



Photometric Test Report

Relevant Standards

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

Prepared For RAB Lighting Inc.

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DLF2408110-4a

Test Date

2024/8/16

Issue Date

2024/8/19

Prepared By

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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		257
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2) (0°-180° zones)	IES LM-79-2008	Standard 105	Premium 120	30.4
Luminaire Output (lm) (Goniophotometer - Section 4.2) (0°-90° zones)	IES LM-79-2008	300		131
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard 105	Premium 120	15.5
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		8.46
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	9.39%
		20.00%	277V	20.99%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.989
		0.9	277V	0.903
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3045±175	2973
		4 step	3045±100	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥70		83
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	-		10
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		85
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89		97
IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-18% ≤ IES Rcs,h1 ≤ +23%		-11%
Zonal Lumen Requirement (80°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≤10%		22.54%
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		8.46
(Goniophotometer - Section 4.2)		Non-Worst Case		7.88

2.0 Test List

Test Item	Test	Test Date	Model Number	Build Level	Sample No.
1	Integrating Sphere Test	2024/8/16	SA-MUWP	ES1-02	D1
2	Goniophotometer Test	2024/8/16	SA-MUWP	ES1-02	D1
3	THD and PF Test	2024/8/16	SA-MUWP	ES1-02	D1

Remark(If any)

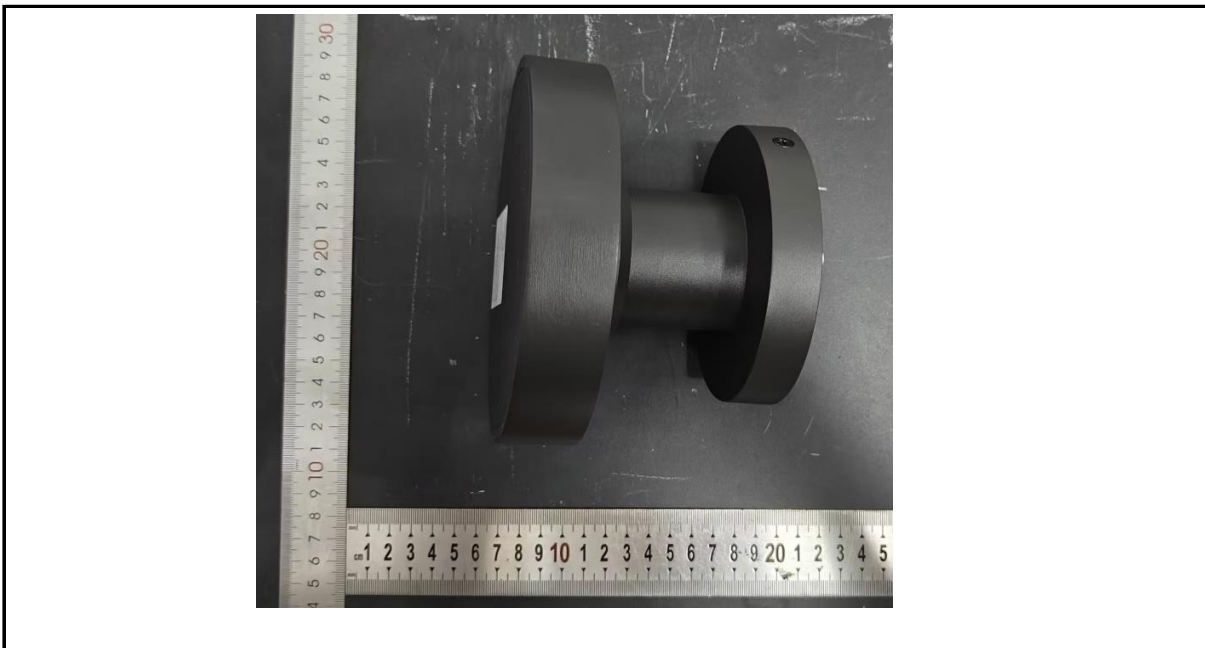
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3.0 Production Description

Luminaire Description: SA-MUWP

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-MUWP	Sample ID.	D1
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
120.06	60	0.066	7.89	0.989
277.03	60	0.034	8.47	0.903

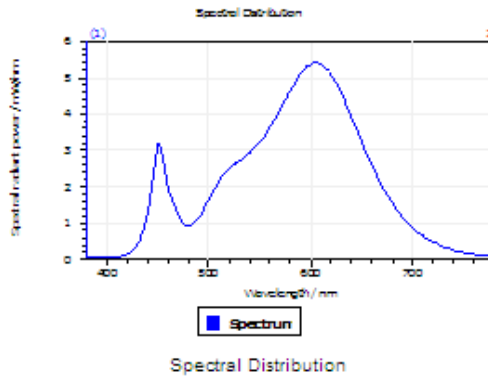
Test Result

CCT (K)	CRI	R9	Duv
2973	83	10	-0.0018

Rf	Rg	IES Rcs,h1
85	97	-11%

4.1 Integrating Sphere Test

Results



Spectral values

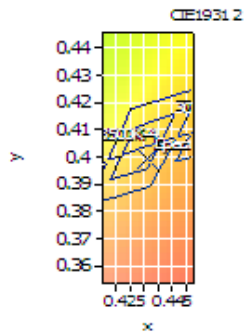
DominantWavelength 583.60 nm
 Purity 0.508
 PeakWavelength 604.75 nm
 Radiant Power 0.8098 W
 Width50%:

Color Coordinates

Correlated Color Temperat 2973 K
 x: 0.4362 u: 0.2522 u': 0.2522
 y: 0.3894 v: 0.3463 v': 0.5194

CRI01	81.8	CRI09	9.5
CRI02	91.6	CRI10	80.8
CRI03	95.9	CRI11	80.6
CRI04	80.9	CRI12	73.1
CRI05	82.0	CRI13	84.2
CRI06	90.0	CRI14	98.5
CRI07	82.0	CRI15	74.3
CRI08	59.1	CRI16	71.9

ResultsCRI 82.9



PlanckDistance 1.8E-003

4.1 Integrating Sphere Test

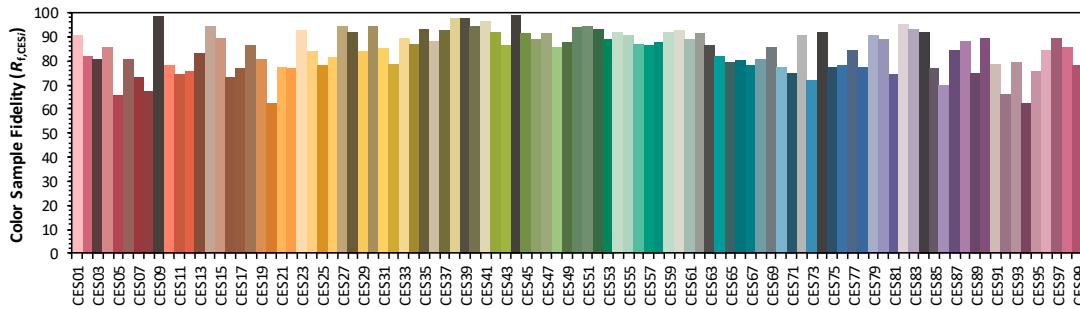
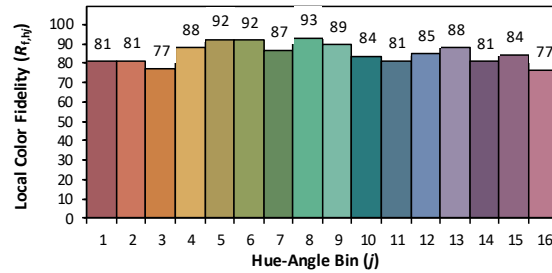
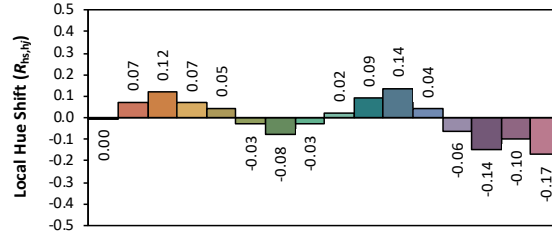
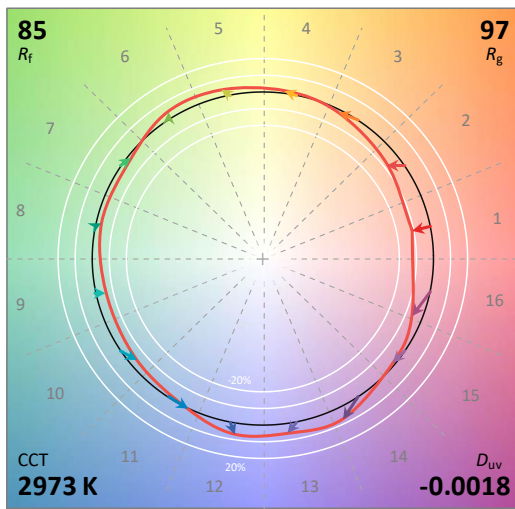
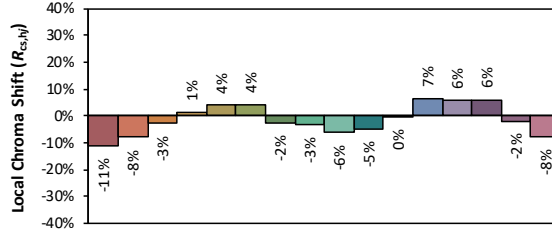
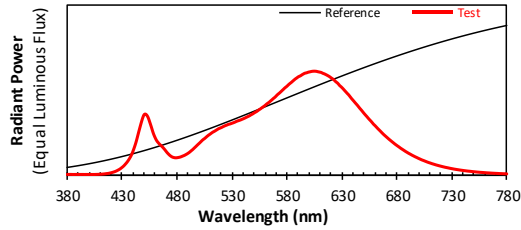
IES TM-30-18 Color Rendition Report

