

## 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:

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Date: 2023-06-14

Review by:

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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		5133
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		131.3
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		4990
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	127.6
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		39.1
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.87
			277V	6.02
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
			277V	0.924
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3045±175	3097
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		73.4
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-28
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		77
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		95
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-16%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		4.6%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		120.0
(Goniophotometer – Section 4.2)		Non-Worst Case		277.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.328
(Goniophotometer – Section 4.2)		Non-Worst Case		0.152
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		39.1
(Goniophotometer – Section 4.2)		Non-Worst Case		39.0

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34S @ 35W / 3000K	230612003-S1
2	Goniophotometer Test	2023-06-13	W34S @ 35W / 3000K	230612003-S1
3	THD and PF Test	2023-06-13	W34S @ 35W / 3000K	230612003-S1

### Remark (If any)

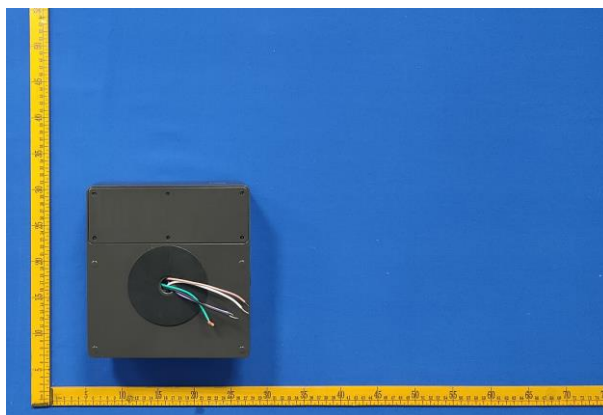
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

## 3.0 Product Description

Luminaire Description: Model No. W34S @ 35W / 3000K, 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>	W34S @ 35W / 3000K	<b>Sample ID</b>	230612003-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

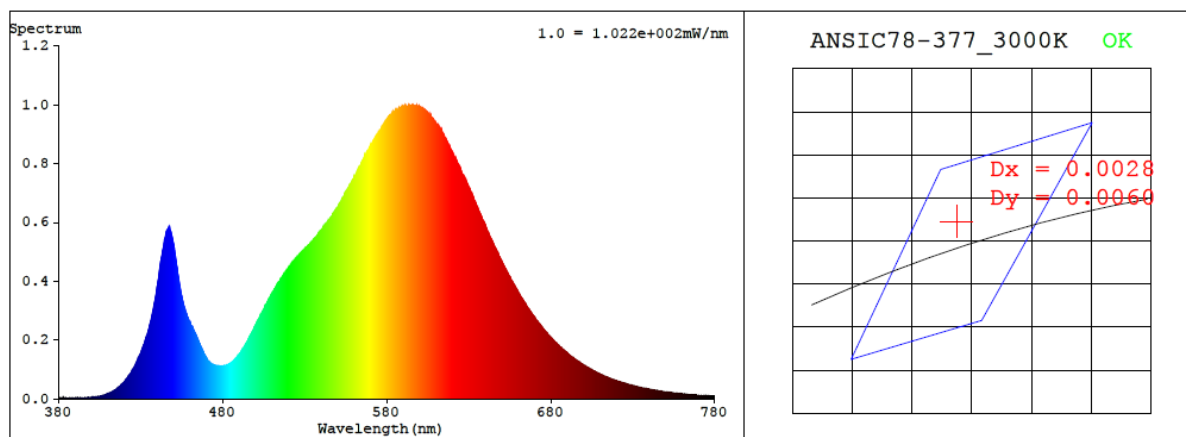
<b>Test Method</b>
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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.</p> <p>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	0.328	39.1	0.995
277.0	60	0.152	39.0	0.924

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3097	73.4	-28	0.0020	77	95	-16%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.4330$   $y = 0.4077$  /  $u' = 0.2465$   $v' = 0.5222$  ( $duv=2.00e-03$ )

CCT= 3097K Prcp WL:  $L_d=581.7nm$  Purity=52.3%

Peak WL:  $L_p=596nm$  FWHM:  $=119.3nm$  Ratio:  $R=20.8\%$   $G=77.4\%$   $B=1.9\%$

