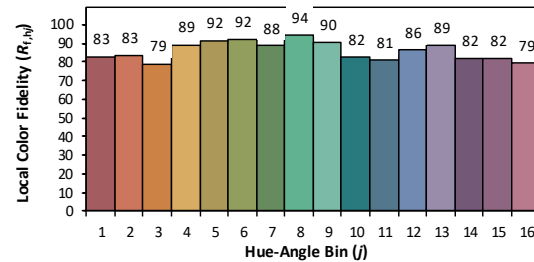
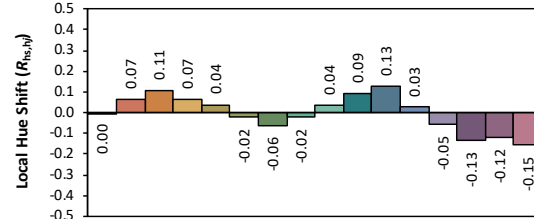
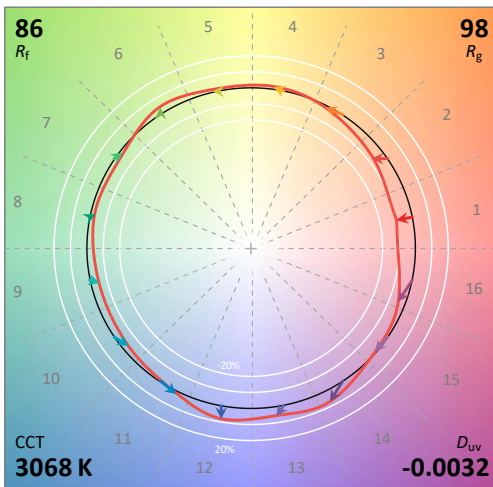
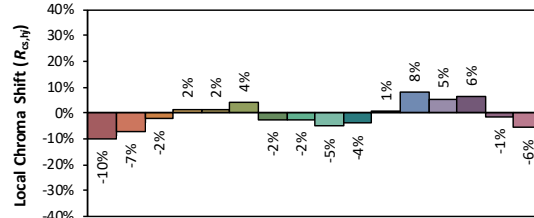
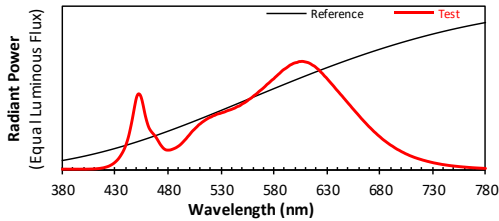
IES TM-30-18 Color Rendition Report

Source: DLF2408110-5a

Manufacturer: RAB Lighting Inc.

Date: 2024/8/26

Model: SA-TWP



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

x 0.4278
 y 0.3930
 u' 0.2494
 v' 0.5155

CIE 13.3-1995 (CRI)	
R_a	86
R_g	24

4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength							
WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)
380	2.42E-05	485	5.48E-04	590	2.61E-03	695	5.64E-04
385	2.38E-05	490	6.22E-04	595	2.71E-03	700	4.87E-04
390	2.33E-05	495	7.50E-04	600	2.77E-03	705	4.17E-04
395	2.40E-05	500	9.05E-04	605	2.80E-03	710	3.58E-04
400	2.41E-05	505	1.06E-03	610	2.79E-03	715	3.08E-04
405	2.57E-05	510	1.19E-03	615	2.74E-03	720	2.65E-04
410	3.04E-05	515	1.29E-03	620	2.65E-03	725	2.27E-04
415	4.19E-05	520	1.37E-03	625	2.52E-03	730	1.94E-04
420	6.66E-05	525	1.43E-03	630	2.37E-03	735	1.66E-04
425	1.14E-04	530	1.47E-03	635	2.21E-03	740	1.42E-04
430	2.05E-04	535	1.52E-03	640	2.05E-03	745	1.21E-04
435	3.65E-04	540	1.57E-03	645	1.90E-03	750	1.05E-04
440	6.36E-04	545	1.63E-03	650	1.74E-03	755	9.03E-05
445	1.15E-03	550	1.71E-03	655	1.57E-03	760	7.83E-05
450	1.86E-03	555	1.79E-03	660	1.42E-03	765	6.69E-05
455	1.84E-03	560	1.89E-03	665	1.27E-03	770	5.73E-05
460	1.25E-03	565	2.01E-03	670	1.12E-03	775	4.99E-05
465	9.67E-04	570	2.12E-03	675	9.86E-04	780	4.33E-05
470	7.86E-04	575	2.24E-03	680	8.65E-04		
475	5.82E-04	580	2.36E-03	685	7.52E-04		
480	5.16E-04	585	2.49E-03	690	6.52E-04		

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	SA-TWP	Sample ID.	E1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric paramters were measured using a type C 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 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 0.5° vertical intervals and 10° horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.05	60	0.034	8.40	0.904
NON-WORST CASE	120.01	60	0.066	7.85	0.989