Source: DLF2408110-4a

Manufacturer: RAB Lighting Inc.

Date: 2024/8/16

Model: SA-MUWP



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

x 0.4362
 y 0.3994
 u' 0.2522
 v' 0.5194

CIE 13.3-1995 (CRI)	
R_a	84
R_g	15

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	4.79E-05	485	9.99E-04	590	5.11E-03	695	1.01E-03
385	4.66E-05	490	1.15E-03	595	5.27E-03	700	8.75E-04
390	4.76E-05	495	1.38E-03	600	5.37E-03	705	7.55E-04
395	4.70E-05	500	1.66E-03	605	5.41E-03	710	6.48E-04
400	4.72E-05	505	1.91E-03	610	5.36E-03	715	5.55E-04
405	4.64E-05	510	2.14E-03	615	5.25E-03	720	4.77E-04
410	5.74E-05	515	2.33E-03	620	5.08E-03	725	4.09E-04
415	8.46E-05	520	2.48E-03	625	4.84E-03	730	3.50E-04
420	1.35E-04	525	2.61E-03	630	4.56E-03	735	2.99E-04
425	2.33E-04	530	2.71E-03	635	4.25E-03	740	2.57E-04
430	4.15E-04	535	2.83E-03	640	3.91E-03	745	2.20E-04
435	7.21E-04	540	2.93E-03	645	3.58E-03	750	1.90E-04
440	1.26E-03	545	3.07E-03	650	3.23E-03	755	1.62E-04
445	2.22E-03	550	3.24E-03	655	2.90E-03	760	1.41E-04
450	3.15E-03	555	3.42E-03	660	2.59E-03	765	1.21E-04
455	2.80E-03	560	3.63E-03	665	2.30E-03	770	1.04E-04
460	1.97E-03	565	3.86E-03	670	2.02E-03	775	9.00E-05
465	1.57E-03	570	4.11E-03	675	1.78E-03	780	7.71E-05
470	1.25E-03	575	4.37E-03	680	1.55E-03		
475	9.75E-04	580	4.63E-03	685	1.35E-03		
480	9.18E-04	585	4.88E-03	690	1.17E-03		

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	SA-MUWP	Sample ID.	D1
Operate 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 parameters 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	277.08	60	0.034	8.46	0.903
NON-WORST CASE	120.00	60	0.066	7.88	0.989

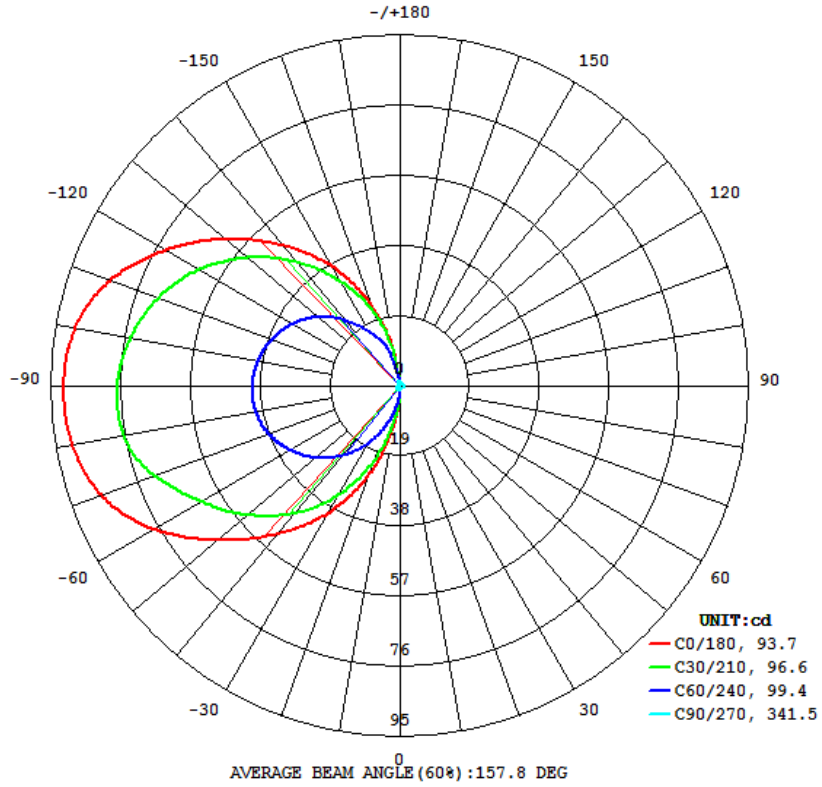
Test Result

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	257	160.0	346.6	93.7	341.5	30.4
0°-90° zones	131	86.2	179.4	42.6	163.1	15.5

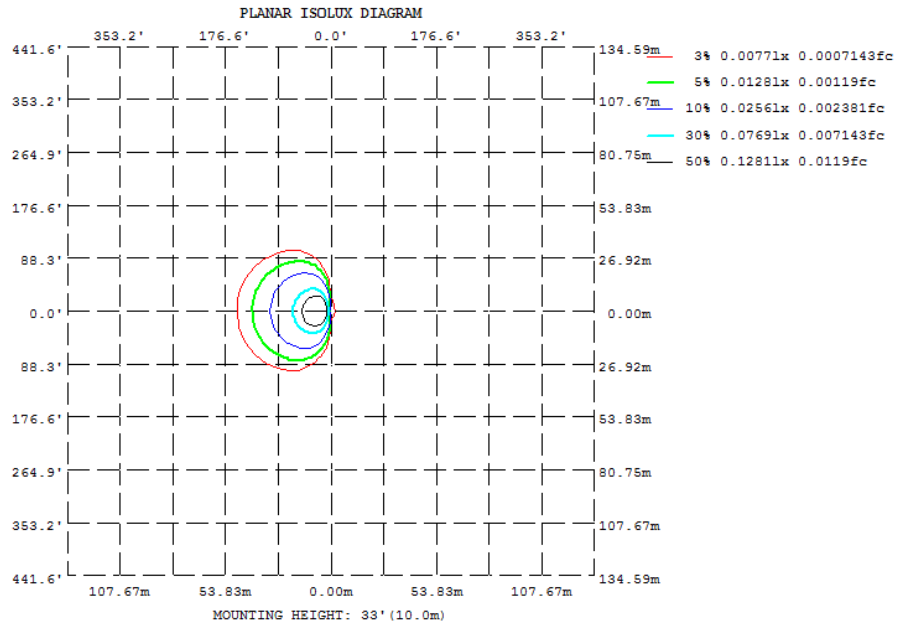
Zonal Lumen Requirement (80°-90°)	BUG rating
22.54%	B0-U3-G1