Render Index:  $R_a = 73.4$   $AvgR = 64.5$   $TM30:R_f=76$   $R_g=94$

EEL: 0.10544 A++ Highest

R1 =70	R2 =82	R3 =94	R4 =71	R5 =69	R6 =76	R7 =79
R8 =47	R9 =-28	R10=60	R11=66	R12=53	R13=72	R14=97 R15=62

## 4.1 Integrating Sphere Test

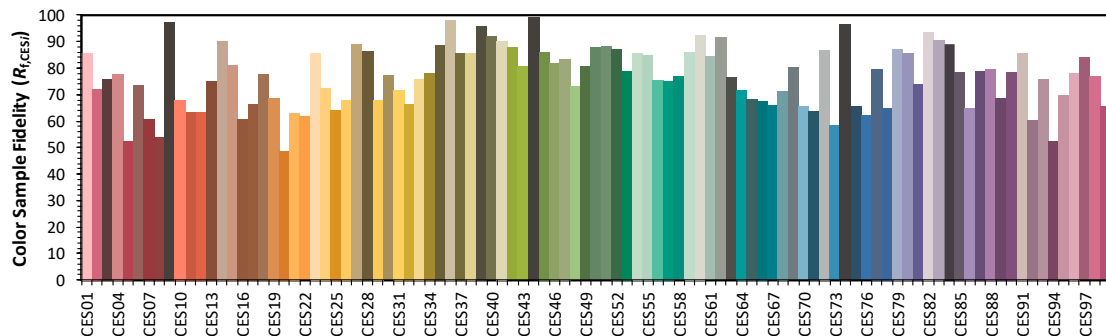
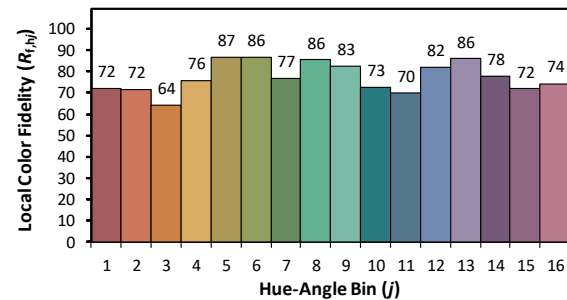
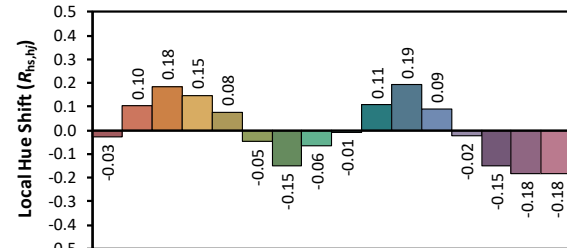
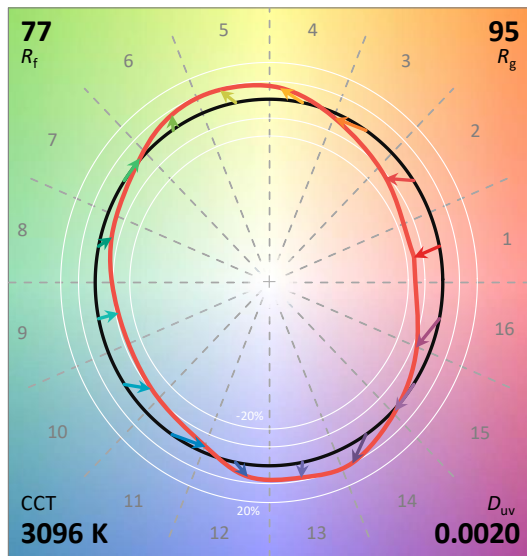
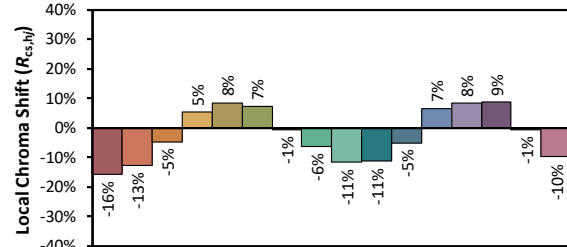
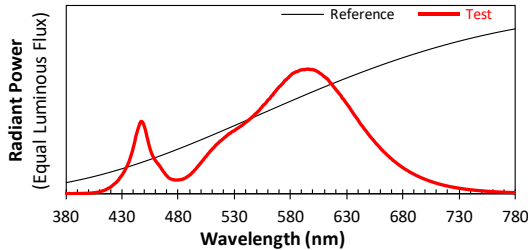
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34S @ 35W / 3000K