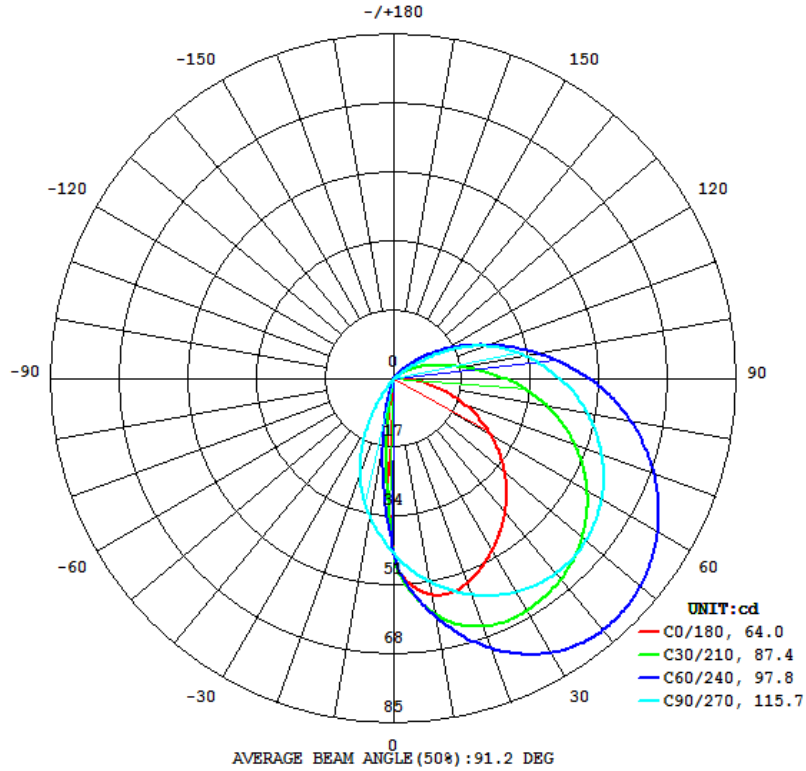
Test Result

Result type	Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		C0-180	C90-270	C0-180	C90-270	
0°-180° zones	140	94.9	160.4	64.0	115.7	16.7
0°-90° zones	119	94.9	125.1	64.0	103.1	14.2

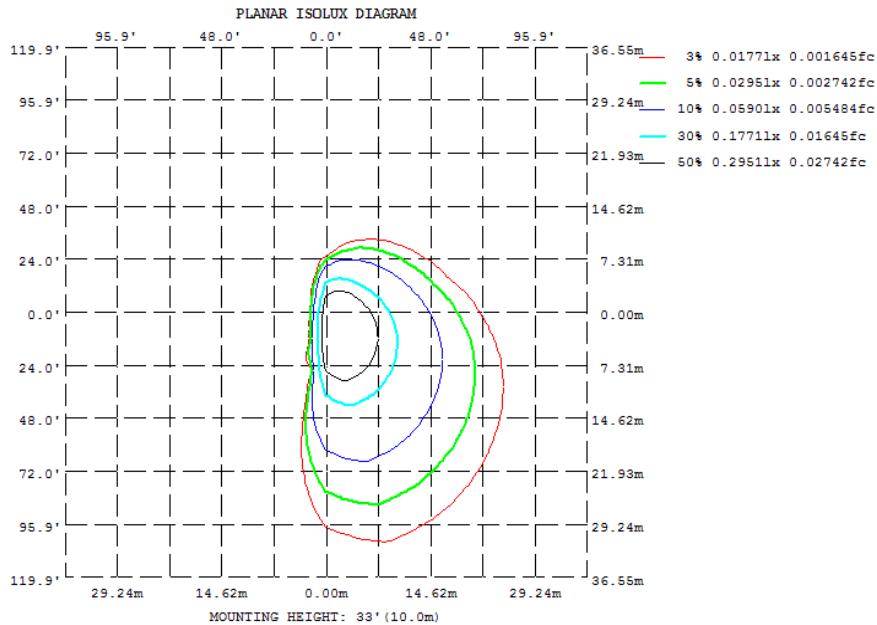
Zonal Lumen Requirement (80°-90°)	BUG rating
10.11%	B0-U2-G1

4.2 Goniophotometer Test

Light Distribution Curve



Isolux Plot



4.2 Goniophotometer Test

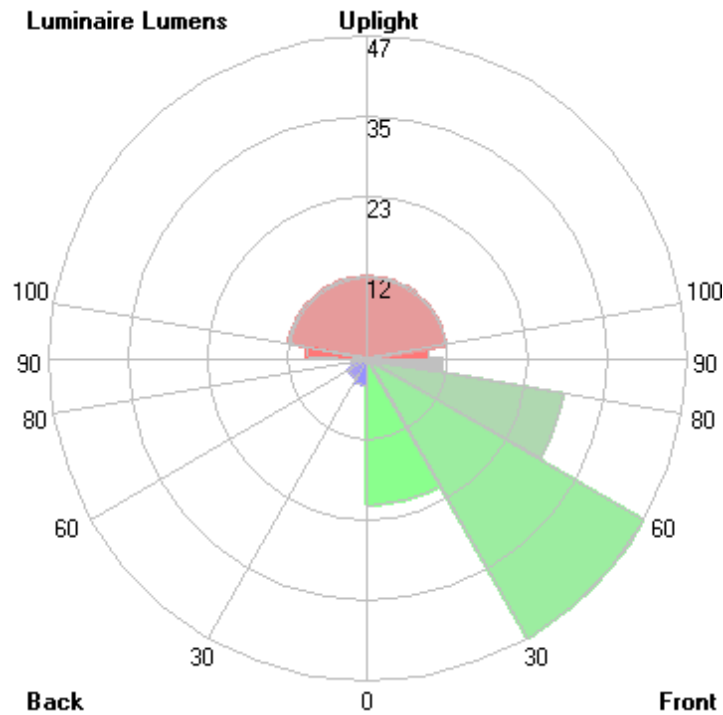
Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	54.20	59.89	50.78	14.83	6.018	10.83	34.66	44.97
20	53.64	69.35	56.81	0.1441	0.0038	0.1441	24.71	37.67
30	48.94	73.46	60.85	0.0089	0.0038	0.0082	12.58	27.21
40	43.16	73.78	62.68	0.0073	0.0038	0.0105	1.336	17.73
50	36.20	71.50	62.26	0.0065	0.0038	0.0142	0.0107	10.32
60	28.00	66.73	59.59	0.0053	0.0042	0.0174	0.0153	4.480
70	18.77	59.62	55.01	0.0047	0.0044	0.0182	0.0178	0.8000
80	9.338	50.39	48.82	0.0042	0.0049	0.0182	0.0218	0.2811
90	2.191	39.60	41.40	0.0042	0.0071	0.0222	0.0263	0.2211
100	0.7291	28.11	33.38	0.0062	0.0176	0.0403	0.0339	0.1754
110	0.5340	17.99	24.02	0.0100	0.0280	0.0554	0.0403	0.1370
120	0.3878	10.71	12.47	0.0149	0.0345	0.0616	0.0436	0.1036
130	0.2654	4.696	1.508	0.0231	0.0465	0.0674	0.0543	0.0832
140	0.1649	0.9152	0.0140	0.0307	0.0592	0.0690	0.0612	0.0758
150	0.0939	0.0800	0.0202	0.0376	0.0621	0.0536	0.0480	0.0589
160	0.0550	0.0396	0.0258	0.0414	0.0552	0.0380	0.0378	0.0500
170	0.0423	0.0278	0.0306	0.0436	0.0436	0.0276	0.0345	0.0478
180	0.0398	0.0260	0.0349	0.0436	0.0394	0.0254	0.0314	0.0414
DEG	LUMINOUS INTENSITY:cd							