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

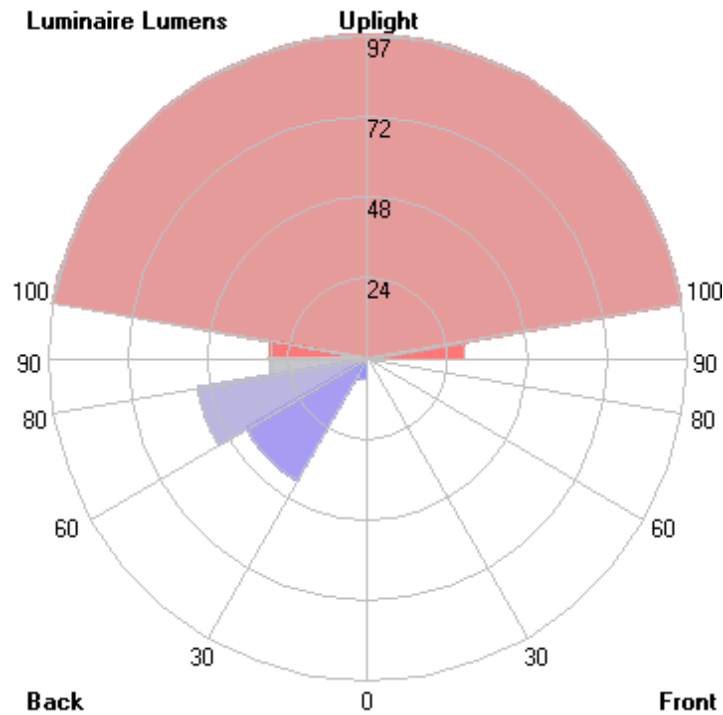
Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	0.8879	1.031	1.224	7.052	11.10	7.307	1.293	1.022
20	0.4675	0.7194	1.139	16.60	25.78	17.15	1.306	0.7140
30	0.1635	0.4458	1.036	26.54	39.83	27.27	1.297	0.4424
40	0.0945	0.2402	0.9520	35.85	52.34	36.51	1.242	0.2312
50	0.1019	0.1165	1.049	44.14	65.18	44.43	1.231	0.1116
60	0.0963	0.0705	1.197	49.90	77.64	50.75	1.219	0.0861
70	0.0781	0.0525	1.323	53.88	86.64	55.30	1.155	0.0718
80	0.0743	0.0449	1.411	56.18	90.67	57.98	1.082	0.0463
90	0.0772	0.0458	1.451	56.43	91.53	58.95	1.011	0.0409
100	0.0800	0.0478	1.445	54.81	89.97	57.95	0.9218	0.0503
110	0.0717	0.0459	1.400	51.34	84.16	55.01	0.8219	0.0569
120	0.0614	0.0469	1.344	46.63	73.92	50.42	0.7227	0.0534
130	0.0507	0.0500	1.273	40.37	62.09	44.12	0.6286	0.0523
140	0.0416	0.1948	1.301	32.73	49.85	35.45	0.5918	0.1186
150	0.0660	0.4220	1.320	23.94	37.56	26.24	0.7869	0.3179
160	0.4248	0.6021	1.316	14.43	23.62	17.49	1.519	0.4514
170	0.0851	0.1568	0.9781	2.472	2.935	2.769	0.6870	0.1341
180	0.0149	0.0242	0.0291	0.0220	0.0145	0.0211	0.0291	0.0251
DEG	LUMINOUS INTENSITY: cd							

	Zonal (lm)	Total (lm)	Percent	
0-10	0.26	0 - 10	0.26	0.10%
10-20	1.75	0 - 20	2.01	0.78%
20-30	4.80	0 - 30	6.81	2.65%
30-40	9.05	0 - 40	15.86	6.17%
40-50	14.07	0 - 50	29.93	11.65%
50-60	19.40	0 - 60	49.33	19.20%
60-70	24.32	0 - 70	73.65	28.66%
70-80	27.91	0 - 80	101.56	39.52%
80-90	29.56	0 - 90	131.12	51.02%
90-100	29.27	0 - 100	160.39	62.41%
100-110	27.09	0 - 110	187.48	72.95%
110-120	23.31	0 - 120	210.79	82.02%
120-130	18.47	0 - 130	229.26	89.21%
130-140	13.29	0 - 140	242.55	94.38%
140-150	8.46	0 - 150	251.01	97.67%
150-160	4.46	0 - 160	255.47	99.41%
160-170	1.48	0 - 170	256.95	99.98%
170-180	0.04	0 - 180	256.99	100.00%