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

$x$  0.4330  
 $y$  0.4075  
 $u'$  0.2466  
 $v'$  0.5222

CIE 13.3-1995  
(CRI)

$R_a$  73  
 $R_g$  -28

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

## 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	3.80E-06	447	5.80E-04	514	3.96E-04	581	9.58E-04	648	4.93E-04	715	7.22E-05
381	2.40E-06	448	5.72E-04	515	4.03E-04	582	9.65E-04	649	4.80E-04	716	7.03E-05
382	2.00E-06	449	5.55E-04	516	4.12E-04	583	9.68E-04	650	4.69E-04	717	6.78E-05
383	3.20E-06	450	5.27E-04	517	4.21E-04	584	9.74E-04	651	4.57E-04	718	6.59E-05
384	1.70E-06	451	4.94E-04	518	4.27E-04	585	9.76E-04	652	4.46E-04	719	6.39E-05
385	2.10E-06	452	4.55E-04	519	4.35E-04	586	9.81E-04	653	4.36E-04	720	6.22E-05
386	1.10E-06	453	4.18E-04	520	4.43E-04	587	9.83E-04	654	4.26E-04	721	5.97E-05
387	3.10E-06	454	3.82E-04	521	4.51E-04	588	9.89E-04	655	4.15E-04	722	5.82E-05
388	2.50E-06	455	3.51E-04	522	4.57E-04	589	9.91E-04	656	4.03E-04	723	5.60E-05
389	2.20E-06	456	3.26E-04	523	4.66E-04	590	9.93E-04	657	3.95E-04	724	5.47E-05
390	2.30E-06	457	3.06E-04	524	4.72E-04	591	9.95E-04	658	3.85E-04	725	5.26E-05
391	2.90E-06	458	2.87E-04	525	4.82E-04	592	9.93E-04	659	3.75E-04	726	5.13E-05
392	2.60E-06	459	2.73E-04	526	4.84E-04	593	9.95E-04	660	3.64E-04	727	5.00E-05
393	3.80E-06	460	2.60E-04	527	4.93E-04	594	9.99E-04	661	3.55E-04	728	4.80E-05
394	2.80E-06	461	2.47E-04	528	4.98E-04	595	9.97E-04	662	3.46E-04	729	4.70E-05
395	3.50E-06	462	2.38E-04	529	5.03E-04	596	9.99E-04	663	3.37E-04	730	4.55E-05
396	4.20E-06	463	2.26E-04	530	5.08E-04	597	9.95E-04	664	3.28E-04	731	4.41E-05
397	4.30E-06	464	2.13E-04	531	5.15E-04	598	9.96E-04	665	3.20E-04	732	4.23E-05
398	4.90E-06	465	1.98E-04	532	5.21E-04	599	9.94E-04	666	3.10E-04	733	4.12E-05
399	4.50E-06	466	1.86E-04	533	5.26E-04	600	9.95E-04	667	3.03E-04	734	3.96E-05
400	5.00E-06	467	1.73E-04	534	5.33E-04	601	9.90E-04	668	2.94E-04	735	3.86E-05
401	6.20E-06	468	1.62E-04	535	5.38E-04	602	9.88E-04	669	2.87E-04	736	3.70E-05
402	5.70E-06	469	1.50E-04	536	5.45E-04	603	9.83E-04	670	2.79E-04	737	3.61E-05
403	7.00E-06	470	1.41E-04	537	5.50E-04	604	9.78E-04	671	2.69E-04	738	3.51E-05
404	8.50E-06	471	1.30E-04	538	5.58E-04	605	9.72E-04	672	2.63E-04	739	3.39E-05
405	9.00E-06	472	1.25E-04	539	5.66E-04	606	9.65E-04	673	2.56E-04	740	3.32E-05
406	1.01E-05	473	1.20E-04	540	5.73E-04	607	9.60E-04	674	2.49E-04	741	3.19E-05
407	1.19E-05	474	1.17E-04	541	5.78E-04	608	9.53E-04	675	2.41E-04	742	3.10E-05
408	1.32E-05	475	1.14E-04	542	5.87E-04	609	9.44E-04	676	2.35E-04	743	3.01E-05
409	1.50E-05	476	1.12E-04	543	5.94E-04	610	9.38E-04	677	2.28E-04	744	2.90E-05
410	1.85E-05	477	1.11E-04	544	6.02E-04	611	9.32E-04	678	2.23E-04	745	2.83E-05
411	2.03E-05	478	1.11E-04	545	6.10E-04	612	9.23E-04	679	2.15E-04	746	2.73E-05
412	2.26E-05	479	1.11E-04	546	6.17E-04	613	9.19E-04	680	2.09E-04	747	2.66E-05