	Zonal (lm)	Total (lm)	Percent
0-10	3.54	0 - 10	3.54 2.54%
10-20	8.82	0 - 20	12.36 8.86%
20-30	12.83	0 - 30	25.19 18.06%
30-40	15.52	0 - 40	40.71 29.18%
40-50	17.03	0 - 50	57.74 41.39%
50-60	17.54	0 - 60	75.28 53.96%
60-70	16.72	0 - 70	92.00 65.95%
70-80	14.75	0 - 80	106.75 76.52%
80-90	12.00	0 - 90	118.75 85.12%
90-100	8.97	0 - 100	127.72 91.55%
100-110	6.10	0 - 110	133.82 95.92%
110-120	3.61	0 - 120	137.43 98.51%
120-130	1.59	0 - 130	139.02 99.65%
130-140	0.40	0 - 140	139.42 99.94%
140-150	0.06	0 - 150	139.48 99.98%
150-160	0.02	0 - 160	139.50 99.99%
160-170	0.01	0 - 170	139.51 100.00%
170-180	0.00	0 - 180	139.51 100.00%

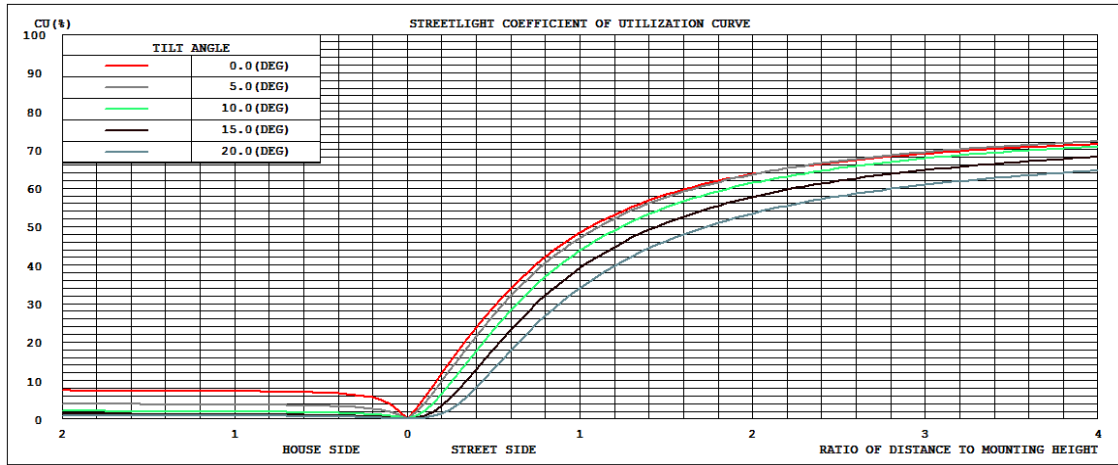
4.2 Goniophotometer Test

LCS/BUG

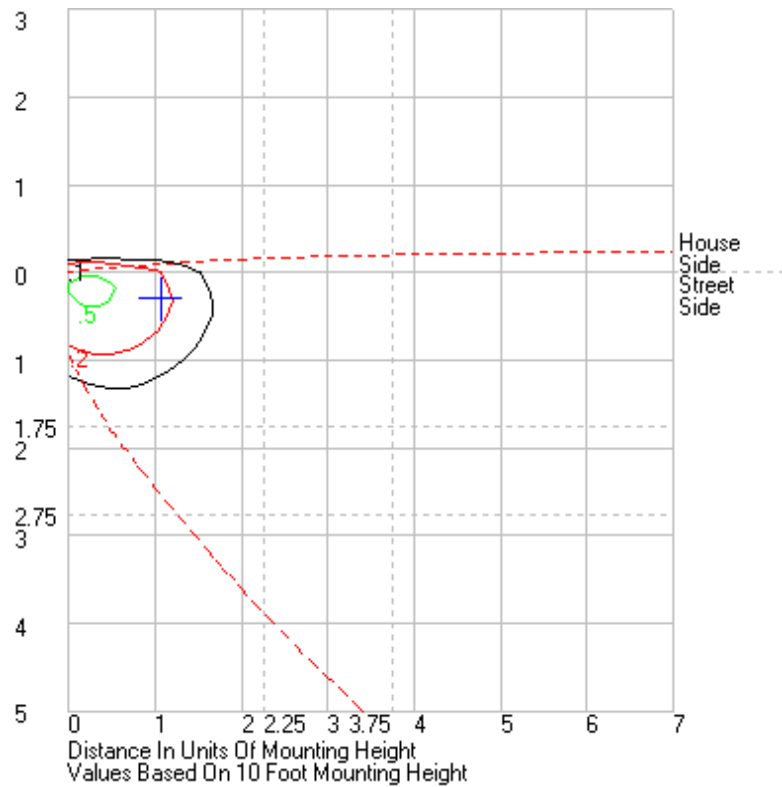


	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	21.3	N.A.	15.3
FM - Front-Medium (30-60)	46.8	N.A.	33.6
FH - Front-High (60-80)	29.1	N.A.	20.9
FVH - Front-Very High (80-90)	11.0	N.A.	7.9
BL - Back-Low (0-30)	3.9	N.A.	2.8
BM - Back-Medium (30-60)	3.3	N.A.	2.3
BH - Back-High (60-80)	2.3	N.A.	1.7
BVH - Back-Very High (80-90)	1.0	N.A.	0.7
UL - Uplight-Low (90-100)	9.0	N.A.	6.4
UH - Uplight-High (100-180)	11.8	N.A.	8.5
Total	139.5	N.A.	100.0
BUG Rating	B0-U2-G1		