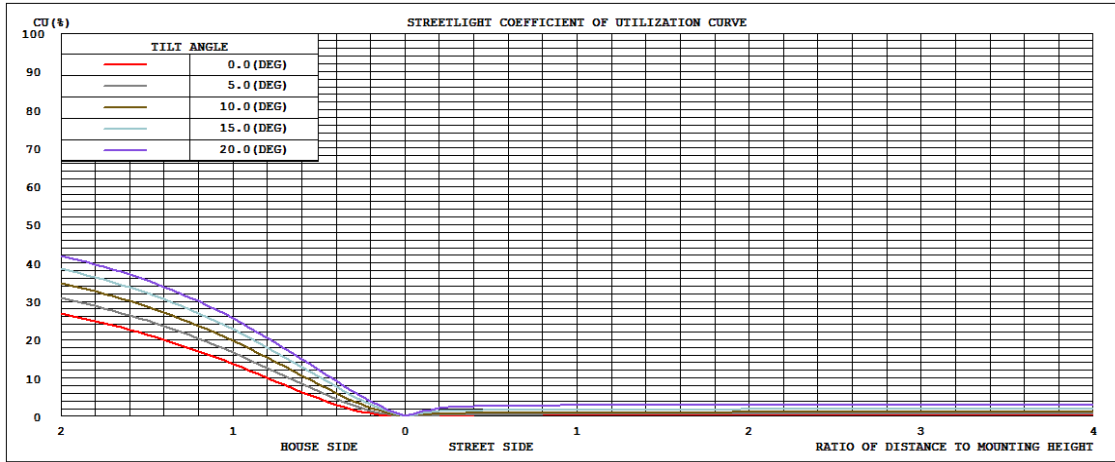
4.2 Goniophotometer Test

LCS/BUG

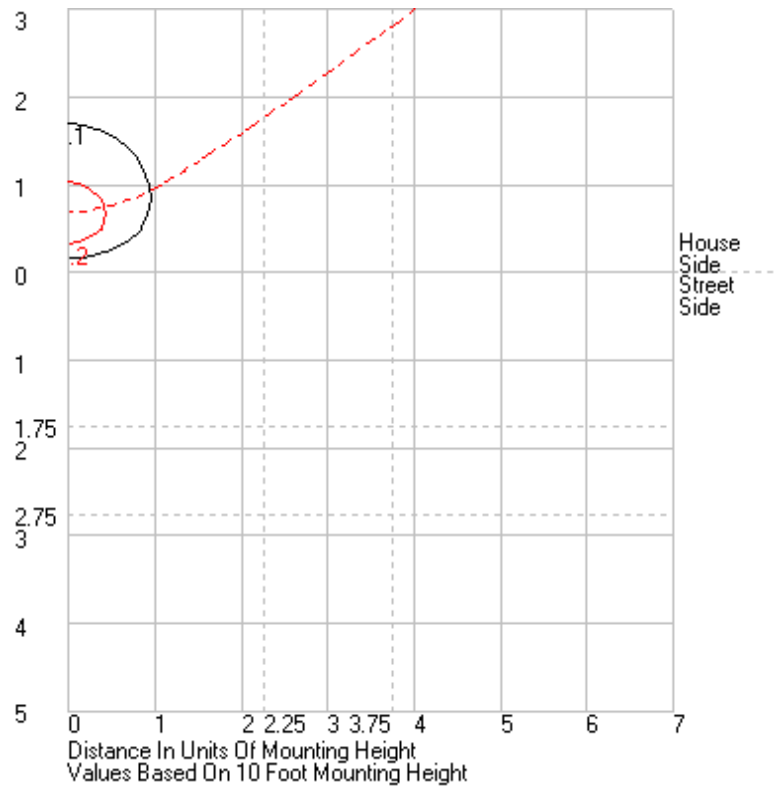


	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	0.3	N.A.	0.1
FM - Front-Medium (30-60)	0.4	N.A.	0.2
FH - Front-High (60-80)	0.3	N.A.	0.1
FVH - Front-Very High (80-90)	0.1	N.A.	0.1
BL - Back-Low (0-30)	6.5	N.A.	2.5
BM - Back-Medium (30-60)	42.1	N.A.	16.4
BH - Back-High (60-80)	51.9	N.A.	20.2
BVH - Back-Very High (80-90)	29.4	N.A.	11.5
UL - Uplight-Low (90-100)	29.3	N.A.	11.4
UH - Uplight-High (100-180)	96.6	N.A.	37.6
Total	256.9	N.A.	100.0
BUG Rating	B0-U3-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	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252	1.252
1	1.17	1.18	1.19	1.2	1.21	1.23	1.26	1.32	1.39	1.47	1.53	1.59	1.57	1.57	1.53	1.47	1.39	1.32	1.26	1.22	1.2	1.19	1.18	1.17	1.17
2	1.15	1.16	1.17	1.19	1.2	1.21	1.26	1.39	1.59	1.8	1.98	2.13	2.15	2.11	1.99	1.81	1.6	1.41	1.27	1.21	1.19	1.18	1.16	1.15	1.15
3	1.13	1.14	1.16	1.18	1.19	1.21	1.25	1.48	1.83	2.22	2.57	2.83	2.9	2.82	2.59	2.25	1.88	1.52	1.27	1.2	1.18	1.17	1.15	1.13	1.13
4	1.11	1.12	1.14	1.16	1.19	1.21	1.25	1.58	2.12	2.73	3.28	3.69	3.83	3.67	3.31	2.79	2.2	1.65	1.28	1.2	1.18	1.15	1.13	1.11	1.11
5	1.08	1.09	1.12	1.15	1.18	1.2	1.25	1.7	2.45	3.3	4.08	4.64	4.82	4.64	4.14	3.4	2.55	1.78	1.28	1.19	1.17	1.13	1.11	1.08	1.08
6	1.05	1.06	1.09	1.13	1.17	1.2	1.25	1.82	2.81	3.95	4.98	5.71	5.9	5.74	5.09	4.09	2.97	1.94	1.28	1.19	1.15	1.11	1.08	1.05	1.05
7	1.01	1.03	1.06	1.11	1.15	1.19	1.24	1.95	3.21	4.66	5.96	6.85	7.12	6.84	6.08	4.83	3.41	2.11	1.28	1.19	1.14	1.09	1.05	1.02	1.01
8	0.97	0.99	1.03	1.08	1.14	1.19	1.24	2.1	3.65	5.42	6.98	8.1	8.39	8.06	7.07	5.63	3.88	2.29	1.29	1.18	1.13	1.07	1.02	0.99	0.97
9	0.93	0.95	0.99	1.06	1.12	1.18	1.23	2.25	4.11	6.21	8.07	9.33	9.71	9.35	8.19	6.45	4.4	2.49	1.29	1.17	1.12	1.05	0.99	0.95	0.93
10	0.89	0.91	0.96	1.03	1.11	1.17	1.22	2.42	4.61	7.05	9.18	10.64	11.1	10.68	9.34	7.31	4.93	2.68	1.29	1.17	1.1	1.02	0.96	0.91	0.89
11	0.84	0.87	0.92	1	1.09	1.16	1.22	2.59	5.12	7.93	10.35	11.99	12.5	12.02	10.53	8.21	5.5	2.9	1.3	1.16	1.08	0.99	0.92	0.88	0.84
12	0.8	0.83	0.89	0.97	1.07	1.15	1.21	2.77	5.65	8.82	11.54	13.37	13.95	13.38	11.72	9.14	6.06	3.13	1.3	1.15	1.06	0.96	0.89	0.84	0.8
13	0.76	0.78	0.85	0.94	1.05	1.14	1.2	2.96	6.21	9.75	12.76	14.76	15.41	14.78	12.95	10.1	6.66	3.36	1.3	1.14	1.04	0.93	0.85	0.8	0.76
14	0.71	0.74	0.81	0.91	1.03	1.13	1.19	3.15	6.78	10.69	13.99	16.15	16.89	16.23	14.22	11.09	7.28	3.61	1.3	1.13	1.02	0.9	0.81	0.76	0.71
15	0.67	0.7	0.77	0.88	1	1.12	1.18	3.35	7.37	11.65	15.22	17.56	18.36	17.65	15.46	12.06	7.9	3.85	1.3	1.12	1	0.87	0.78	0.72	0.67
16	0.63	0.66	0.73	0.84	0.98	1.1	1.17	3.55	7.97	12.63	16.47	18.99	19.85	19.07	16.74	13.07	8.54	4.12	1.3	1.11	0.97	0.84	0.74	0.68	0.63
17	0.58	0.62	0.69	0.81	0.96	1.09	1.17	3.77	8.58	13.62	17.72	20.41	21.33	20.51	18.02	14.08	9.2	4.38	1.3	1.1	0.95	0.81	0.7	0.64	0.58
18	0.54	0.58	0.66	0.78	0.93	1.08	1.16	3.99	9.21	14.61	18.98	21.84	22.81	21.95	19.29	15.09	9.86	4.65	1.31	1.08	0.93	0.78	0.66	0.6	0.54
19	0.51	0.54	0.62	0.75	0.91	1.06	1.15	4.21	9.84	15.58	20.24	23.25	24.3	23.37	20.57	16.12	10.55	4.93	1.3	1.07	0.9	0.75	0.63	0.56	0.51
20	0.47	0.5	0.59	0.72	0.89	1.05	1.14	4.44	10.49	16.6	21.52	24.69	25.78	24.81	21.86	17.15	11.21	5.21	1.31	1.06	0.88	0.71	0.59	0.52	0.47
21	0.43	0.47	0.55	0.69	0.86	1.04	1.13	4.67	11.13	17.59	22.76	26.1	27.24	26.21	23.12	18.15	11.9	5.5	1.31	1.05	0.86	0.68	0.56	0.49	0.43
22	0.4	0.43	0.52	0.66	0.84	1.02	1.12	4.91	11.78	18.6	24.02	27.51	28.69	27.64	24.42	19.19	12.59	5.78	1.3	1.03	0.83	0.66	0.53	0.45	0.4
