

## 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:

*Alan Wang*

Engineer: Alan Wang  
Date: 2023-06-14

Review by:

*Vincent Yuan*

Technical Lead: Vincent Yuan  
Issue Date: 2023-06-14  
Revised Date: N/A

## 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	N/A		6616
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		155.7
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		6388
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	150.3
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		42.5
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.63
			277V	12.58
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.992
			277V	0.848
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5060
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		74.7
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-27
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		76
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		94
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-17%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		7.0%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		277.0
(Goniophotometer – Section 4.2)		Non-Worst Case		120.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.181
(Goniophotometer – Section 4.2)		Non-Worst Case		0.356
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		42.5
(Goniophotometer – Section 4.2)		Non-Worst Case		42.4

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34M @ 40W / 5000K	230612002-S1
2	Goniophotometer Test	2023-06-13	W34M @ 40W / 5000K	230612002-S1
3	THD and PF Test	2023-06-13	W34M @ 40W / 5000K	230612002-S1

### Remark (If any)

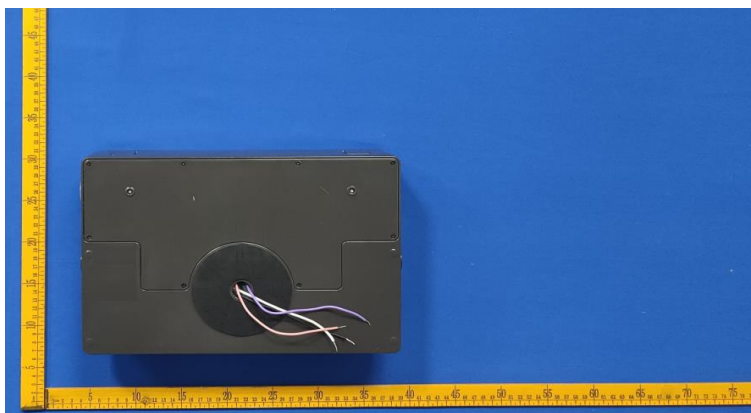
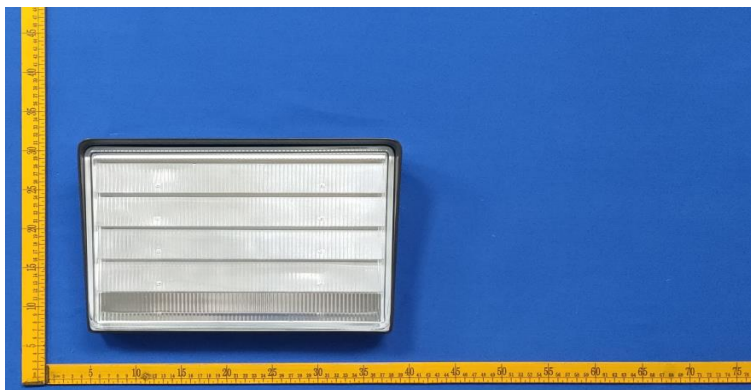
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

## 3.0 Product Description

Luminaire Description: Model No. W34M @ 40W / 5000K, color tunable from 3000K, 4000K and 5000K.

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

### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

<b>Model No.</b>	W34M @ 40W / 5000K	<b>Sample ID</b>	230612002-S1
<b>Operate time (Min.)</b>	10	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

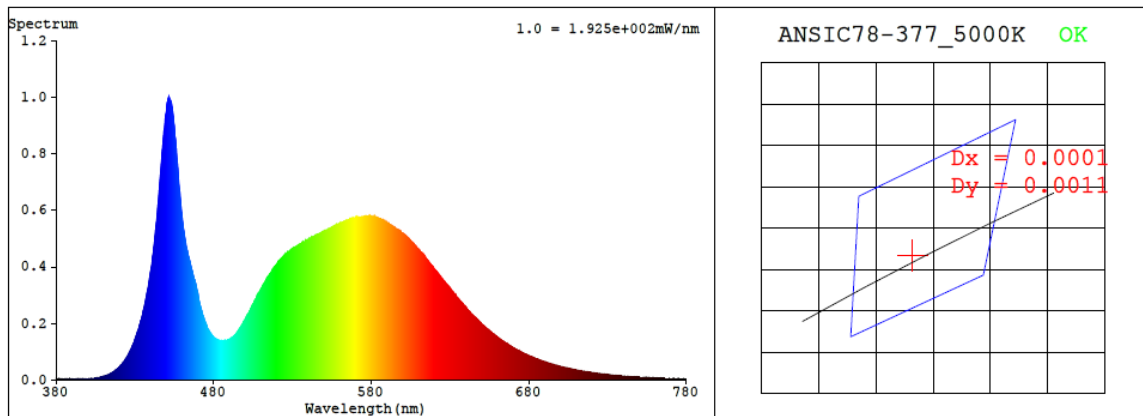
<b>Test Method</b>
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</p> <p>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.</p> <p>The sample was measured using 4<math>\pi</math> 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.</p>

#### Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.356	42.4	0.992
277.0	60	0.181	42.5	0.848

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5060	74.7	-27	0.0005	76	94	-17%

#### 4.1 Integrating Sphere Test



#### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3435$   $y = 0.3514$  /  $u' = 0.2104$   $v' = 0.4844$  ( $duv=5.48e-04$ )