Coefficients of Utilization



Isolines





4.2 Goniophotometer Test

	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360
0	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05
1	46.42	46.55	46.61	46.38	45.87	45.05	43.93	42.57	41.2	39.98	38.93	38.22	38.56	38.69	38.96	39.48	40.31	41.29	42.28	43.27	44.08	44.79	45.36	45.77	46.42
2	47.92	48.38	48.54	48.43	47.94	46.78	44.72	42.07	39.4	36.95	34.99	33.46	33.64	33.62	34.26	35.49	37.22	39.3	41.49	43.33	44.7	45.69	46.51	47.15	47.92
3	49.13	49.77	50.11	50.09	49.61	48.4	45.56	41.48	37.43	33.84	31.02	29.07	28.9	28.99	29.84	31.67	34.21	37.34	40.63	43.19	44.74	45.97	47.09	48.07	49.13
4	50.15	51.06	51.6	51.64	51.15	49.93	46.35	40.81	35.39	30.73	27.21	24.87	24.43	24.5	25.73	27.96	31.31	35.42	39.79	42.88	44.58	46.09	47.57	48.86	50.15
5	51.1	52.26	53	53.12	52.61	51.27	47.11	40.12	33.36	27.73	23.63	20.9	20.39	20.46	21.75	24.45	28.42	33.51	38.93	42.42	44.35	46.17	47.91	49.52	51.1
6	51.95	53.4	54.35	54.59	54.02	52.56	47.91	39.32	31.26	24.87	20.26	17.56	16.94	17.06	18.38	21.27	25.75	31.66	38.11	41.9	44.02	46.11	48.17	50.09	51.95
7	52.67	54.4	55.53	55.97	55.43	53.81	48.63	38.52	29.25	22.18	17.32	14.24	13.79	13.92	15.44	18.23	23.11	29.79	37.29	41.28	43.61	45.94	48.3	50.5	52.67
8	53.29	55.29	56.73	57.33	56.86	55.04	49.39	37.64	27.25	19.52	14.42	11.5	10.64	10.79	12.5	15.71	20.69	28.01	36.42	40.62	43.14	45.72	48.27	50.83	53.29
9	53.79	56.15	57.83	58.61	58.17	56.23	50.08	36.73	25.24	17.14	11.95	8.96	8.15	8.35	9.91	13.27	18.45	26.3	35.57	39.9	42.59	45.37	48.25	51.05	53.79
10	54.2	56.87	58.85	59.89	59.46	57.42	50.78	35.77	23.34	14.83	9.65	6.82	6.02	6.24	7.71	10.83	16.25	24.6	34.66	39.11	41.97	44.97	48.06	51.13	54.2
11	54.5	57.5	59.84	61.1	60.75	58.59	51.48	34.77	21.44	12.67	7.56	5.08	4.23	4.46	5.9	8.91	14.4	22.98	33.73	38.31	41.33	44.49	47.81	51.15	54.5
12	54.7	58.06	60.66	62.23	62.03	59.71	52.16	33.79	19.61	10.7	5.8	3.35	2.72	2.97	4.29	7.12	12.56	21.36	32.8	37.44	40.61	43.95	47.46	51.06	54.7
13	54.81	58.5	61.51	63.28	63.23	60.85	52.8	32.72	17.86	8.85	4.21	2.01	1.49	1.8	3	5.62	10.79	19.78	31.86	36.56	39.87	43.36	47.06	50.9	54.81
14	54.84	58.86	62.22	64.36	64.43	61.96	53.46	31.67	16.12	7.15	2.75	0.91	0.56	0.85	1.92	4.3	9.24	18.29	30.88	35.65	39.07	42.72	46.57	50.64	54.84
15	54.77	59.15	62.86	65.35	65.62	63.05	54.04	30.61	14.45	5.72	1.53	0.16	0.04	0.21	1.08	3.17	7.83	16.83	29.89	34.73	38.26	42	45.99	50.31	54.77
16	54.69	59.37	63.42	66.28	66.71	64.13	54.65	29.47	12.89	4.29	0.57	0.02	0	0	0.47	2.24	6.56	15.41	28.89	33.79	37.38	41.24	45.38	49.93	54.69
17	54.49	59.52	63.98	67.13	67.83	65.18	55.22	28.36	11.33	2.94	0.04	0.01	0	0	0.07	1.47	5.41	14.09	27.88	32.75	36.49	40.39	44.7	49.45	54.49
18	54.25	59.57	64.4	67.94	68.85	66.21	55.79	27.24	9.88	1.8	0.01	0.01	0	0	0	0.87	4.4	12.76	26.84	31.75	35.53	39.55	44	48.96	54.25
19	53.94	59.61	64.77	68.67	69.86	67.18	56.33	26.08	8.47	0.84	0.01	0.01	0	0	0	0.44	3.5	11.48	25.76	30.74	34.56	38.63	43.21	48.39	53.94
20	53.64	59.61	65.11	69.35	70.84	68.21	56.81	24.95	7.09	0.14	0.01	0.01	0	0	0	0.14	2.71	10.27	24.71	29.66	33.57	37.67	42.38	47.79	53.64
21	53.28	59.54	65.38	70	71.79	69.09	57.34	23.79	5.9	0.01	0.01	0.01	0	0	0	0.01	2.04	9.14	23.65	28.6	32.53	36.7	41.54	47.16	53.28
22	52.86	59.41	65.61	70.56	72.66	70.06	57.79	22.59	4.72	0.01	0.01	0.01	0	0	0	0.01	1.46	8.04	22.49	27.48	31.48	35.71	40.66	46.48	52.86
23	52.4	59.3	65.78	71.1	73.47	70.94	58.24	21.45	3.55	0.01	0.01	0.01	0	0	0.01	0.01	0.99	7.01	21.37	26.36	30.4	34.68	39.75	45.83	52.4