23	0.36	0.4	0.49	0.63	0.82	1.01	1.11	5.15	12.43	19.62	25.29	28.89	30.15	29.05	25.68	20.23	13.29	6.09	1.31	1.02	0.81	0.63	0.49	0.42	0.36
24	0.33	0.37	0.46	0.6	0.79	0.99	1.1	5.4	13.09	20.6	26.52	30.26	31.57	30.43	26.92	21.25	13.97	6.37	1.3	1.01	0.79	0.6	0.46	0.38	0.33
25	0.3	0.34	0.43	0.58	0.77	0.98	1.09	5.65	13.76	21.6	27.76	31.67	33.01	31.81	28.17	22.27	14.66	6.67	1.3	0.99	0.77	0.57	0.43	0.35	0.3
26	0.27	0.31	0.4	0.55	0.75	0.96	1.08	5.89	14.4	22.6	28.97	33.03	34.42	33.17	29.39	23.29	15.37	6.96	1.3	0.98	0.74	0.54	0.4	0.32	0.27
27	0.24	0.28	0.37	0.52	0.73	0.95	1.07	6.15	15.06	23.59	30.21	34.34	35.78	34.52	30.63	24.3	16.05	7.25	1.3	0.97	0.72	0.52	0.37	0.29	0.24
28	0.21	0.25	0.34	0.5	0.7	0.93	1.06	6.4	15.71	24.59	31.43	35.69	37.14	35.85	31.84	25.29	16.75	7.55	1.3	0.95	0.7	0.49	0.35	0.26	0.21
29	0.19	0.22	0.32	0.47	0.68	0.91	1.05	6.65	16.37	25.55	32.61	37.01	38.51	37.15	33.04	26.29	17.43	7.87	1.3	0.94	0.68	0.47	0.32	0.24	0.19
30	0.16	0.2	0.29	0.45	0.66	0.9	1.04	6.91	17.04	26.54	33.8	38.3	39.83	38.45	34.21	27.27	18.12	8.17	1.3	0.92	0.66	0.44	0.29	0.21	0.16
31	0.14	0.18	0.27	0.42	0.64	0.88	1.02	7.16	17.67	27.5	34.98	39.55	41.13	39.7	35.37	28.24	18.81	8.47	1.29	0.91	0.63	0.42	0.27	0.19	0.14
32	0.12	0.16	0.25	0.4	0.61	0.87	1.01	7.43	18.35	28.46	36.13	40.81	42.43	40.96	36.52	29.23	19.49	8.78	1.29	0.89	0.61	0.39	0.25	0.16	0.12
33	0.11	0.14	0.22	0.38	0.59	0.85	1	7.68	19	29.41	37.29	42.1	43.7	42.19	37.64	30.16	20.16	9.08	1.29	0.88	0.59	0.37	0.22	0.14	0.11
34	0.1	0.12	0.2	0.35	0.57	0.83	0.99	7.95	19.63	30.37	38.42	43.31	44.93	43.39	38.76	31.11	20.83	9.38	1.28	0.86	0.57	0.35	0.2	0.13	0.1
35	0.1	0.11	0.18	0.33	0.55	0.82	0.98	8.2	20.27	31.29	39.55	44.51	46.18	44.6	39.88	32.04	21.5	9.69	1.28	0.85	0.55	0.33	0.18	0.11	0.1
36	0.09	0.1	0.17	0.31	0.53	0.81	0.98	8.47	20.9	32.22	40.63	45.73	47.41	45.8	40.94	32.97	22.17	9.98	1.27	0.83	0.53	0.31	0.16	0.11	0.09
37	0.09	0.1	0.15	0.29	0.51	0.8	0.97	8.73	21.55	33.14	41.76	46.95	48.62	46.94	42.01	33.86	22.81	10.29	1.26	0.81	0.51	0.29	0.14	0.1	0.09
38	0.09	0.09	0.13	0.27	0.5	0.78	0.96	8.99	22.18	34.04	42.82	48.14	49.86	48.08	43.06	34.76	23.45	10.59	1.26	0.8	0.49	0.27	0.13	0.1	0.09
39	0.09	0.09	0.12	0.26	0.48	0.77	0.96	9.26	22.81	34.95	43.89	49.32	51.1	49.19	44.08	35.63	24.08	10.88	1.25	0.78	0.47	0.25	0.12	0.1	0.09
40	0.09	0.09	0.11	0.24	0.47	0.76	0.95	9.52	23.43	35.85	44.96	50.57	52.34	50.34	45.09	36.51	24.69	11.18	1.24	0.77	0.45	0.23	0.11	0.09	0.09
41	0.1	0.09	0.1	0.23	0.45	0.75	0.95	9.78	24.07	36.71	46.01	51.74	53.58	51.49	46.1	37.35	25.32	11.46	1.24	0.75	0.43	0.21	0.1	0.09	0.1
42	0.1	0.1	0.1	0.21	0.44	0.74	0.95	10.04	24.67	37.59	47.04	52.96	54.8	52.63	47.09	38.16	25.93	11.75	1.23	0.74	0.42	0.2	0.1	0.09	0.1
43	0.1	0.1	0.09	0.2	0.42	0.74	0.96	10.28	25.27	38.47	48.09	54.15	56.11	53.75	48.06	39.02	26.51	12.03	1.22	0.72	0.4	0.18	0.1	0.09	0.1
44	0.1	0.1	0.09	0.19	0.41	0.74	0.97	10.53	25.87	39.3	49.12	55.35	57.43	54.9	48.99	39.82	27.12	12.3	1.22	0.71	0.38	0.17	0.09	0.09	0.1
45	0.1	0.1	0.09	0.18	0.4	0.74	0.98	10.77	26.43	40.14	50.13	56.57	58.75	56.1	49.96	40.63	27.69	12.59	1.21	0.7	0.37	0.16	0.09	0.09	0.1
46	0.1	0.1	0.09	0.16	0.39	0.74	1	11.02	26.98	40.97	51.14	57.83	60.05	57.24	50.86	41.42	28.25	12.86	1.22	0.69	0.36	0.15	0.09	0.09	0.1
47	0.1	0.1	0.1	0.15	0.38	0.74	1.01	11.25	27.49	41.8	52.13	59.04	61.36	58.37	51.77	42.19	28.83	13.12	1.22	0.68	0.34	0.14	0.09	0.09	0.1
48	0.1	0.1	0.09	0.14	0.37	0.74	1.02	11.49	28.01	42.6	53.1	60.32	62.64	59.5	52.68	42.95	29.36	13.38	1.22	0.68	0.33	0.13	0.09	0.08	0.1
49	0.1	0.1	0.09	0.13	0.36	0.74	1.04	11.72	28.51	43.39	54.07	61.59	63.94	60.62	53.58	43.71	29.9	13.64</							