CCT= 5060K Prcp WL: Ld=571.3nm Purity=8.5%

Peak WL: Lp=452nm FWHM: =19.3nm Ratio:R=14.5% G=81.8% B=3.7%

Render Index: Ra = 74.7 AvgR = 65.0 TM30:Rf=76 Rg=93

EEL: 0.08970 A++ Highest

R1 =72 R2 =81 R3 =87 R4 =74 R5 =73 R6 =73 R7 =82

R8 =56 R9 =-27 R10=54 R11=70 R12=47 R13=74 R14=93 R15=67

## 4.1 Integrating Sphere Test

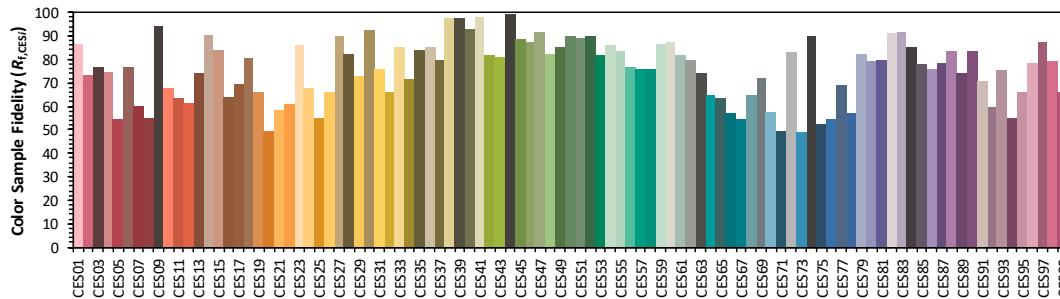
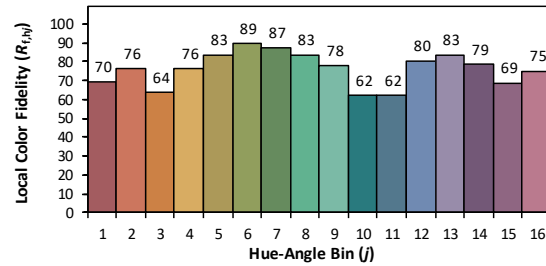
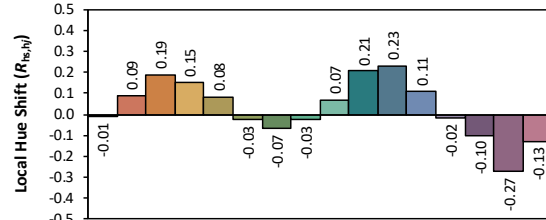
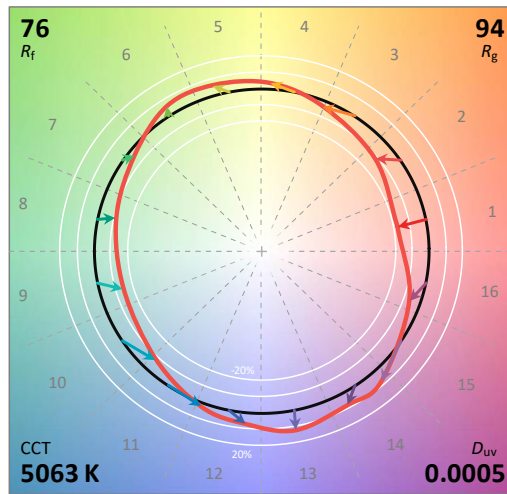
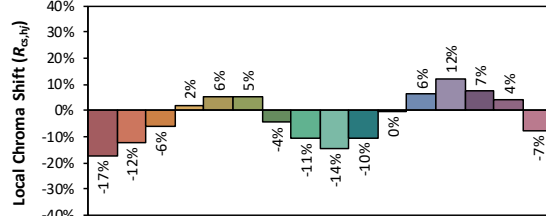
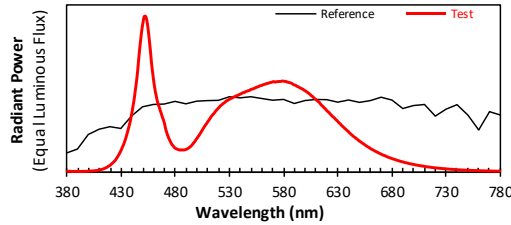
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34M @ 40W / 5000K



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

$x$  0.3434  
 $y$  0.3512  
 $u'$  0.2104  
 $v'$  0.4843

CIE 13.3-1995  
(CRI)

$R_a$  75  
 $R_g$  -27

## 4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	3.90E-06	447	7.88E-04	514	3.61E-04	581	5.78E-04	648	2.10E-04	715	3.07E-05
381	3.00E-06	448	8.51E-04	515	3.68E-04	582	5.78E-04	649	2.04E-04	716	2.96E-05
382	4.70E-06	449	9.10E-04	516	3.77E-04	583	5.75E-04	650	1.98E-04	717	2.88E-05
383	3.80E-06	450	9.53E-04	517	3.86E-04	584	5.73E-04	651	1.94E-04	718	2.76E-05
384	3.20E-06	451	9.90E-04	518	3.95E-04	585	5.71E-04	652	1.89E-04	719	2.71E-05
385	2.40E-06	452	9.95E-04	519	4.02E-04	586	5.69E-04	653	1.84E-04	720	2.61E-05
386	3.10E-06	453	9.84E-04	520	4.09E-04	587	5.67E-04	654	1.79E-04	721	2.55E-05
387	3.20E-06	454	9.50E-04	521	4.17E-04	588	5.64E-04	655	1.75E-04	722	2.46E-05
388	2.90E-06	455	8.97E-04	522	4.24E-04	589	5.59E-04	656	1.69E-04	723	2.40E-05
389	3.10E-06	456	8.34E-04	523	4.29E-04	590	5.55E-04	657	1.65E-04	724	2.33E-05
390	3.10E-06	457	7.64E-04	524	4.36E-04	591	5.54E-04	658	1.60E-04	725	2.28E-05
391	2.90E-06	458	6.89E-04	525	4.40E-04	592	5.49E-04	659	1.56E-04	726	2.20E-05
392	2.80E-06	459	6.32E-04	526	4.46E-04	593	5.45E-04	660	1.52E-04	727	2.12E-05
393	2.90E-06	460	5.77E-04	527	4.53E-04	594	5.42E-04	661	1.47E-04	728	2.07E-05
394	3.40E-06	461	5.31E-04	528	4.55E-04	595	5.38E-04	662	1.43E-04	729	2.01E-05
395	3.20E-06	462	4.94E-04	529	4.61E-04	596	5.34E-04	663	1.40E-04	730	1.95E-05
396	3.80E-06	463	4.61E-04	530	4.64E-04	597	5.31E-04	664	1.36E-04	731	1.89E-05
397	3.50E-06	464	4.33E-04	531	4.68E-04	598	5.27E-04	665	1.32E-04	732	1.82E-05
398	4.00E-06	465	4.15E-04	532	4.71E-04	599	5.22E-04	666	1.29E-04	733	1.77E-05
399	4.50E-06	466	3.91E-04	533	4.74E-04	600	5.19E-04	667	1.25E-04	734	1.72E-05
400	4.30E-06	467	3.72E-04	534	4.78E-04	601	5.14E-04	668	1.22E-04	735	1.68E-05
401	5.20E-06	468	3.49E-04	535	4.80E-04	602	5.09E-04	669	1.18E-04	736	1.64E-05
402	5.70E-06	469	3.30E-04	536	4.85E-04	603	5.04E-04	670	1.15E-04	737	1.58E-05
403	6.00E-06	470	3.06E-04	537	4.86E-04	604	4.99E-04	671	1.11E-04	738	1.52E-05
404	6.50E-06	471	2.75E-04	538	4.90E-04	605	4.92E-04	672	1.08E-04	739	1.48E-05
405	6.90E-06	472	2.51E-04	539	4.94E-04	606	4.86E-04	673	1.05E-04	740	1.43E-05
406	8.00E-06	473	2.31E-04	540	4.97E-04	607	4.81E-04	674	1.03E-04	741	1.37E-05
407	8.10E-06	474	2.13E-04	541	5.00E-04	608	4.74E-04	675	9.94E-05	742	1.34E-05
408	9.80E-06	475	1.99E-04	542	5.05E-04	609	4.68E-04	676	9.66E-05	743	1.30E-05
409	1.10E-05	476	1.84E-04	543	5.06E-04	610	4.62E-04	677	9.34E-05	744	1.26E-05
410	1.28E-05	477	1.74E-04	544	5.08E-04	611	4.56E-04	678	9.08E-05	745	1.23E-05
411	1.45E-05	478	1.65E-04	545	5.12E-04	612	4.50E-04	679	8.86E-05	746	1.20E-05
412	1.61E-05	479	1.56E-04	546	5.15E-04	613	4.45E-04	680	8.59E-05	747	1.16E-05
413	1.84E-05	480	1.50E-04	547	5.18E-04	614	4.36E-04	681	8.36E-05	748	1.12E-05
414	2.09E-05	481	1.47E-04	548	5.19E-04	615	4.27E-04	682	8.15E-05	749	1.09E-05
415	2.42E-05	482	1.44E-04	549	5.23E-04	616	4.21E-04	683	7.93E-05	750	1.07E-05
416	2.72E-05	483	1.41E-04	550	5.27E-04	617	4.14E-04	684	7.65E-05	751	1.03E-05
417	3.10E-05	484	1.40E-04	551	5.29E-04	618	4.07E-04	685	7.46E-05	752	1.02E-05
418	3.60E-05	485	1.40E-04	552	5.30E-04	619	4.01E-04	686	7.24E-05	753	9.90E-06
419	3.98E-05	486	1.40E-04	553	5.34E-04	620	3.92E-04	687	7.03E-05	754	9.30E-06
420	4.47E-05	487	1.40E-04	554	5.36E-04	621	3.86E-04	688	6.78E-05	755	9.00E-06
421	5.14E-05	488	1.40E-04	555	5.41E-04	622	3.80E-04	689	6.63E-05	756	9.00E-06
422	5.74E-05	489	1.42E-04	556	5.43E-04	623	3.72E-04	690	6.45E-05	757	8.70E-06
423	6.39E-05	490	1.44E-04	557	5.45E-04	624	3.64E-04	691	6.26E-05	758	8.30E-06
424	7.11E-05	491	1.47E-04	558	5.49E-04	625	3.57E-04	692	6.04E-05	759	8.00E-06
425	8.04E-05	492	1.52E-04	559	5.51E-04	626	3.51E-04	693	5.88E-05	760	7.90E-06
426	9.12E-05	493	1.56E-04	560	5.53E-04	627	3.45E-04	694	5.78E-05	761	7.60E-06
427	1.02E-04	494	1.62E-04	561	5.56E-04	628	3.37E-04	695	5.57E-05	762	7.30E-06
428	1.14E-04	495	1.69E-04	562	5.58E-04	629	3.31E-04	696	5.37E-05	763	7.20E-06
429	1.27E-04	496	1.77E-04	563	5.60E-04	630	3.24E-04	697	5.21E-05	764	7.10E-06
430	1.41E-04	497	1.86E-04	564	5.63E-04	631	3.16E-04	698	5.11E-05	765	6.80E-06
431	1.59E-04	498	1.94E-04	565	5.65E-04	632	3.10E-04	699	4.91E-05	766	6.50E-06
432	1.73E-04	499	2.06E-04	566	5.66E-04	633	3.03E-04	700	4.82E-05	767	6.50E-06
433	1.93E-04	500	2.14E-04	567	5.70E-04	634	2.95E-04	701	4.65E-05	768	6.40E-06
434	2.13E-04	501	2.26E-04	568	5.71E-04	635	2.89E-04	702	4.48E-05	769	6.10E-06
435	2.38E-04	502	2.34E-04	569	5.72E-04	636	2.83E-04	703	4.39E-05	770	5.90E-06
436	2.62E-04	503	2.46E-04	570	5.75E-04	637	2.76E-04	704	4.27E-05	771	5.70E-06
437	2.89E-04	504	2.57E-04	571	5.77E-04	638	2.70E-04	705	4.12E-05	772	5.50E-06
438	3.16E-04	505	2.68E-04	572	5.74E-04	639	2.63E-04	706	4.01E-05	773	5.40E-06
439	3.51E-04	506	2.80E-04	573	5.75E-04	640	2.58E-04	707	3.89E-05	774	5.30E-06
440	3.87E-04	507	2.91E-04	574	5.76E-04	641	2.50E-04	708	3.77E-05	775	5.10E-06
441	4.30E-04	508	3.01E-04	575	5.76E-04	642	2.43E-04	709	3.68E-05	776	4.90E-06
442	4.71E-04	509	3.10E-04	576	5.78E-04	643	2.37E-04	710	3.57E-05	777	4.70E-06
443	5.26E-04	510	3.21E-04	577	5.78E-04	644	2.31E-04	711	3.42E-05	778	4.70E-06
444	5.78E-04	511	3.31E-04	578	5.78E-04	645	2.25E-04	712	3.32E-05	779	4.60E-06
445	6.40E-04	512	3.41E-04	579	5.81E-04	646	2.21E-04	713	3.23E-05	780	4.60E-06
446	7.17E-04	513	3.52E-04	580	5.79E-04	647	2.15E-04	714	3.15E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	W34M @ 40W / 5000K	<b>Sample ID</b>	230612002-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.0	<b>Humidity (%RH)</b>	42.1