413	2.54E-05	480	1.12E-04	547	6.26E-04	614	9.04E-04	681	2.03E-04	748	2.56E-05
414	2.86E-05	481	1.13E-04	548	6.35E-04	615	8.93E-04	682	1.98E-04	749	2.47E-05
415	3.22E-05	482	1.14E-04	549	6.44E-04	616	8.84E-04	683	1.92E-04	750	2.42E-05
416	3.74E-05	483	1.16E-04	550	6.51E-04	617	8.72E-04	684	1.87E-04	751	2.32E-05
417	4.18E-05	484	1.18E-04	551	6.61E-04	618	8.60E-04	685	1.82E-04	752	2.28E-05
418	4.68E-05	485	1.23E-04	552	6.69E-04	619	8.49E-04	686	1.75E-04	753	2.20E-05
419	5.20E-05	486	1.27E-04	553	6.82E-04	620	8.38E-04	687	1.70E-04	754	2.13E-05
420	5.75E-05	487	1.32E-04	554	6.91E-04	621	8.25E-04	688	1.65E-04	755	2.05E-05
421	6.55E-05	488	1.38E-04	555	7.03E-04	622	8.17E-04	689	1.61E-04	756	2.00E-05
422	7.32E-05	489	1.44E-04	556	7.12E-04	623	8.04E-04	690	1.56E-04	757	1.94E-05
423	8.02E-05	490	1.51E-04	557	7.20E-04	624	7.94E-04	691	1.51E-04	758	1.89E-05
424	8.75E-05	491	1.58E-04	558	7.29E-04	625	7.83E-04	692	1.47E-04	759	1.85E-05
425	9.57E-05	492	1.68E-04	559	7.42E-04	626	7.65E-04	693	1.42E-04	760	1.77E-05
426	1.06E-04	493	1.76E-04	560	7.53E-04	627	7.58E-04	694	1.39E-04	761	1.71E-05
427	1.17E-04	494	1.86E-04	561	7.60E-04	628	7.45E-04	695	1.34E-04	762	1.66E-05
428	1.31E-04	495	1.95E-04	562	7.71E-04	629	7.32E-04	696	1.30E-04	763	1.60E-05
429	1.42E-04	496	2.06E-04	563	7.85E-04	630	7.20E-04	697	1.27E-04	764	1.55E-05
430	1.54E-04	497	2.17E-04	564	7.91E-04	631	7.08E-04	698	1.22E-04	765	1.49E-05
431	1.70E-04	498	2.28E-04	565	8.07E-04	632	6.96E-04	699	1.19E-04	766	1.50E-05
432	1.84E-04	499	2.39E-04	566	8.16E-04	633	6.82E-04	700	1.16E-04	767	1.43E-05
433	2.03E-04	500	2.50E-04	567	8.28E-04	634	6.68E-04	701	1.13E-04	768	1.39E-05
434	2.18E-04	501	2.61E-04	568	8.39E-04	635	6.54E-04	702	1.09E-04	769	1.35E-05
435	2.39E-04	502	2.71E-04	569	8.48E-04	636	6.41E-04	703	1.05E-04	770	1.31E-05
436	2.60E-04	503	2.84E-04	570	8.60E-04	637	6.28E-04	704	1.02E-04	771	1.26E-05
437	2.87E-04	504	2.94E-04	571	8.66E-04	638	6.16E-04	705	9.96E-05	772	1.24E-05
438	3.14E-04	505	3.03E-04	572	8.76E-04	639	6.03E-04	706	9.59E-05	773	1.19E-05
439	3.45E-04	506	3.17E-04	573	8.85E-04	640	5.92E-04	707	9.32E-05	774	1.16E-05
440	3.81E-04	507	3.27E-04	574	8.97E-04	641	5.76E-04	708	8.99E-05	775	1.08E-05
441	4.15E-04	508	3.38E-04	575	9.10E-04	642	5.63E-04	709	8.76E-05	776	1.10E-05
442	4.60E-04	509	3.48E-04	576	9.13E-04	643	5.50E-04	710	8.48E-05	777	1.08E-05
443	4.90E-04	510	3.58E-04	577	9.23E-04	644	5.40E-04	711	8.20E-05	778	1.01E-05
444	5.22E-04	511	3.66E-04	578	9.31E-04	645	5.28E-04	712	7.97E-05	779	1.01E-05
445	5.49E-04	512	3.76E-04	579	9.41E-04	646	5.15E-04	713	7.69E-05	780	1.01E-05
446	5.73E-04	513	3.87E-04	580	9.49E-04	647	5.05E-04	714	7.51E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	W34S @ 35W / 3000K	<b>Sample ID</b>	230612003-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.0	<b>Humidity (%RH)</b>	40.1