50	0.1	0.1	0.09	0.12	0.35	0.74	1.05	11.94	28.98	44.14	55.07	62.81	65.18	61.73	54.47	44.43	30.41	13.9	1.23	0.67	0.31	0.11	0.09	0.08	0.1
51	0.1	0.1	0.09	0.11	0.34	0.75	1.06	12.16	29.46	44.85	56.05	64.02	66.5	62.88	55.39	45.14	30.91	14.14	1.23	0.66	0.31	0.1	0.09	0.08	0.1
52	0.1	0.1	0.09	0.1	0.33	0.75	1.08	12.37	29.91	45.48	57.03	65.23	67.76	64.07	56.28	45.86	31.41	14.38	1.23	0.66	0.3	0.1	0.09	0.08	0.1
53	0.1	0.1	0.09	0.09	0.33	0.75	1.09	12.58	30.37	46.11	57.96	66.43	69.05	65.26	57.19	46.53	31.88	14.62	1.23	0.65	0.29	0.1	0.09	0.08	0.1
54	0.1	0.09	0.09	0.08	0.32	0.75	1.11	12.79	30.8	46.72	58.91	67.58	70.32	66.49	58.07	47.22	32.34	14.85	1.23	0.64	0.28	0.09	0.09	0.08	0.1
55	0.1	0.09	0.08	0.07	0.31	0.75	1.12	12.99	31.21	47.3	59.84	68.68	71.56	67.75	58.93	47.86	32.8	15.08	1.23	0.64	0.27	0.09	0.09	0.08	0.1
56	0.1	0.09	0.08	0.07	0.3	0.76	1.14	13.18	31.61	47.87	60.83	69.79	72.8	69.05	59.68	48.47	33.23	15.29	1.23	0.63	0.26	0.09	0.08	0.08	0.1
57	0.1	0.09	0.08	0.07	0.29	0.76	1.15	13.36	31.99	48.41	61.71	70.84	74.04	70.33	60.41	49.04	33.66	15.51	1.23	0.63	0.26	0.09	0.08	0.08	0.1
58	0.1	0.09	0.08	0.07	0.29	0.76	1.17	13.54	32.39	48.92	62.64	71.86	75.28	71.64	61.14	49.64	34.1	15.72	1.23	0.62	0.25	0.09	0.08	0.08	0.1
59	0.1	0.09	0.08	0.07	0.28	0.76	1.18	13.71	32.75	49.43	63.5	72.9	76.47	72.9	61.92	50.18	34.48	15.92	1.22	0.61	0.24	0.09	0.08	0.08	0.1
60	0.1	0.09	0.08	0.07	0.27	0.77	1.2	13.87	33.1	49.9	64.27	73.87	77.64	74.09	62.72	50.75	34.91	16.13	1.22	0.61	0.24	0.09	0.08	0.09	0.1
61	0.1	0.09	0.08	0.07	0.27	0.77	1.21	14.04	33.43	50.38	64.99	74.83	78.77	75.29	63.55	51.27	35.29	16.31	1.21	0.6	0.23	0.09	0.08	0.09	0.1
62	0.1	0.09	0.08	0.07	0.26	0.77	1.23	14.19	33.76	50.84	65.68	75.78	79.83	76.46	64.42	51.77	35.67	16.5	1.21	0.59	0.22	0.08	0.08	0.09	0.1
63	0.1	0.09	0.08	0.07	0.25	0.77	1.24	14.34	34.07	51.23	66.33	76.67	80.91	77.57	65.31	52.28	36.02	16.67	1.2	0.59	0.21	0.08	0.08	0.09	0.1
64	0.09	0.09	0.08	0.07	0.24	0.77	1.25	14.48	34.35	51.67	67.01	77.53	81.86	78.64	66.16	52.76	36.39	16.85	1.2	0.58	0.21	0.08	0.08	0.09	0.09
65	0.09	0.09	0.08	0.07	0.24	0.78	1.27	14.62	34.63	52.1	67.63	78.37	82.8	79.66	66.95	53.22	36.71	17.02	1.19	0.57	0.2	0.08	0.08	0.09	0.09
66	0.09	0.08	0.07	0.07	0.23	0.78	1.28	14.76	34.91	52.48	68.26	79.19	83.69	80.64	67.84	53.68	37.04	17.17	1.18	0.56	0.19	0.08	0.08	0.09	0.09
67	0.09	0.08	0.07	0.06	0.22	0.78	1.29	14.88	35.16	52.84	68.86	80	84.5	81.52	68.72	54.09	37.36	17.33	1.18	0.56	0.19	0.08	0.08	0.09	0.09
68	0.08	0.08	0.07	0.06	0.21	0.78	1.3	15	35.39	53.2	69.44	80.7	85.27	82.36	69.62	54.51	37.65	17.48	1.17	0.55	0.18	0.08	0.07	0.08	0.08
69	0.08	0.07	0.07	0.06	0.21	0.78	1.31	15.11	35.62	53.57	69.98	81.38	85.99	83.17	70.43	54.9	37.94	17.62	1.16	0.55	0.17	0.07	0.07	0.08	0.08
70	0.08	0.07	0.06	0.05	0.2	0.78	1.32	15.22	35.84	53.88	70.47	82.06	86.64	83.9	71.25	55.3	38.2	17.76	1.15	0.54	0.17	0.07	0.07	0.08	0.08
71	0.08	0.07	0.06	0.05	0.19	0.78	1.33	15.32	36.05	54.21	70.96	82.68	87.24	84.6	72.02	55.64	38.48	17.88	1.15	0.53	0.16	0.07	0.07	0.08	0.08
72	0.07	0.07	0.06	0.05	0.18	0.78	1.34	15.42	36.22	54.49	71.39	83.24	87.79	85.22	72.76	55.98	38.71	18.01	1.14	0.52	0.15	0.06	0.06	0.07	0.07
73	0.07	0.07	0.06	0.05	0.18	0.78	1.35	15.51	36.4	54.8	71.8	83.75	88.26	85.81	73.43	56.26	38.93	18.12	1.13	0.51	0.14	0.06	0.06	0.07	0.07
74	0.07	0.07	0.06	0.05	0.17	0.78	1.36	15.59	36.56	55.06	72.22	84.29	88.76	86.31	74.09	56.56	39.14	18.22	1.12	0.5	0.14	0.06	0.06	0.07	0.07
75	0.07	0.07	0.06	0.05	0.17	0.78	1.37	15.66	36.7	55.29	72.54	84.76	89.16	86.77	74.68	56.86	39.33	18.31	1.11	0.5	0.13	0.05	0.05	0.06	0.07
76	0.07	0.07	0.06	0.04	0.17	0.78	1.38	15.73	36.84	55.53	72.89	85.13	89.53	87.17	75.22	57.09	39.49	18.37	1.1	0.49	0.13	0.05	0.05	0.06	0.07
77	0.07	0.07	0.06	0.04	0.16	0.78	1.39	15.79	36.97	55.71	73.16	85.5	89.84	87.51	75.62	57.36	39.65	18.45	1.1	0.49	0.12	0.05	0.05	0.06	0.07
78	0.07	0.07	0.06	0.04	0.16	0.78	1.4	15.85	37.07	55.9	73.4	85.84	90.16	87.78	75.92	57.59	39.78	18.52	1.09	0.48	0.12	0.05	0.05	0.06	0.07
79	0.07	0.07	0.06	0.04	0.15	0.79	1.4	15.9	37.17	56.07	73.63	86.15	90.44	88.04	76.21	57.78	39.89	18.57	1.09	0.48	0.11	0.05	0.05	0.06	0.07
80	0.07	0.07	0.06	0.04	0.15	0.79	1.41	15.94	37.24	56.18	73.79	86.42	90.67	88.29	76.48	57.98	39.99	18.62	1.08	0.48	0.11	0.05	0.05	0.06	0.07
81	0.07	0.07	0.06	0.04	0.15	0.79	1.42	15.97	37.31	56.32	73.95	86.66	90.87	88.5	76.66	58.15	40.08	18.67	1.08	0.47	0.11	0.05	0.05	0.06	0.07
82	0.07	0.07	0.06	0.04	0.14	0.79	1.42	16	37.37	56.41	74.03	86.87	91.06	88.66	76.85	58.29	40.17	18.7	1.07	0.47	0.1	0.04	0.05	0.06	0.07
83	0.07	0.07	0.06	0.05	0.14	0.79	1.43	16.02	37.41	56.48	74.1	87.06	91.21	88.81	77	58.41	40.24	18.73	1.06	0.47	0.1	0.04	0.05	0.06	0.07
84	0.08	0.07	0.06	0.05	0.14	0.79	1.43	16.04	37.45	56.53	74.16	87.19	91.33	88.94	77.04	58.55	40.3	18.75	1.06	0.46	0.09	0.04	0.05	0.06	0.08
85	0.08	0.07	0.06	0.05	0.14	0.79	1.44	16.05	37.46	56.56	74.15	87.3	91.42	89.03	77.14	58.65	40.32	18.77	1.05	0.46	0.09	0.04	0.05	0.06	0.08
86	0.08	0.07	0.06	0.05	0.14	0.79	1.44	16.05	37.48	56.57	74.14	87.39	91.49	89.05	77.15	58.73	40.35	18.78	1.04	0.46	0.09	0.04	0.05	0.06	0.08
87	0.08	0.07	0.06	0.05	0.13	0.79	1.44	16.05	37.47	56.57	74.08	87.44	91.54	89.1	77.17	58.83	40.38	18.77	1.04	0.45	0.09	0.04	0.05	0.06	0.08
88	0.08	0.07	0.06	0.05	0.13	0.79	1.45	16.04	37.46	56.54	74	87.49	91.55	89.1	77.14	58.87	40.36	18.77	1.03	0.45	0.09	0.04	0.05	0.06	0.08
89	0.08	0.07	0.06	0.05	0.13	0.79	1.45	16.02	37.43	56.49	73.87	87.5	91.54	89.04	77.05	58.92	40.37	18.76	1.02	0.45	0.08	0.04	0.05	0.06	0.08
90	0.08	0.07	0.06	0.05	0.13	0.79	1.45	16	37.4	56.43	73.72	87.46	91.53	88.98	76.98	58.95	40.37	18.74	1.01	0.45	0.08	0.04	0.05	0.06	0.08
91	0.08	0.07	0.06	0.05	0.13	0.79	1.45	15.98	37.34	56.35	73.52	87.39	91.53	88.86	76.86	58.97	40.33	18.71	1	0.45	0.08	0.04	0.05	0.06	0.08
92	0.08	0.07	0.06	0.05	0.13	0.79	1.45	15.94	37.3	56.26	73.32	87.25	91.47	88.75	76.73	58.94	40.28	18.68	0.99	0.44	0.08	0.04	0.05	0.06	0.08
93	0.08	0.07	0.06	0.05	0.13	0.79	1.46	15.9	37.24	56.15	73.05	87.06	91.4	88.56	76.56	58.92	40.21	18.64	0.99	0.44	0.08	0.04	0.05	0.06	0.08
94	0.08	0.07	0.06	0.05	0.13	0.8	1.45	15.86	37.15	56.01	72.77	86.82	91.31	88.36	76.36	58.84	40.16	18.59	0.98	0.44	0.08	0.04	0.05	0.06	0.08
95	0.08	0.07	0.06	0.05	0.13	0.8	1.45	15.81	37.06	55.86	72.46	86.49	91.17	88.14	76.15	58.75	40.07	18.54	0.97	0.44	0.08	0.04	0.05	0.06	0.08
96	0.08	0.07	0.06	0.05	0.13	0.8	1.45	15.75	36.97	55.71	72.13	86.11	91	87.85	75.91	58.65	39.98	18.47	0.96	0.44	0.08	0.04	0.05	0.06	0.08
97	0.08	0.07	0.06	0.05	0.14	0.8	1.45	15.69	36.87	55.53	71.78	85.76	90.82	87.58	75.66	58.53	39.88	18.4	0.95	0.44	0.08	0.05	0.05	0.06	0.08
98	0.08	0.07	0.06	0.05	0.14	0.8	1.45	15.62	36.75	55.31	71.41	85.33	90.56	87.25	75.4	58.35	39.76	18.33	0.94	0.44	0.08	0.05	0.05	0.07	0.08
99	0.08	0.07	0.06	0.05	0.14	0.8	1.45	15.54	36.62	55.06	71.01	84.9	90.31	86.92	75.06	58.18	39.63	18.24	0.93	0.44	0.08	0.05	0.06	0.07	0.0