<b>Test Method</b>
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at <math>25 \pm 1^\circ\text{C}</math>, measured at a point not more than 1 m from the sample and at the same height as the sample.</p> <p>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 <math>\pm 0.2</math> percent under load.</p> <p>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 <math>1.0^\circ</math> vertical intervals and <math>15^\circ</math> horizontal intervals.</p>

### Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
<b>WORST CASE</b>	277.0	60	0.181	42.5	0.848
<b>NON-WORST CASE</b>	120.0	60	0.356	42.4	0.992

### Test Result

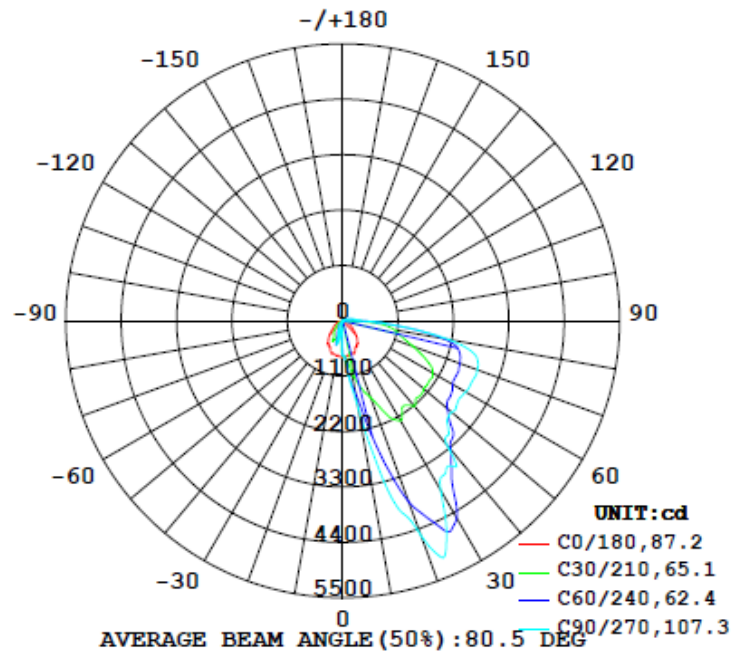
Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement (80°-90°)	BUG
		C0-180	C90-270	C0-180	C90-270			
<b>0°-180° zones</b>	6616	90.8	123.9	63.9	61.4	155.7	6.8%	B1-U3-G3
<b>0°-90° zones</b>	6388	90.8	123.9	63.9	61.4	150.3	7.0%	B1-U3-G3