<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>	120.0	60	0.328	39.1	0.995
<b>NON-WORST CASE</b>	277.0	60	0.152	39.0	0.924

#### Test Result

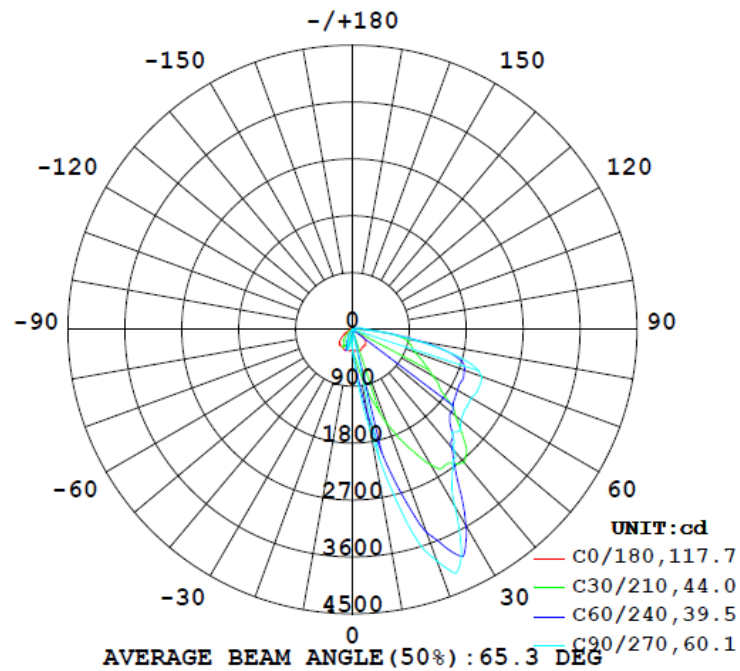
Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement (80°-90°)	BUG
		C0-180	C90-270	C0-180	C90-270			
<b>0°-180° zones</b>	5133	83.8	132.0	55.8	80.1	131.3	4.5%	B0-U3-G3
<b>0°-90° zones</b>	4990	83.8	132.0	55.8	80.1	127.6	4.6%	B0-U3-G3