24	51.99	59.14	65.94	71.57	74.28	71.82	58.67	20.26	2.5	0.01	0.01	0.01	0	0	0.01	0.01	0.62	6.03	20.18	25.24	29.33	33.64	38.85	45.1	51.99
25	51.5	58.93	66.04	71.99	75.03	72.66	59.1	19.06	1.52	0.01	0.01	0.01	0	0	0.01	0.01	0.34	5.11	19	24.07	28.22	32.58	37.89	44.36	51.5
26	51.02	58.74	66.11	72.37	75.73	73.47	59.46	17.92	0.72	0.01	0.01	0.01	0	0	0.01	0.01	0.16	4.22	17.72	22.91	27.08	31.51	36.94	43.64	51.02
27	50.5	58.51	66.16	72.7	76.37	74.26	59.81	16.7	0.12	0.01	0.01	0.01	0	0	0.01	0.01	0.05	3.37	16.42	21.73	25.99	30.45	35.98	42.88	50.5
28	50.02	58.26	66.17	73	76.98	74.99	60.18	15.56	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	2.6	15.12	20.5	24.86	29.34	35.03	42.15	50.02
29	49.47	57.96	66.13	73.22	77.56	75.7	60.49	14.38	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	1.91	13.85	19.31	23.76	28.28	34.04	41.37	49.47
30	48.94	57.72	66.09	73.46	78.07	76.38	60.85	13.22	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	1.29	12.58	18.13	22.67	27.21	33.06	40.58	48.94
31	48.41	57.41	66.03	73.65	78.53	77.02	61.1	12.07	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.78	11.32	16.99	21.59	26.15	32.09	39.78	48.41
32	47.85	57.1	65.95	73.77	78.95	77.65	61.34	10.91	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.34	10.08	15.83	20.52	25.13	31.13	39.02	47.85
33	47.32	56.79	65.84	73.85	79.34	78.22	61.62	9.79	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.05	8.85	14.74	19.45	24.1	30.15	38.21	47.32
34	46.76	56.44	65.73	73.94	79.66	78.78	61.78	8.68	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	7.66	13.67	18.45	23.13	29.22	37.44	46.76
35	46.18	56.08	65.57	73.98	79.95	79.28	62.03	7.59	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	6.48	12.61	17.42	22.16	28.24	36.65	46.18
36	45.61	55.76	65.42	74.03	80.25	79.76	62.17	6.51	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	5.34	11.56	16.47	21.24	27.3	35.84	45.61
37	45.01	55.38	65.22	73.96	80.44	80.19	62.31	5.49	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	4.26	10.58	15.52	20.33	26.38	35.04	45.01
38	44.43	55.02	65.03	73.96	80.63	80.58	62.45	4.46	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	3.21	9.63	14.61	19.45	25.45	34.2	44.43
39	43.77	54.62	64.81	73.88	80.72	80.95	62.55	3.45	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	2.23	8.72	13.73	18.6	24.53	33.42	43.77
40	43.16	54.18	64.57	73.78	80.83	81.27	62.68	2.52	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	1.34	7.85	12.85	17.73	23.65	32.6	43.16
41	42.52	53.74	64.34	73.67	80.9	81.58	62.66	1.61	0	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.62	7.04	12.02	16.91	22.77	31.76	42.52
42	41.86	53.3	64	73.51	80.93	81.83	62.78	0.82	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.12	6.25	11.21	16.11	21.92	30.93	41.86
43	41.19	52.85	63.79	73.36	80.92	82	62.78	0.21	0	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	5.52	10.44	15.33	21.09	30.09	41.19
44	40.5	52.35	63.46	73.15	80.84	82.17	62.74	0.01	0	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	4.83	9.68	14.57	20.27	29.24	40.5
45	39.81	51.87	63.13	72.94	80.77	82.34	62.78	0	0	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	4.19	8.97	13.83	19.48	28.38	39.81
46	39.12	51.34	62.75	72.7	80.63	82.4	62.65	0	0	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	3.6	8.28	13.1	18.68	27.55	39.12
47	38.39	50.83	62.36	72.42	80.45	82.44	62.62	0	0	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	3.04	7.62	12.37	17.92	26.68	38.39
48	37.71	50.29	61.98	72.14	80.28	82.47	62.51	0	0																