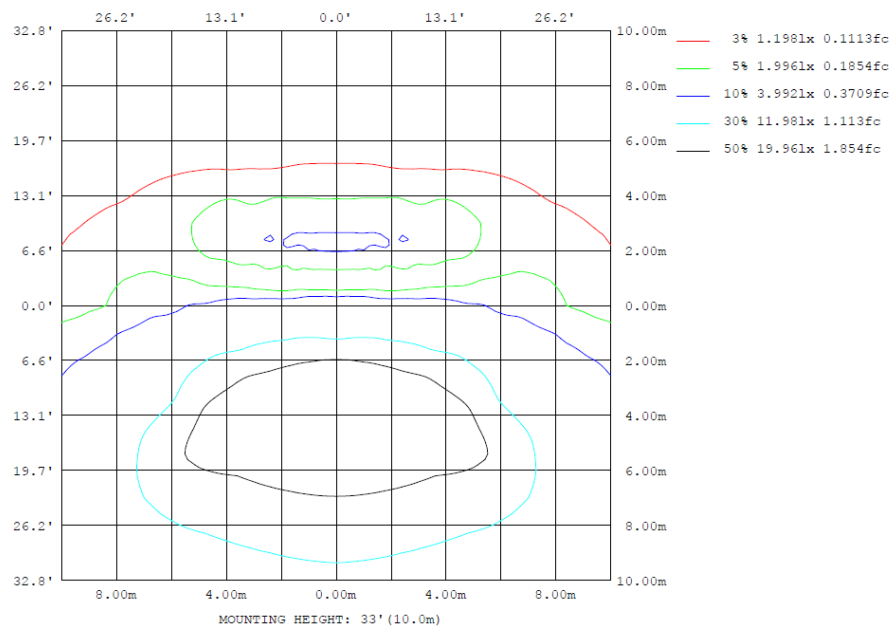
## 4.2 Goniophotometer Test

### Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

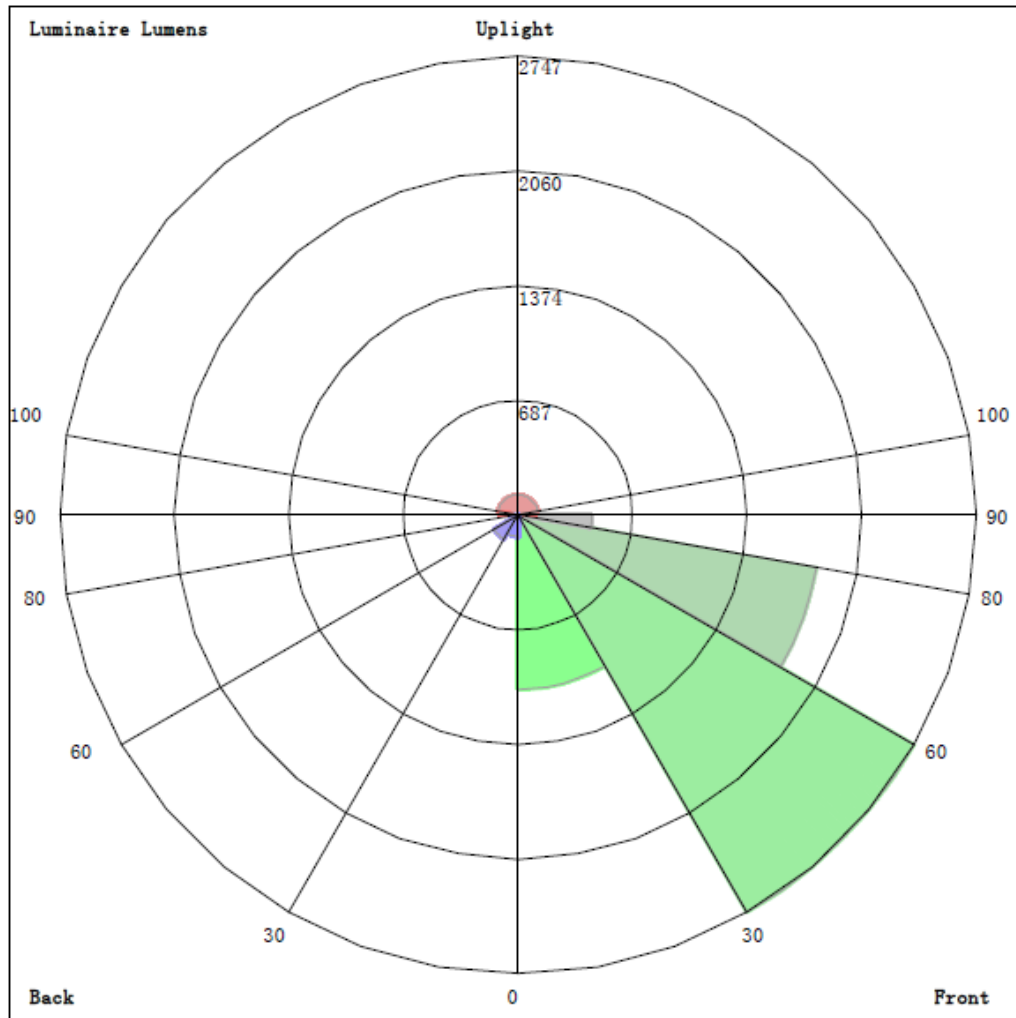
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	707.0	1309	1737	1309	707.0	172.7	330.8	172.7	0- 10	59.95	59.95	0.91, 0.91
20	684.1	2598	4516	2598	684.1	477.8	245.4	477.8	10- 20	338.3	398.3	6.02, 6.02
30	543.7	3873	3899	3873	543.7	275.8	126.2	275.8	20- 30	772.7	1171	17.7, 17.7
40	444.2	3909	3215	3909	444.2	155.0	45.67	155.0	30- 40	959.1	2130	32.2, 32.2
50	278.2	2866	2819	2866	278.2	64.17	8.523	64.17	40- 50	988.8	3119	47.1, 47.1
60	181.9	2252	2821	2252	181.9	26.85	2.033	26.85	50- 60	966.1	4085	61.7, 61.7
70	114.1	2098	2846	2098	114.1	14.84	0.5843	14.84	60- 70	964.3	5049	76.3, 76.3
80	42.19	1884	2131	1884	42.19	11.14	1.409	11.14	70- 80	890.1	5939	89.8, 89.8
90	12.65	401.0	432.5	401.0	12.65	7.567	2.212	7.567	80- 90	448.9	6388	96.6, 96.6
100	8.704	142.6	219.6	142.6	8.704	4.176	2.658	4.176	90-100	105.9	6494	98.2, 98.2
110	6.712	68.40	99.00	68.40	6.712	3.807	2.754	3.807	100-110	50.00	6544	98.9, 98.9
120	5.131	56.22	70.65	56.22	5.131	3.572	2.709	3.572	110-120	28.22	6572	99.3, 99.3
130	4.015	39.49	57.61	39.49	4.015	3.410	3.026	3.410	120-130	19.74	6592	99.6, 99.6
140	3.115	22.43	48.13	22.43	3.115	3.031	3.100	3.031	130-140	13.78	6606	99.8, 99.8
150	2.399	12.47	22.85	12.47	2.399	2.632	2.801	2.632	140-150	6.350	6612	99.9, 99.9
160	1.818	6.010	10.20	6.010	1.818	2.421	2.063	2.421	150-160	2.760	6615	100, 100
170	1.439	1.074	1.183	1.074	1.439	1.771	1.231	1.771	160-170	0.7818	6616	100, 100
180	1.641	1.483	1.352	1.483	1.641	1.574	1.326	1.574	170-180	0.1319	6616	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	59.95	0-10	59.95	0.91%
10-20	338.32	0-20	398.27	6.02%
20-30	772.67	0-30	1170.94	17.70%
30-40	959.06	0-40	2130.00	32.20%
40-50	988.79	0-50	3118.79	47.14%
50-60	966.06	0-60	4084.85	61.74%
60-70	964.32	0-70	5049.17	76.32%
70-80	890.12	0-80	5939.29	89.78%
80-90	448.86	0-90	6388.15	96.56%
90-100	105.92	0-100	6494.07	98.16%
100-110	50.00	0-110	6544.07	98.92%
110-120	28.22	0-120	6572.29	99.34%
120-130	19.74	0-130	6592.03	99.64%
130-140	13.78	0-140	6605.81	99.85%
140-150	6.35	0-150	6612.16	99.95%
150-160	2.76	0-160	6614.92	99.99%
160-170	0.78	0-170	6615.70	100.00%
170-180	0.13	0-180	6615.83	100.00%