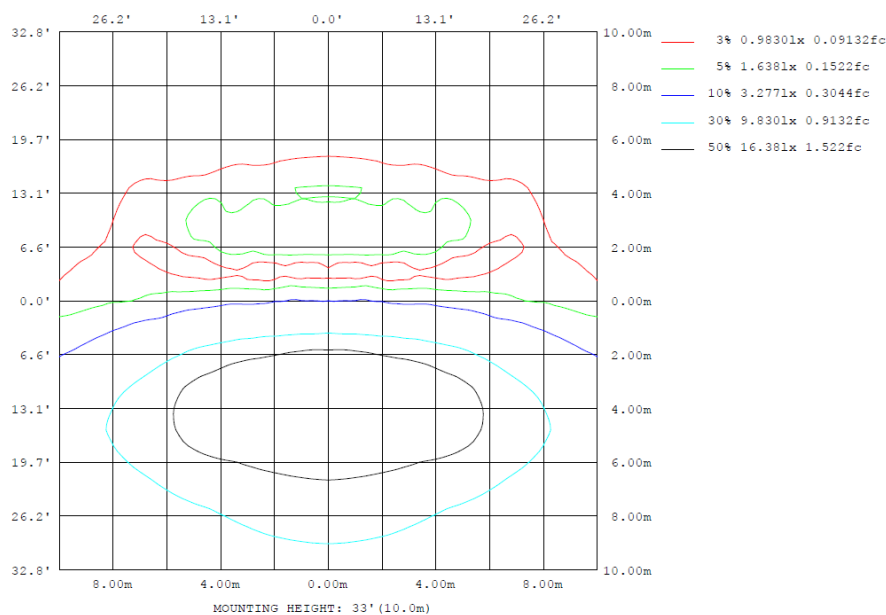
## 4.2 Goniophotometer Test

### Lighting Distribution Curve

#### LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

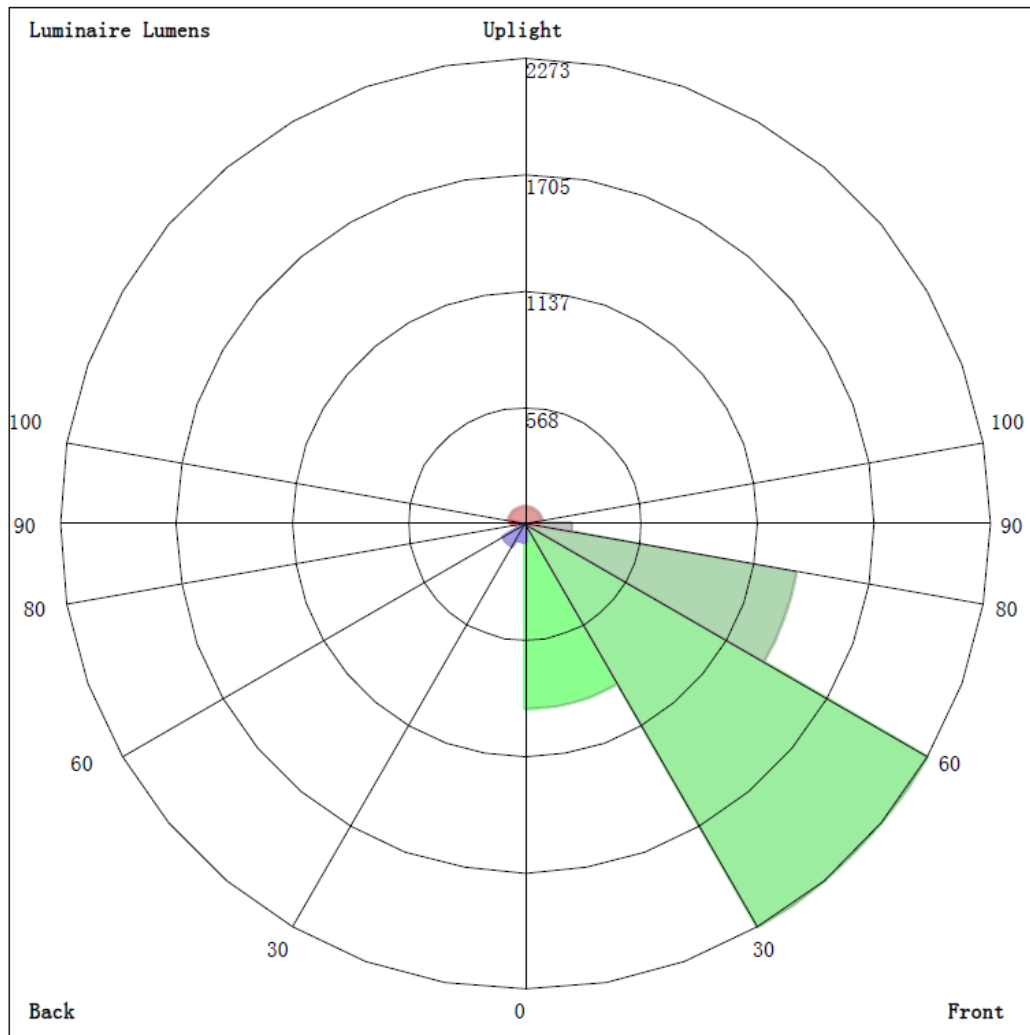
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	ℓlum, lamp
10	335.3	1018	1637	1018	335.3	80.37	189.5	80.37	0- 10	40.92	40.92	0.80,0.80
20	360.5	2474	3893	2474	360.5	293.9	196.1	293.9	10- 20	282.9	323.8	6.31,6.31
30	332.4	3605	3241	3605	332.4	224.9	106.8	224.9	20- 30	663.7	987.5	19.2,19.2
40	315.8	2850	2499	2850	315.8	117.8	38.41	117.8	30- 40	803.8	1791	34.9,34.9
50	248.4	2044	2241	2044	248.4	51.99	5.111	51.99	40- 50	811.3	2603	50.7,50.7
60	155.7	1717	2167	1717	155.7	18.58	1.428	18.58	50- 60	782.1	3385	65.9,65.9
70	83.45	1598	2168	1598	83.45	10.23	0.3066	10.23	60- 70	748.7	4133	80.5,80.5
80	27.30	1139	1054	1139	27.30	6.257	0.8058	6.257	70- 80	624.6	4758	92.7,92.7
90	8.737	203.7	222.9	203.7	8.737	3.819	1.448	3.819	80- 90	231.7	4990	97.2,97.2
100	5.923	90.54	148.3	90.54	5.923	2.744	1.886	2.744	90-100	64.06	5054	98.5,98.5
110	4.858	41.10	63.49	41.10	4.858	2.612	1.988	2.612	100-110	32.47	5086	99.1,99.1
120	3.579	33.92	46.30	33.92	3.579	2.592	1.974	2.592	110-120	18.42	5105	99.5,99.5