50	36.2	49.11	61.11	71.5	79.81	82.37	62.26	0	0	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	1.66	5.79	10.32	15.75	24.12	36.2
51	35.42	48.51	60.61	71.1	79.53	82.29	62.03	0	0	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	1.3	5.24	9.66	15.05	23.24	35.42
52	34.64	47.9	60.14	70.73	79.22	82.12	61.92	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.01	0.01	0.98	4.72	9.02	14.35	22.37	34.64
53	33.86	47.26	59.64	70.31	78.86	81.95	61.68	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.01	0.01	0.72	4.23	8.4	13.68	21.5	33.86
54	33.05	46.6	59.1	69.85	78.48	81.76	61.45	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.01	0.01	0.5	3.75	7.79	12.97	20.66	33.05
55	32.24	45.97	58.59	69.42	78.07	81.49	61.2	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.01	0.33	3.32	7.19	12.27	19.79	32.24
56	31.38	45.25	58.01	68.9	77.66	81.17	60.89	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.01	0.21	2.9	6.62	11.6	18.94	31.38
57	30.6	44.6	57.46	68.41	77.25	80.86	60.65	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.01	0.12	2.51	6.06	10.93	18.09	30.6
58	29.7	43.83	56.84	67.86	76.74	80.48	60.29	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.01	0.07	2.16	5.51	10.27	17.25	29.7
59	28.85	43.09	56.2	67.31	76.22	80.11	60.02	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.01	0.05	1.83	4.98	9.62	16.41	28.85
60	28	42.37	55.58	66.73	75.7	79.68	59.59	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.05	1.53	4.48	8.98	15.59	28
61	27.08	41.57	54.88	66.08	75.11	79.21	59.26	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.05	1.26	3.99	8.35	14.79	27.08
62	26.23	40.81	54.23	65.49	74.51	78.73	58.91	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.05	1.02	3.53	7.72	13.98	26.23
63	25.27	39.98	53.47	64.8	73.88	78.22	58.36	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.05	0.81	3.09	7.12	13.21	25.27
64	24.39	39.17	52.74	64.13	73.27	77.68	58.05	0	0	0.01	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.05	0.63	2.66	6.52	12.44	24.39
65	23.47	38.33	51.99	63.43	72.57	77.07	57.54	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.05	0.48	2.27	5.93	11.66	23.47
66	22.54	37.46	51.22	62.7	71.87	76.47	57.05	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.36	1.92	5.37	10.9	22.54
67	21.62	36.61	50.47	61.99	71.14	75.8	56.64	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.27	1.58	4.81	10.17	21.62
68	20.66	35.71	49.62	61.21	70.37	75.12	56.11	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.21	1.28	4.28	9.49	20.66
69	19.74	34.83	48.82	60.44	69.61	74.42	55.56	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.17	1.03	3.78	8.8	19.74
70	18.77	33.89	47.95	59.62	68.8	73.69	55.01	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.16	0.8	3.29	8.12	18.77
71	17.82	32.98	47.08	58.78	68	72.95	54.54	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.15	0.63	2.82	7.47	17.82
72	16.87	32.05	46.23	57.97	67.13	72.14	53.88	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.14	0.5	2.4	6.81	16.87
73	15.89	31.07	45.27	57.06	66.28	71.33	53.32	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.14	0.4	2	6.18	15.89
74	14.98	30.15	44.41	56.2	65.39	70.51	52.78	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.14	0.35	1.65	5.55	14.98
75	13.98	29.14	43.44	55.25	64.44	69.63	52.12	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.13	0.33	1.33	4.96	13.98
76	13.07	28.19	42.51	54.33	63.55	68.74	51.5	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.13	0.32	1.07	4.38	13.07
77	12.12	27.15	41.56	53.38	62.59	67.8	50.87	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.13	0.31	0.86	3.82	12.12
78	11.17	26.17	40.54	52.39	61.61	66.88	50.21	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.12	0.3	0.71	3.3	11.17
79	10.27	25.18	39.59	51.43	60.63	65.91	49.52	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.12	0.29	0.59	2.81	10.27
80	9.34	24.11	38.53	50.39	59.63	64.92	48.82	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.12	0.28	0.54	2.36	9.34
81	8.5	23.13	37.54	49.4	58.61	63.98	48.18	0	0	0	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.12	0.27	0.51	1.95	8.5
82	7.6	22.06	36.48	48.35	57.52	62.95	47.4	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.11	0.27	0.49	1.6	7.6
83	6.78	21.06	35.43	47.28	56.5	61.92	46.74	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.02	0.04	0.11	0.26	0.47	1.3	6.78
84	6	20.03	34.37	46.23	55.4	60.87	45.96	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.02	0.04	0.11	0.25	0.46	1.08	6
85	5.23	18.97	33.27	45.15	54.33	59.82	45.21	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.02	0.04	0.11	0.25	0.45	0.91	5.23
86	4.53	17.98	32.23	44.08	53.23	58.75	44.48	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.02	0.04	0.1	0.24	0.43	0.78	4.53
87	3.83	16.92	31.1	42.96	52.12	57.64	43.67	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.02	0.04	0.1	0.24	0.42	0.73	3.83
88	3.22	15.94	30.05	41.85	50.99	56.53	42.94	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.03	0.03	0.1	0.23	0.41	0.69	3.22
89	2.66	14.92	28.97	40.73	49.8	55.42	42.14	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.1	0.23	0.4	0.65	2.66
90	2.19	13.96	27.86	39.6	48.69	54.28	41.4	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.1	0.22	0.39	0.63	2.19
91	1.81	13.04	26.79	38.48	47.53	53.14	40.55	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.09	0.22	0.38	0.61	1.81
92	1.5	12.08	25.66	37.3	46.31	51.96	39.76	0	0	0	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.09	0.21	0.38	0.6	1.5
93	1.27	11.23	24.62	36.19	45.16	50.79	39.02	0	0	0	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.09	0.21	0.37	0.58	1.27
94	1.13	10.35	23.53	35.02	43.93	49.58	38.14	0	0	0	0.01	0.02	0.01	0.01	0.01	0.02	0.03	0.03	0.03	0.03	0.09	0.2	0.36	0.56	1.13
95	1	9.56	22.46	33.87	42.77	48.4	37.4	0	0	0.01	0.01	0.02	0.01	0.02	0.02	0.03	0.04	0.04	0.03	0.03	0.09	0.2	0.35	0.55	1
96	0.88	8.82	21.43	32.73	41.57	47.17	36.6	0	0	0.01	0.01	0.02	0.01	0.02	0.02	0.03	0.04	0.04	0.03	0.03	0.09	0.19	0.34	0.54	0.88
97	0.82	8.12	20.36	31.55	40.33	45.96	35.8	0	0	0.01	0.01	0.02	0.01	0.02	0.02	0.03	0.04	0.04	0.03	0.03	0.08	0.19	0.33	0.52	0.82
98	0.79	7.52	19.38	30.4	39.11	44.75	35.08	0	0	0.01	0.01	0.02	0.01	0.02	0.03	0.04	0.04	0.04	0.03	0.03	0.08	0.18	0.33	0.51	0.79
99	0.75	6.93	18.38	29.24	37.89	43.5	34.24	0	0	0.01	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.04	0.03	0.03	0.08	0.18	0.32	0.5	0.75
100	0.73	6.49	17.44	28.11	36.66	42.28	33.38	0.01	0	0.01	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.04	0.03	0.03	0.08	0.18	0.31	0.48	0.73
101	0.7	6.04	16.52	26.98	35.43	41.02	32.53	0.01	0	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.05	0.04	0.03	0.03	0.08	0.17	0.3	0.47	0.7
102	0.68	5.6	15.64	25.87	34.22	39.78	31.66	0.01	0	0.01	0.01	0.02	0.02	0.03											