## 4.2 Goniophotometer Test

LCS/BUG

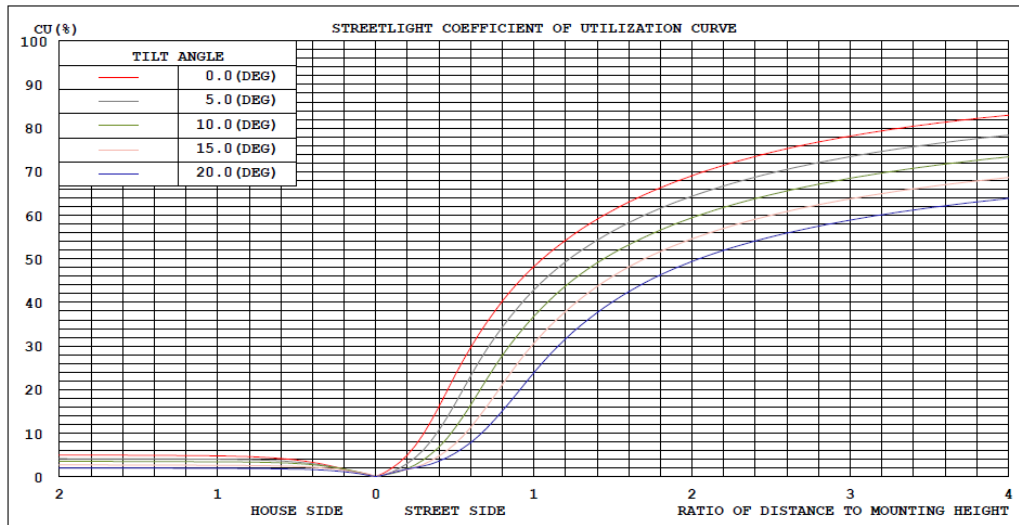


### LUMINAIRE CLASSIFICATION SYSTEM (LCS)

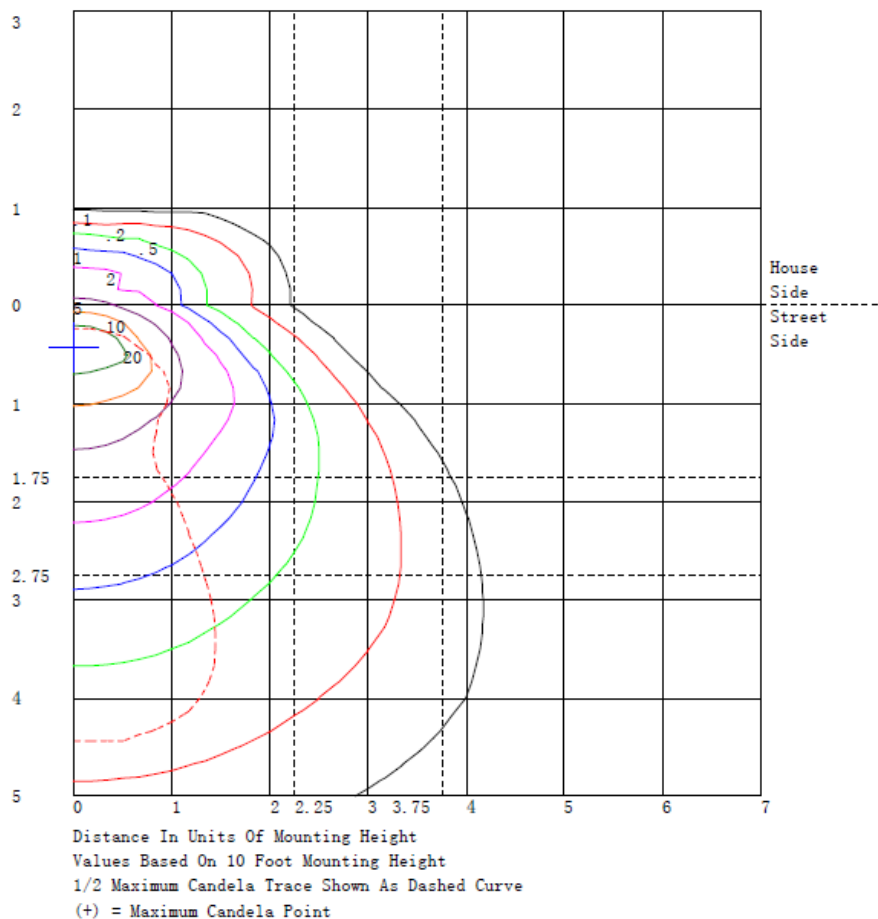
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1044.0	N.A.	15.8
FM - Front-Medium (30-60)	2747.2	N.A.	41.5
FH - Front-High (60-80)	1818.5	N.A.	27.5
FVH - Front-Very High (80-90)	442.3	N.A.	6.7
BL - Back-Low (0-30)	126.9	N.A.	1.9
BM - Back-Medium (30-60)	166.7	N.A.	2.5
BH - Back-High (60-80)	36.0	N.A.	0.5
BVH - Back-Very High (80-90)	6.5	N.A.	0.1
UL - Uplight-Low (90-100)	105.9	N.A.	1.6
UH - Uplight-High (100-180)	121.8	N.A.	1.8
<b>Total</b>	<b>6615.8</b>	<b>N.A.</b>	<b>100.0</b>
<b>BUG Rating</b>	<b>B1-U3-G3</b>		