104	0.08	0.07	0.06	0.05	0.16	0.8	1.43	15.08	35.81	53.62	68.76	82.1	88.24	84.66	73.18	56.98	38.8	17.73	0.88	0.44	0.08	0.05	0.06	0.07	0.08
105	0.08	0.07	0.06	0.05	0.16	0.8	1.43	14.98	35.61	53.29	68.31	81.41	87.68	84.15	72.78	56.68	38.6	17.6	0.87	0.44	0.09	0.05	0.06	0.07	0.08
106	0.08	0.07	0.06	0.05	0.16	0.81	1.42	14.86	35.38	52.89	67.85	80.73	87.08	83.55	72.31	56.4	38.38	17.47	0.86	0.44	0.09	0.05	0.06	0.07	0.08
107	0.08	0.07	0.06	0.05	0.17	0.81	1.42	14.74	35.15	52.52	67.43	80.02	86.44	82.99	71.83	56.07	38.15	17.33	0.85	0.44	0.09	0.05	0.06	0.07	0.08
108	0.08	0.07	0.06	0.05	0.17	0.81	1.41	14.62	34.89	52.13	67	79.27	85.75	82.32	71.33	55.74	37.91	17.19	0.84	0.44	0.09	0.06	0.06	0.07	0.08
109	0.07	0.07	0.06	0.05	0.18	0.81	1.4	14.48	34.63	51.74	66.57	78.44	84.96	81.66	70.8	55.38	37.67	17.05	0.83	0.44	0.09	0.06	0.06	0.07	0.07
110	0.07	0.07	0.06	0.05	0.18	0.81	1.4	14.35	34.33	51.34	66.11	77.65	84.16	80.88	70.23	55.01	37.4	16.89	0.82	0.44	0.09	0.06	0.06	0.07	0.07
111	0.07	0.07	0.06	0.04	0.19	0.81	1.39	14.2	34.02	50.93	65.57	76.76	83.28	80.08	69.64	54.63	37.11	16.72	0.81	0.44	0.1	0.06	0.06	0.07	0.07
112	0.07	0.06	0.05	0.04	0.19	0.81	1.39	14.05	33.73	50.49	64.98	75.95	82.39	79.25	69.06	54.23	36.82	16.56	0.8	0.44	0.1	0.06	0.06	0.07	0.07
113	0.07	0.06	0.05	0.04	0.2	0.81	1.39	13.88	33.4	50.06	64.4	75.02	81.39	78.39	68.45	53.82	36.52	16.38	0.79	0.44	0.1	0.06	0.06	0.07	0.07
114	0.07	0.06	0.05	0.04	0.21	0.82	1.38	13.72	33.09	49.6	63.77	74.12	80.42	77.52	67.79	53.38	36.21	16.2	0.78	0.44	0.11	0.06	0.06	0.07	0.07
115	0.06	0.06	0.05	0.04	0.21	0.82	1.37	13.54	32.74	49.14	63.16	73.23	79.41	76.57	67.14	52.94	35.87	16.01	0.77	0.44	0.11	0.06	0.06	0.07	0.06
116	0.06	0.06	0.05	0.04	0.22	0.82	1.37	13.36	32.37	48.66	62.5	72.3	78.34	75.65	66.49	52.46	35.53	15.81	0.76	0.44	0.11	0.06	0.06	0.07	0.06
117	0.06	0.06	0.05	0.04	0.23	0.82	1.36	13.2	32.02	48.19	61.86	71.4	77.24	74.66	65.76	51.97	35.18	15.62	0.75	0.44	0.12	0.06	0.06	0.07	0.06
118	0.06	0.06	0.05	0.04	0.24	0.83	1.36	13	31.63	47.66	61.14	70.51	76.16	73.69	65.01	51.45	34.81	15.41	0.74	0.44	0.12	0.05	0.06	0.07	0.06
119	0.06	0.06	0.05	0.05	0.25	0.83	1.35	12.83	31.26	47.14	60.39	69.63	75.05	72.63	64.25	50.95	34.44	15.2	0.73	0.44	0.13	0.05	0.06	0.07	0.06
120	0.06	0.06	0.05	0.05	0.26	0.83	1.34	12.63	30.85	46.63	59.62	68.69	73.92	71.59	63.48	50.42	34.04	14.98	0.72	0.44	0.13	0.05	0.06	0.07	0.06
121	0.06	0.06	0.05	0.05	0.27	0.84	1.34	12.42	30.47	46.06	58.84	67.8	72.75	70.53	62.62	49.89	33.62	14.75	0.71	0.44	0.13	0.05	0.06	0.07	0.06
122	0.06	0.06	0.05	0.05	0.28	0.84	1.33	12.23	30.04	45.52	58.01	66.91	71.6	69.45	61.69	49.3	33.2	14.53	0.7	0.44	0.14	0.05	0.06	0.07	0.06
123	0.06	0.05	0.05	0.05	0.29	0.84	1.32	12.02	29.62	44.96	57.17	65.98	70.44	68.32	60.74	48.71	32.75	14.3	0.69	0.44	0.14	0.05	0.06	0.07	0.06
124	0.06	0.05	0.05	0.05	0.3	0.85	1.32	11.81	29.2	44.4	56.32	64.99	69.3	67.23	59.81	48.13	32.32	14.06	0.68	0.44	0.15	0.05	0.06	0.07	0.06
125	0.06	0.05	0.05	0.05	0.31	0.85	1.31	11.6	28.76	43.74	55.44	64.02	68.11	66.07	58.84	47.51	31.86	13.81	0.67	0.44	0.15	0.05	0.06	0.07	0.06
126	0.06	0.05	0.05	0.05	0.32	0.85	1.3	11.38	28.32	43.09	54.56	62.99	66.91	64.93	57.93	46.9	31.37	13.56	0.66	0.44	0.16	0.05	0.06	0.07	0.06
127	0.05	0.05	0.05	0.05	0.33	0.86	1.3	11.16	27.86	42.44	53.64	61.92	65.72	63.77	57.03	46.25	30.89	13.3	0.65	0.44	0.17	0.05	0.06	0.07	0.05
128	0.05	0.05	0.04	0.05	0.35	0.86	1.29	10.94	27.39	41.76	52.75	60.86	64.52	62.61	56.14	45.58	30.39	13.04	0.65	0.44	0.17	0.05	0.06	0.07	0.05
129	0.05	0.05	0.04	0.05	0.36	0.87	1.28	10.72	26.92	41.05	51.87	59.73	63.3	61.42	55.22	44.85	29.87	12.78	0.64	0.44	0.18	0.05	0.06	0.07	0.05
130	0.05	0.05	0.04	0.05	0.37	0.87	1.27	10.48	26.42	40.37	50.95	58.64	62.09	60.26	54.28	44.12	29.36	12.51	0.63	0.44	0.18	0.05	0.06	0.06	0.05
131	0.05	0.05	0.04	0.05	0.39	0.88	1.27	10.26	25.92	39.66	50.08	57.5	60.86	59.09	53.31	43.33	28.82	12.23	0.62	0.44	0.19	0.05	0.06	0.06	0.05
132	0.05	0.05	0.04	0.07	0.4	0.89	1.27	10.04	25.39	38.93	49.19	56.35	59.64	57.92	52.29	42.5	28.27	11.95	0.61	0.44	0.2	0.06	0.06	0.06	0.05
133	0.05	0.04	0.04	0.08	0.42	0.91	1.27	9.8	24.85	38.19	48.26	55.2	58.38	56.75	51.3	41.66	27.72	11.67	0.6	0.44	0.2	0.06	0.06	0.06	0.05
134	0.05	0.04	0.04	0.09	0.43	0.92	1.27	9.57	24.32	37.45	47.35	54.06	57.17	55.62	50.3	40.82	27.15	11.38	0.6	0.44	0.21	0.06	0.06	0.06	0.05
135	0.05	0.04	0.04	0.1	0.45	0.93	1.28	9.33	23.79	36.69	46.42	52.91	55.91	54.43	49.26	39.93	26.56	11.09	0.59	0.45	0.22	0.07	0.06	0.06	0.05
136	0.04	0.04	0.04	0.12	0.47	0.95	1.28	9.1	23.23	35.91	45.5	51.81	54.67	53.32	48.21	39.06	25.93	10.79	0.59	0.45	0.23	0.07	0.06	0.06	0.04
137	0.04	0.04	0.04	0.13	0.48	0.96	1.29	8.85	22.67	35.12	44.55	50.65	53.44	52.17	47.18	38.17	25.3	10.5	0.59	0.45	0.24	0.08	0.06	0.06	0.04
138	0.04	0.04	0.04	0.15	0.5	0.97	1.29	8.61	22.11	34.33	43.58	49.58	52.24	51.04	46.14	37.28	24.65	10.21	0.59	0.46	0.25	0.09	0.06	0.06	0.04
139	0.04	0.04	0.04	0.17	0.52	0.98	1.3	8.36	21.53	33.55	42.63	48.45	51.02	49.87	45.08	36.35	24	9.92	0.59	0.47	0.27	0.11	0.06	0.06	0.04
140	0.04	0.04	0.04	0.19	0.54	0.99	1.3	8.12	20.96	32.73	41.64	47.37	49.85	48.73	44	35.45	23.36	9.63	0.59	0.48	0.28	0.12	0.06	0.06	0.04
141	0.04	0.04	0.04	0.22	0.56	1	1.31	7.86	20.36	31.9	40.65	46.27	48.68	47.58	42.92	34.53	22.72	9.34	0.6	0.5	0.3	0.13	0.06	0.05	0.04
142	0.04	0.04	0.04	0.24	0.58	1.02	1.31	7.62	19.77	31.05	39.63	45.16	47.51	46.41	41.84	33.58	22.07	9.08	0.61	0.51	0.32	0.15	0.06	0.05	0.04
143	0.04	0.04	0.04	0.26	0.6	1.03	1.31	7.36	19.17	30.2	38.63	44.05	46.32	45.24	40.75	32.69	21.45	8.84	0.63	0.53	0.33	0.16	0.06	0.05	0.04
144	0.04	0.03	0.04	0.28	0.62	1.04	1.31	7.11	18.57	29.34	37.58	42.88	45.13	44.05	39.64	31.77	20.84	8.59	0.65	0.55	0.35	0.18	0.06	0.05	0.04
145	0.04	0.03	0.05	0.31	0.64	1.05	1.31	6.86	17.97	28.47	36.51	41.72	43.88	42.83	38.53	30.83	20.2	8.35	0.66	0.56	0.37	0.2	0.06	0.05	0.04
146	0.04	0.03	0.05	0.33	0.66	1.06	1.32	6.62	17.37	27.56	35.44	40.56	42.66	41.62	37.41	29.92	19.59	8.1	0.68	0.58	0.39	0.22	0.07	0.05	0.04
147	0.04	0.04	0.06	0.35	0.68	1.07	1.32	6.39	16.75	26.68	34.37	39.36	41.44	40.42	36.28	28.97	18.97	7.87	0.7	0.6	0.42	0.24	0.07	0.04	0.04
148	0.04	0.04	0.07	0.38	0.7	1.08	1.32	6.14	16.13	25.76	33.27	38.16	40.15	39.15	35.15	28.05	18.37	7.67	0.73	0.62	0.44	0.27	0.07	0.04	0.04
149	0.05	0.04	0.08	0.4	0.73	1.09	1.32	5.9	15.5	24.84	32.16	36.92	38.86	37.9	34.04	27.14	17.78	7.48	0.75	0.64	0.46	0.29	0.08	0.04	0.05
150	0.07	0.03	0.08	0.42	0.75	1.1	1.32	5.65	14.87	23.94	31.06	35.7	37.56	36.65	32.91	26.24	17.24	7.32	0.79	0.67	0.49	0.32	0.08	0.04	0.07
151	0.09	0.03	0.09	0.45	0.77	1.11	1.32	5.41	14.24	22.98	29.91	34.41	36.21	35.37	31.77	25.36	16.69	7.18	0.83	0.69	0.52	0.32	0.08	0.04	0.09
152	0.12	0.03	0.09	0.47	0.79	1.12	1.32	5.17	13.62	22.05	28.76	33.13	34.88	34.12	30.66	24.47	16.18	7.05	0.88	0.71	0.54	0.26	0.09	0.04	0.12
153	0.15	0.04	0.1	0.49	0.82	1.13	1.32	4.93	13	21.1	27.55	31.84	33.53	32.81	29.52	23.59	15.65	6.94	0.94	0.74					