104	0.64	4.8	14.04	23.68	31.78	37.26	29.82	0.01	0	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.05	0.04	0.03	0.07	0.16	0.28	0.44	0.64	
105	0.62	4.44	13.34	22.65	30.6	36.02	28.91	0.01	0	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.05	0.04	0.03	0.07	0.16	0.28	0.43	0.62	
106	0.6	4.07	12.67	21.62	29.39	34.73	27.92	0.01	0	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.05	0.04	0.03	0.07	0.15	0.27	0.42	0.6	
107	0.58	3.73	12.06	20.66	28.24	33.5	27.01	0.01	0	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.05	0.04	0.03	0.07	0.15	0.26	0.41	0.58	
108	0.57	3.4	11.46	19.72	27.06	32.22	25.99	0.01	0	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.05	0.04	0.04	0.07	0.14	0.26	0.4	0.57	
109	0.55	3.08	10.87	18.83	25.93	30.96	24.99	0.01	0	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.05	0.04	0.04	0.07	0.14	0.25	0.38	0.55	
110	0.53	2.78	10.31	17.99	24.82	29.7	24.02	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.06	0.05	0.04	0.04	0.07	0.14	0.24	0.37	0.53	
111	0.52	2.49	9.73	17.19	23.72	28.42	22.93	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.06	0.05	0.04	0.04	0.06	0.13	0.24	0.36	0.52	
112	0.5	2.23	9.18	16.44	22.68	27.19	21.93	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.06	0.05	0.04	0.04	0.06	0.13	0.23	0.36	0.5	
113	0.49	1.97	8.64	15.68	21.68	25.93	20.81	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.06	0.05	0.04	0.04	0.06	0.13	0.22	0.35	0.49	
114	0.47	1.74	8.11	14.95	20.69	24.69	19.71	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.05	0.04	0.04	0.06	0.12	0.22	0.34	0.47	
115	0.46	1.53	7.59	14.22	19.74	23.48	18.6	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.05	0.04	0.04	0.06	0.12	0.21	0.33	0.46	
116	0.44	1.33	7.07	13.48	18.79	22.25	17.39	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.05	0.04	0.04	0.06	0.12	0.2	0.32	0.44	
117	0.43	1.16	6.59	12.79	17.86	21.03	16.16	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.05	0.04	0.04	0.06	0.11	0.2	0.31	0.43	
118	0.41	1	6.12	12.07	16.92	19.78	14.91	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.05	0.04	0.04	0.06	0.11	0.19	0.3	0.41	
119	0.4	0.87	5.65	11.39	16.01	18.59	13.71	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.05	0.04	0.04	0.06	0.11	0.19	0.29	0.4	
120	0.39	0.75	5.2	10.71	15.12	17.39	12.47	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.05	0.04	0.04	0.06	0.1	0.18	0.28	0.39	
121	0.37	0.66	4.75	10.02	14.21	16.22	11.28	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.07	0.05	0.04	0.04	0.06	0.1	0.17	0.27	0.37	
122	0.36	0.58	4.33	9.37	13.35	15.07	10.08	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.05	0.05	0.04	0.05	0.1	0.17	0.26	0.36	
123	0.35	0.49	3.91	8.72	12.48	13.93	8.89	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.05	0.05	0.04	0.05	0.1	0.16	0.25	0.35	
124	0.34	0.46	3.52	8.08	11.64	12.83	7.73	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.07	0.06	0.05	0.04	0.05	0.09	0.16	0.25	0.34	
125	0.32	0.43	3.15	7.48	10.8	11.76	6.58	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.07	0.06	0.05	0.04	0.06	0.09	0.15	0.24	0.32	
126	0.31	0.41	2.79	6.87	9.98	10.71	5.5	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.07	0.06	0.05	0.04	0.05	0.09	0.15	0.23	0.31	
127	0.3	0.39	2.45	6.31	9.2	9.69	4.42	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.07	0.06	0.05	0.04	0.05	0.09	0.14	0.22	0.3	
128	0.29	0.37	2.13	5.75	8.42	8.7	3.41	0.01	0.01	0.02	0.03	0.04	0.04	0.05	0.06	0.07	0.07	0.06	0.05	0.05	0.06	0.09	0.14	0.21	0.29	
129	0.28	0.36	1.84	5.22	7.67	7.75	2.42	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.07	0.06	0.05	0.05	0.06	0.08	0.13	0.2	0.28	
130	0.27	0.34	1.57	4.7	6.95	6.83	1.51	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.07	0.06	0.05	0.05	0.06	0.08	0.13	0.2	0.27	
131	0.25	0.32	1.33	4.2	6.28	6.01	0.77	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.07	0.06	0.06	0.05	0.06	0.08	0.12	0.19	0.25	
132	0.24	0.31	1.11	3.72	5.62	5.18	0.22	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.07	0.06	0.06	0.05	0.06	0.08	0.12	0.18	0.24	
133	0.23	0.29	0.91	3.27	4.96	4.4	0.02	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.07	0.06	0.06	0.05	0.06	0.08	0.12	0.18	0.23	
134	0.22	0.28	0.74	2.84	4.36	3.68	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.07	0.06	0.06	0.05	0.06	0.08	0.11	0.17	0.22	
135	0.21	0.26	0.59	2.44	3.78	3	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.07	0.06	0.06	0.05	0.06	0.08	0.11	0.16	0.21	
136	0.2	0.25	0.47	2.07	3.24	2.37	0.01	0.02	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.08	0.11	0.16	0.2	
137	0.19	0.23	0.38	1.73	2.74	1.8	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.08	0.1	0.15	0.19	
138	0.18	0.22	0.31	1.43	2.27	1.29	0.01	0.02	0.02	0.03	0.04	0.04	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.08	0.1	0.14	0.18	
139	0.17	0.21	0.25	1.16	1.85	0.85	0.01	0.02	0.02	0.03	0.04	0.04	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.08	0.1	0.14	0.17	
140	0.16	0.2	0.22	0.92	1.47	0.5	0.01	0.02	0.02	0.03	0.04	0.04	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.08	0.09	0.13	0.16	
141	0.16	0.18	0.2	0.71	1.13	0.24	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.07	0.09	0.12	0.16	
142	0.15	0.17	0.18	0.54	0.84	0.08	0.02	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.07	0.09	0.12	0.15	
143	0.14	0.16	0.17	0.4	0.59	0.04	0.02	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.07	0.08	0.11	0.14	
144	0.13	0.15	0.16	0.29	0.39	0.04	0.02	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.07	0.08	0.11	0.13	
145	0.13	0.14	0.15	0.2	0.25	0.04	0.02	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.07	0.08	0.1	0.13	
146	0.12	0.13	0.13	0.15	0.15	0.04	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.07	0.08	0.1	0.12	
147	0.11	0.12	0.12	0.11	0.09	0.03	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.05	0.05	0.05	0.05	0.07	0.08	0.09	0.11
148	0.11	0.12	0.11	0.1	0.06	0.03	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.05	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.06	0.07	0.09	0.11	
149	0.1	0.11	0.11	0.09	0.06	0.03	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.07	0.08	0.1	
150	0.09	0.1	0.1	0.08	0.05	0.03	0.02	0.03	0.03	0.04	0.04	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.07	0.08	0.09	
151	0.09	0.09	0.09	0.07	0.05	0.03	0.02	0.03	0.03	0.04	0.04	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.07	0.08	0.09	
152	0.08	0.09	0.08	0.07	0.05	0.03	0.02	0.03	0.03	0.04	0.04	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.07	0.08	0.08	
153	0.08	0.08	0.08	0.06	0.04	0.03	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.07	0.07	0.08	
154	0.07	0.07	0.07	0.06	0.04	0.03	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.05	0.06	0.07	0.07	0.07	
155	0.07	0.07	0.07	0.06	0.04	0.03	0.02	0.03	0.03	0.04																