## 4.2 Goniophotometer Test

### Coefficients of Utilization



### Isolines



## 4.2 Goniophotometer Test

### Luminous Distribution Intensity Data

Table--1 UNIT: cd

C (DEG) y	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	696	696	696	697	697	697	697	697	698	698	698	698	698	698	698	698	699	700	700
5	712	700	695	695	703	716	735	762	792	821	846	869	890	910	927	941	954	963	969
10	707	698	715	760	844	945	1053	1145	1232	1309	1365	1415	1464	1527	1589	1645	1689	1721	1737
15	690	736	808	906	1045	1199	1359	1476	1604	1760	2005	2276	2553	2807	3037	3232	3369	3459	3499
20	684	839	994	1150	1282	1434	1623	1904	2232	2598	3027	3447	3822	4044	4200	4308	4415	4486	4516
25	582	790	1011	1247	1479	1738	2039	2445	2883	3330	3758	4150	4484	4701	4847	4929	4934	4906	4869
30	544	720	942	1210	1520	1880	2292	2835	3379	3873	4201	4420	4524	4436	4276	4093	3997	3931	3899
35	522	743	979	1231	1448	1717	2078	2786	3494	4075	4108	3977	3771	3702	3648	3609	3593	3588	3588
40	444	681	941	1224	1504	1827	2209	2844	3447	3909	3825	3598	3336	3345	3392	3439	3363	3278	3215
45	361	654	948	1243	1527	1821	2135	2575	2984	3301	3314	3229	3101	3055	3019	2991	2967	2953	2949
50	278	531	805	1098	1433	1773	2102	2417	2680	2866	2859	2791	2707	2717	2743	2776	2796	2810	2819
55	225	391	616	898	1305	1721	2097	2289	2411	2484	2544	2583	2613	2656	2697	2734	2762	2783	2794
60	182	305	505	779	1217	1665	2058	2186	2236	2252	2341	2433	2523	2597	2663	2719	2768	2803	2821
65	146	235	402	645	1042	1458	1836	1997	2094	2161	2279	2394	2505	2608	2698	2771	2812	2833	2837
70	114	166	289	483	798	1146	1488	1727	1929	2098	2241	2365	2474	2592	2696	2779	2824	2845	2846
75	75.0	107	202	359	606	895	1205	1513	1802	2054	2204	2314	2401	2512	2610	2689	2729	2747	2746
80	42.2	67.7	150	289	506	763	1046	1355	1644	1884	1975	2013	2022	2061	2094	2119	2130	2133	2131
85	24.7	52.0	117	219	385	569	752	903	1024	1107	1104	1072	1031	1031	1038	1047	1050	1052	1055
90	12.7	31.4	60.9	101	161	225	287	336	374	401	401	394	386	396	408	421	427	431	433
95	9.21	18.7	33.6	53.9	82.9	115	147	177	203	223	228	229	229	239	250	260	264	266	267
100	8.70	16.3	26.3	39.0	55.4	73.4	92.1	110	127	143	155	165	176	188	201	211	216	219	220
105	8.04	15.1	22.9	31.5	41.1	51.2	61.4	71.3	80.8	89.7	96.6	103	111	124	136	147	153	156	157
110	6.71	11.4	16.9	23.2	30.9	39.1	47.3	54.9	62.0	68.4	73.1	77.4	81.4	87.0	92.2	96.6	98.3	98.9	99.0
115	5.91	10.2	14.9	20.1	25.9	32.1	38.7	46.3	53.7	60.3	64.1	67.2	69.9	74.0	77.9	81.0	81.6	81.5	81.1
120	5.13	9.11	13.2	17.4	21.2	25.5	30.7	39.6	48.5	56.2	58.3	59.0	59.3	62.6	66.2	69.3	70.3	70.7	70.7
125	4.47	7.49	10.7	14.1	17.4	21.1	25.6	32.6	39.9	46.7	50.8	53.9	56.1	58.2	59.8	60.9	61.1	61.1	61.0
130	4.02	5.51	7.66	10.5	14.0	18.1	22.8	28.1	33.7	39.5	45.9	51.8	56.6	58.3	58.8	58.6	58.3	58.0	57.6
135	3.58	3.92	5.24	7.56	11.4	15.8	20.5	24.2	27.9	31.7	36.2	40.9	45.9	51.8	57.1	61.2	61.5	60.7	59.4
140	3.11	2.81	3.60	5.48	9.31	13.6	17.7	19.5	21.0	22.4	25.1	28.1	31.4	34.7	38.0	41.2	44.2	46.7	48.1
145	2.74	1.75	1.87	3.10	6.33	10.0	13.5	14.6	15.4	16.2	18.6	21.2	23.7	25.1	26.2	27.0	28.1	28.9	29.5
150	2.40	1.73	1.72	2.39	4.12	6.22	8.41	9.75	11.1	12.5	14.8	17.1	19.1	19.9	20.4	20.7	21.6	22.3	22.9
155	2.09	1.74	1.71	1.99	2.62	3.53	4.70	6.10	7.70	9.45	11.6	13.6	15.2	15.4	15.2	14.8	15.0	15.3	15.5
160	1.82	1.76	1.72	1.70	1.50	1.47	1.76	2.95	4.42	6.01	7.40	8.64	9.62	10.0	10.2	10.2	10.2	10.2	10.2
165	1.55	1.54	1.51	1.47	1.36	1.28	1.26	1.36	1.58	1.96	2.69	3.51	4.31	4.83	5.25	5.57	5.78	5.91	5.99
170	1.44	1.42	1.39	1.35	1.31	1.26	1.21	1.17	1.12	1.07	1.03	0.99	0.96	0.94	0.93	0.94	1.02	1.10	1.18
175	1.52	1.50	1.49	1.47	1.44	1.42	1.39	1.36	1.33	1.29	1.26	1.22	1.19	1.16	1.14	1.12	1.10	1.10	1.11
180	1.64	1.64	1.63	1.62	1.60	1.58	1.56	1.54	1.51	1.48	1.45	1.42	1.39	1.36	1.34	1.33	1.33	1.34	1.35

UNIT: cd																			
C (DBG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	700	699	698	698	698	698	698	698	698	698	697	697	697	697	697	696	696	696	699
5	963	954	941	927	910	890	869	846	821	792	762	735	716	703	695	695	700	712	669
10	1721	1689	1645	1589	1527	1464	1415	1365	1309	1232	1145	1053	945	844	760	715	698	707	509
15	3459	3369	3232	3037	2807	2553	2276	2005	1760	1604	1476	1359	1199	1045	906	808	736	690	449
20	4486	4415	4308	4200	4044	3822	3447	3027	2598	2232	1904	1623	1434	1282	1150	994	839	684	424
25	4906	4934	4929	4847	4701	4484	4150	3758	3330	2883	2445	2039	1738	1479	1247	1011	790	582	371
30	3931	3997	4093	4276	4436	4524	4420	4201	3873	3379	2835	2292	1880	1520	1210	942	720	544	403
35	3588	3593	3609	3648	3702	3771	3977	4108	4075	3494	2786	2078	1717	1448	1231	979	743	522	431
40	3278	3363	3439	3392	3345	3336	3598	3825	3909	3447	2844	2209	1827	1504	1224	941	681	444	409
45	2953	2967	2991	3019	3055	3101	3229	3314	3301	2984	2575	2135	1821	1527	1243	948	654	361	366
50	2810	2796	2776	2743	2717	2707	2791	2859	2866	2680	2417	2102	1773	1433	1098	805	531	278	285
55	2783	2762	2734	2697	2656	2613	2583	2544	2484	2411	2289	2097	1721	1305	898	616	391	225	230
60	2803	2768	2719	2663	2597	2523	2433	2341	2252	2236	2186	2058	1665	1217	779	505	305	182	189
65	2833	2812	2771	2698	2608	2505	2394	2279	2161	2094	1997	1836	1458	1042	645	402	235	146	149
70	2845	2824	2779	2696	2592	2474	2365	2241	2098	1929	1727	1488	1146	798	483	289	166	114	107
75	2747	2729	2689	2610	2512	2401	2314	2204	2054	1802	1513	1205	895	606	359	202	107	75.0	66.9
80	2133	2130	2119	2094	2061	2022	2013	1975	1884	1644	1355	1046	763	506	289	150	67.7	42.2	39.9
85	1052	1050	1047	1038	1031	1031	1072	1104	1107	1024	903	752	569	385	219	117	52.0	24.7	26.3
90	431	427	421	408	396	386	394	401	401	374	336	287	225	161	101	60.9	31.4	12.7	13.6
95	266	264	260	250	239	229	229	228	223	203	177	147	115	82.9	53.9	33.6	18.7	9.21	9.73
100	219	216	211	201	188	176	165	155	143	127	110	92.1	73.4	55.4	39.0	26.3	16.3	8.70	8.40
105	156	153	147	136	124	111	103	96.6	89.7	80.8	71.3	61.4	51.2	41.1	31.5	22.9	15.1	8.04	7.63
110	98.9	98.3	96.6	92.2	87.0	81.4	77.4	73.1	68.4	62.0	54.9	47.3	39.1	30.9	23.2	16.9	11.4	6.71	6.63
115	81.5	81.6	81.0	77.9	74.0	69.9	67.2	64.1	60.3	53.7	46.3	38.7	32.1	25.9	20.1	14.9	10.2	5.91	6.08
120	70.7	70.3	69.3	66.2	62.6	59.3	59.0	58.3	56.2	48.5	39.6	30.7	25.5	21.2	17.4	13.2	9.11	5.13	6.07
125	61.1	61.1	60.9	59.8	58.2	56.1	53.9	50.8	46.7	39.9	32.6	25.6	21.1	17.4	14.1	10.7	7.49	4.47	5.33
130	58.0	58.3	58.6	58.8	58.3	56.6	51.8	45.9	39.5	33.7	28.1	22.8	18.1	14.0	10.5	7.66	5.51	4.02	4.20
135	60.7	61.5	61.2	57.1	51.8	45.9	40.9	36.2	31.7	27.9	24.2	20.5	15.8	11.4	7.56	5.24	3.92	3.58	3.86
140	46.7	44.2	41.2	38.0	34.7	31.4	28.1	25.1	22.4	21.0	19.5	17.7	13.6	9.31	5.48	3.60	2.81	3.11	3.34
145	28.9	28.1	27.0	26.2	25.1	23.7	21.2	18.6	16.2	15.4	14.6	13.5	10.0	6.33	3.10	1.87	1.75	2.74	3.03
150	22.3	21.6	20.7	20.4	19.9	19.1	17.1	14.8	12.5	11.1	9.75	8.41	6.22	4.12	2.39	1.72	1.73	2.40	2.72
155	15.3	15.0	14.8	15.2	15.4	15.2	13.6	11.6	9.45	7.70	6.10	4.70	3.53	2.62	1.99	1.71	1.74	2.09	2.43
160	10.2	10.2	10.2	10.2	10.0	9.62	8.64	7.40	6.01	4.42	2.95	1.76	1.47	1.50	1.70	1.72	1.76	1.82	2.16
165	5.91	5.78	5.57	5.25	4.83	4.31	3.51	2.69	1.96	1.58	1.36	1.26	1.28	1.36	1.47	1.51	1.54	1.55	1.87
170	1.10	1.02	0.94	0.93	0.94	0.96	0.99	1.03	1.07	1.12	1.17	1.21	1.26	1.31	1.35	1.39	1.42	1.44	1.69
175	1.10	1.10	1.12	1.14	1.16	1.19	1.22	1.26	1.29	1.33	1.36	1.39	1.42	1.44	1.47	1.49	1.50	1.52	1.67
180	1.34	1.33	1.33	1.34	1.36	1.39	1.42	1.45	1.48	1.51	1.54	1.56	1.58	1.60	1.62	1.63	1.64	1.64	1.62