158	0.34	0.16	0.1	0.58	0.93	1.18	1.32	3.8	9.9	16.32	21.59	25.15	26.49	26.12	23.77	19.26	13.18	6.4	1.33	0.85	0.73	0.41	0.14	0.04	0.34
159	0.38	0.21	0.08	0.59	0.96	1.19	1.32	3.58	9.28	15.37	20.38	23.78	25.07	24.75	22.61	18.39	12.67	6.27	1.43	0.87	0.76	0.43	0.15	0.05	0.38
160	0.42	0.27	0.07	0.6	0.98	1.2	1.32	3.38	8.68	14.43	19.18	22.4	23.62	23.37	21.39	17.49	12.08	6.14	1.52	0.89	0.79	0.45	0.16	0.06	0.42
161	0.47	0.33	0.06	0.61	1	1.21	1.31	3.17	7.93	13.47	17.97	21.02	22.15	21.98	20.19	16.58	11.2	5.95	1.61	0.91	0.82	0.47	0.17	0.08	0.47
162	0.52	0.4	0.05	0.61	1.02	1.21	1.31	2.98	7.03	12.53	16.75	19.63	20.7	20.57	18.99	15.65	9.9	5.6	1.68	0.93	0.85	0.48	0.18	0.11	0.52
163	0.56	0.46	0.05	0.61	1.04	1.22	1.31	2.74	6.15	11.54	15.54	18.25	19.25	19.18	17.74	14.68	8.48	5.07	1.7	0.95	0.88	0.49	0.18	0.13	0.56
164	0.6	0.53	0.06	0.6	1.06	1.22	1.31	2.49	5.26	9.75	14.33	16.87	17.8	17.76	16.49	13.24	6.99	4.46	1.68	0.97	0.91	0.51	0.18	0.16	0.6
165	0.65	0.6	0.11	0.59	1.08	1.23	1.3	2.24	4.42	7.65	13.13	15.48	16.36	16.33	15.18	11.81	5.77	3.86	1.61	0.99	0.93	0.52	0.18	0.2	0.65
166	0.7	0.66	0.12	0.57	1.1	1.23	1.3	2.01	3.77	6.04	11.88	14.12	14.93	14.86	13.44	10.11	5.02	3.36	1.53	1.01	0.95	0.47	0.17	0.22	0.7
167	0.66	0.6	0.12	0.51	1.02	1.23	1.29	1.83	3.23	4.84	8.6	12.78	13.44	13.31	11.7	7.65	4.24	2.87	1.46	1.02	0.96	0.39	0.16	0.19	0.66
168	0.48	0.4	0.07	0.4	0.94	1.18	1.29	1.65	2.75	3.86	6.04	10.55	11.85	11.7	8.61	5.4	3.46	2.33	1.3	0.99	0.82	0.28	0.1	0.1	0.48
169	0.25	0.16	0.03	0.29	0.75	1.05	1.13	1.42	2.23	3.13	4.21	5.69	6.48	6.49	4.76	3.51	2.82	1.79	1.02	0.77	0.62	0.18	0.03	0.04	0.25
170	0.09	0.02	0.03	0.16	0.54	0.85	0.98	1.15	1.69	2.47	2.93	2.58	2.93	2.92	2.06	2.77	2.22	1.33	0.69	0.51	0.38	0.13	0.03	0.03	0.09
171	0.14	0.05	0.03	0.03	0.34	0.59	0.69	0.8	1.22	1.73	2.29	1.52	1.13	1.12	1.39	2.16	1.63	0.99	0.44	0.28	0.24	0.05	0.02	0.02	0.14
172	0.18	0.09	0.02	0.03	0.14	0.35	0.43	0.5	0.79	1.13	1.51	1.07	0.82	0.83	0.92	1.41	1.07	0.65	0.25	0.15	0.08	0.03	0.02	0.02	0.18
173	0.14	0.09	0.02	0.03	0.03	0.11	0.19	0.22	0.44	0.7	0.77	0.58	0.52	0.53	0.48	0.69	0.67	0.44	0.11	0.03	0.03	0.03	0.02	0.02	0.14
174	0.06	0.04	0.02	0.03	0.03	0.03	0.03	0.07	0.27	0.41	0.34	0.3	0.3	0.3	0.25	0.29	0.38	0.27	0.07	0.03	0.03	0.03	0.02	0.02	0.06
175	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.15	0.22	0.17	0.15	0.19	0.19	0.14	0.17	0.19	0.14	0.05	0.03	0.03	0.03	0.02	0.02	0.02
176	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.08	0.1	0.09	0.06	0.09	0.09	0.08	0.07	0.09	0.07	0.03	0.03	0.03	0.03	0.02	0.02	0.01
177	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.01
178	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.01
179	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.01
180	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	SA-MUWP	Sample ID.	D1
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
120.06	60	0.066	7.89	0.989	9.39%
277.03	60	0.034	8.47	0.903	20.99%

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*****