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	SA-TWP	Sample ID.	E1
Temperature (°C)	25.1	Humidity (%RH)	57.0

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 condition was maintained at 25° C ± 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 were calculated.

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.04	60	0.066	7.89	0.989	9.32%
277.05	60	0.034	8.44	0.904	20.89%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2023/12/24	2024/12/23
DLF108	Auxiliary Lamp	2023/12/24	2024/12/23
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2023/12/24	2024/12/23
DLF116	AC Power Source	2023/12/16	2024/12/15
DLF516	Power Meter	2023/12/16	2024/12/15
DLF112	Temperature Recorder	2023/12/28	2024/12/27
DLF114	Temperature & Humidity Datalogger	2023/12/28	2024/12/27
DLF101	Goniophotometer	2023/12/24	2024/12/23
DLF511	AC Power Source	2023/12/16	2024/12/15
DLF512	AC Power Source	2023/12/16	2024/12/15
DLF513	AC Power Source	2023/12/16	2024/12/15
DLF507	DC Power Source	2023/12/16	2024/12/15
DLF111	Temperature & Humidity Datalogger	2023/12/28	2024/12/27
DLF119	Power Meter	2023/12/16	2024/12/15
DLF031	Temperature data logger	2024/6/20	2025/6/19
DLF073	Power Analyzer	2024/6/20	2025/6/19
DLF003	Temperature & Humidity Datalogger	2024/6/20	2025/6/19

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