Table--3

UNIT: cd

C (DEG) γ (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	701	702	703	703	702	702	702	701	701	701	701	701	701	701	700	700	700	700	700
5	602	532	439	346	264	219	191	174	163	156	154	151	149	148	147	147	146	147	147
10	353	239	180	153	148	146	154	173	205	240	272	282	287	290	306	321	331	321	306
15	274	163	140	165	222	281	345	404	434	454	466	476	481	479	461	443	430	443	461
20	247	151	178	256	356	416	460	478	432	369	304	280	266	259	251	247	245	247	251
25	235	174	243	347	445	417	362	299	277	263	251	229	209	191	186	185	187	185	186
30	306	252	269	308	349	336	310	276	243	211	181	161	145	134	128	126	126	126	128
35	361	315	306	309	311	284	251	215	181	151	127	118	115	110	106	103	106	110	
40	376	345	317	290	261	226	189	155	128	105	85.7	69.8	57.7	49.1	45.7	44.9	45.7	44.9	45.7
45	359	340	300	254	207	173	142	115	88.3	64.8	45.9	35.9	30.3	27.5	24.7	23.2	23.0	23.2	24.7
50	282	268	239	202	163	127	93.2	64.2	45.7	32.6	23.7	17.0	12.8	10.5	8.91	8.34	8.52	8.34	8.91
55	226	212	185	152	117	86.9	59.5	36.8	24.7	17.4	13.3	9.16	6.42	4.81	4.05	3.92	4.20	3.92	4.05
60	186	175	147	115	82.1	59.5	41.1	26.8	18.2	12.7	9.47	6.18	3.91	2.51	1.90	1.81	2.03	1.81	1.90
65	144	132	106	77.5	50.2	36.1	26.4	19.9	14.4	10.4	7.50	4.64	2.45	0.95	0.46	0.45	0.71	0.45	0.46
70	97.4	85.7	69.4	52.6	37.1	27.4	20.1	14.8	10.9	8.11	6.05	3.75	1.91	0.59	0.25	0.32	0.58	0.32	0.25
75	58.8	50.8	42.4	34.3	27.0	21.2	16.4	12.5	9.63	7.37	5.56	3.66	2.10	0.96	0.68	0.74	0.96	0.74	0.68
80	37.2	34.1	30.1	26.0	21.8	17.9	14.3	11.1	8.70	6.69	5.03	3.48	2.26	1.40	1.18	1.23	1.41	1.23	1.18
85	26.7	26.0	23.6	20.6	17.2	14.5	12.0	9.71	7.74	6.02	4.57	3.37	2.44	1.80	1.64	1.69	1.83	1.69	1.64
90	14.0	13.9	13.1	11.9	10.6	9.62	8.62	7.57	6.20	4.87	3.68	2.95	2.46	2.18	2.10	2.13	2.21	2.13	2.10
95	9.89	9.66	8.85	7.83	6.75	6.03	5.38	4.77	4.05	3.39	2.84	2.59	2.46	2.43	2.42	2.44	2.47	2.44	2.42
100	8.03	7.58	7.02	6.42	5.81	5.24	4.70	4.18	3.65	3.19	2.82	2.66	2.60	2.61	2.61	2.63	2.66	2.63	2.61
105	7.19	6.71	6.14	5.57	5.03	4.62	4.27	3.94	3.54	3.19	2.90	2.78	2.74	2.74	2.74	2.76	2.78	2.76	2.74
110	6.44	6.15	5.67	5.15	4.64	4.32	4.05	3.81	3.47	3.15	2.89	2.78	2.74	2.73	2.73	2.74	2.75	2.74	2.73
115	6.08	5.91	5.47	4.96	4.44	4.16	3.92	3.71	3.41	3.12	2.88	2.77	2.73	2.72	2.71	2.72	2.73	2.72	2.71
120	6.57	6.64	5.97	5.09	4.19	3.87	3.69	3.57	3.31	3.07	2.86	2.77	2.73	2.72	2.71	2.71	2.71	2.71	2.71
125	5.82	5.94	5.46	4.78	4.07	3.79	3.62	3.49	3.28	3.09	2.94	2.88	2.86	2.86	2.85	2.84	2.83	2.84	2.85
130	4.31	4.34	4.27	4.15	3.99	3.80	3.60	3.41	3.24	3.10	3.00	2.98	3.00	3.03	3.03	3.03	3.03	3.03	3.03
135	4.02	4.08	3.98	3.81	3.62	3.48	3.36	3.25	3.14	3.04	2.97	2.99	3.03	3.09	3.11	3.12	3.12	3.12	3.11
140	3.50	3.60	3.61	3.56	3.47	3.33	3.17	3.03	2.95	2.90	2.88	2.92	2.98	3.04	3.07	3.10	3.10	3.10	3.07
145	3.22	3.31	3.27	3.17	3.03	2.95	2.87	2.80	2.77	2.76	2.77	2.81	2.87	2.93	2.98	3.00	3.00	3.00	2.98
150	2.95	3.07	3.04	2.94	2.81	2.74	2.68	2.63	2.62	2.63	2.66	2.70	2.74	2.77	2.80	2.81	2.80	2.81	2.80
155	2.67	2.81	2.79	2.70	2.59	2.55	2.51	2.49	2.47	2.46	2.46	2.48	2.51	2.52	2.50	2.46	2.42	2.46	2.50
160	2.41	2.56	2.56	2.50	2.42	2.42	2.42	2.42	2.38	2.34	2.29	2.28	2.26	2.24	2.19	2.13	2.06	2.13	2.19
165	2.11	2.27	2.31	2.29	2.25	2.24	2.22	2.19	2.14	2.08	2.01	1.93	1.86	1.80	1.75	1.70	1.67	1.70	1.75
170	1.87	1.99	2.02	2.00	1.94	1.90	1.84	1.77	1.67	1.57	1.46	1.37	1.30	1.24	1.22	1.22	1.23	1.22	1.22
175	1.77	1.85	1.87	1.86	1.83	1.75	1.66	1.57	1.50	1.43	1.38	1.33	1.28	1.25	1.24	1.25	1.27	1.25	1.24
180	1.61	1.60	1.61	1.61	1.61	1.61	1.60	1.57	1.53	1.48	1.43	1.39	1.36	1.33	1.32	1.32	1.33	1.32	1.32

C (DEG) γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	701	701	701	701	701	701	701	702	702	702	703	703	702	701	699				
5	148	149	151	154	156	163	174	191	219	264	346	439	532	602	662				
10	290	287	282	272	240	205	173	154	146	148	153	180	239	353	509				
15	479	481	476	466	454	434	404	345	281	222	165	140	163	274	449				
20	259	266	280	304	369	432	478	460	416	356	256	178	151	247	424				
25	191	209	229	251	263	277	299	362	417	445	347	243	174	235	371				
30	134	145	161	181	211	243	276	310	336	349	308	269	252	306	403				
35	115	115	118	127	151	181	215	251	284	311	308	306	315	361	431				
40	49.1	57.7	69.8	85.7	105	128	155	189	226	261	290	317	345	376	409				
45	27.5	30.3	35.9	45.9	64.8	88.3	115	142	173	207	254	300	340	359	366				
50	10.5	12.8	17.0	23.7	32.6	45.7	64.2	93.2	127	163	202	239	268	282	285				
55	4.81	6.42	9.16	13.3	17.4	24.7	36.8	59.5	86.9	117	152	185	212	226	230				
60	2.51	3.91	6.18	9.47	12.7	18.2	26.8	41.1	59.5	82.1	115	147	175	186	189				
65	0.95	2.45	4.64	7.50	10.4	14.4	19.9	26.4	36.1	50.2	77.5	106	132	144	149				
70	0.59	1.91	3.75	6.05	8.11	10.9	14.8	20.1	27.4	37.1	52.6	69.4	85.7	97.4	107				
75	0.96	2.10	3.66	5.56	7.37	9.63	12.5	16.4	21.2	27.0	34.3	42.4	50.8	58.8	66.9				
80	1.40	2.26	3.48	5.03	6.69	8.70	11.1	14.3	17.9	21.8	26.0	30.1	34.1	37.2	39.9				
85	1.80	2.44	3.37	4.57	6.02	7.74	9.71	12.0	14.5	17.2	20.6	23.6	26.0	26.7	26.3				
90	2.18	2.46	2.95	3.68	4.87	6.20	7.57	8.62	9.62	10.6	11.9	13.1	13.9	14.0	13.6				
95	2.43	2.46	2.59	2.84	3.39	4.05	4.77	5.38	6.03	6.75	7.83	8.85	9.66	9.89	9.73				
100	2.61	2.60	2.66	2.82	3.19	3.65	4.18	4.70	5.24	5.81	6.42	7.02	7.58	8.03	8.40				
105	2.74	2.74	2.78	2.90	3.19	3.54	3.94	4.27	4.62	5.03	5.57	6.14	6.71	7.19	7.63				
110	2.73	2.74	2.78	2.89	3.15	3.47	3.81	4.05	4.32	4.64	5.15	5.67	6.15	6.44	6.63				
115	2.72	2.73	2.77	2.88	3.12	3.41	3.71	3.92	4.16	4.44	4.96	5.47	5.91	6.08	6.08				
120	2.72	2.73	2.77	2.86	3.07	3.31	3.57	3.69	3.87	4.19	5.09	5.97	6.64	6.57	6.07				
125	2.86	2.86	2.88	2.94	3.09	3.28	3.49	3.62	3.79	4.07	4.78	5.46	5.94	5.82	5.33				
130	3.03	3.00	2.98	3.00	3.10	3.24	3.41	3.60	3.80	3.99	4.15	4.27	4.34	4.31	4.20				
135	3.09	3.03	2.99	2.97	3.04	3.14	3.25	3.36	3.48	3.62	3.81	3.98	4.08	4.02	3.86				
140	3.04	2.98	2.92	2.88	2.90	2.95	3.03	3.17	3.33	3.47	3.56	3.61	3.60	3.50	3.34				
145	2.93	2.87	2.81	2.77	2.76	2.77	2.80	2.87	2.95	3.03	3.17	3.27	3.31	3.22	3.03				
150	2.77	2.74	2.70	2.66	2.63	2.62	2.63	2.68	2.74	2.81	2.94	3.04	3.07	2.95	2.72				
155	2.52	2.51	2.48	2.46	2.46	2.47	2.49	2.51	2.55	2.59	2.70	2.79	2.81	2.67	2.43				
160	2.24	2.26	2.28	2.29	2.34	2.38	2.42	2.42	2.42	2.42	2.50	2.56	2.56	2.41	2.16				
165	1.80	1.86	1.93	2.01	2.08	2.14	2.19	2.22	2.24	2.25	2.29	2.31	2.27	2.11	1.87				
170	1.24	1.30	1.37	1.46	1.57	1.67	1.77	1.84	1.90	1.94	2.00	2.02	1.99	1.87	1.69				
175	1.25	1.28	1.33	1.38	1.43	1.50	1.57	1.66	1.75	1.83	1.86	1.87	1.85	1.77	1.67				
180	1.33	1.36	1.39	1.43	1.48	1.53	1.57	1.60	1.61	1.61	1.61	1.61	1.60	1.61	1.61				

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

<b>Model No.</b>	W34M @ 40W / 5000K	<b>Sample ID</b>	230612002-S1
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

<b>Test Method</b>
<p>The samples were tested according to the ANSI C82.77:2014</p> <p>The total harmonic distortion shall be measured to the 40th order.</p> <p>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.</p>

### Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD(%)
120.0	60	0.356	42.4	0.992	2.63
277.0	60	0.181	42.5	0.848	12.58



## 5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2022-11-09	2023-11-08
NTC-F01-006	2.0 meter Integrating Sphere	2022-11-09	2023-11-08
NTC-F01-012	Standard Lamp	2022-11-09	2023-11-08
NTC-F01-013	Standard Lamp	2022-11-09	2023-11-08
NTC-F01-031	Digital Power Meter	2022-08-31	2023-08-30
NTC-F01-019	Temperature & Humidity Meter	2022-11-12	2023-11-11

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