130	2.975	23.02	37.36	23.02	2.975	2.660	2.319	2.660	120-130	12.96	5118	99.7,99.7
140	2.369	13.45	22.98	13.45	2.369	2.457	2.506	2.457	130-140	8.709	5126	99.9,99.9
150	1.839	8.172	13.35	8.172	1.839	2.129	2.316	2.129	140-150	3.990	5130	100,100
160	1.451	3.673	6.387	3.673	1.451	1.925	1.779	1.925	150-160	1.794	5132	100,100
170	1.252	0.9237	0.7487	0.9237	1.252	1.489	1.011	1.489	160-170	0.5560	5133	100,100
180	1.407	1.257	1.168	1.257	1.407	1.319	1.119	1.319	170-180	0.1102	5133	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	40.92	0-10	40.92	0.80%
10-20	282.91	0-20	323.83	6.31%
20-30	663.70	0-30	987.53	19.24%
30-40	803.76	0-40	1791.29	34.90%
40-50	811.35	0-50	2602.64	50.71%
50-60	782.07	0-60	3384.71	65.94%
60-70	748.69	0-70	4133.40	80.53%
70-80	624.64	0-80	4758.04	92.70%
80-90	231.70	0-90	4989.74	97.21%
90-100	64.06	0-100	5053.80	98.46%
100-110	32.47	0-110	5086.27	99.10%
110-120	18.42	0-120	5104.69	99.45%
120-130	12.96	0-130	5117.65	99.71%
130-140	8.71	0-140	5126.36	99.88%
140-150	3.99	0-150	5130.35	99.95%
150-160	1.79	0-160	5132.14	99.99%
160-170	0.56	0-170	5132.70	100.00%
170-180	0.11	0-180	5132.81	100.00%

## 4.2 Goniophotometer Test

LCS/BUG

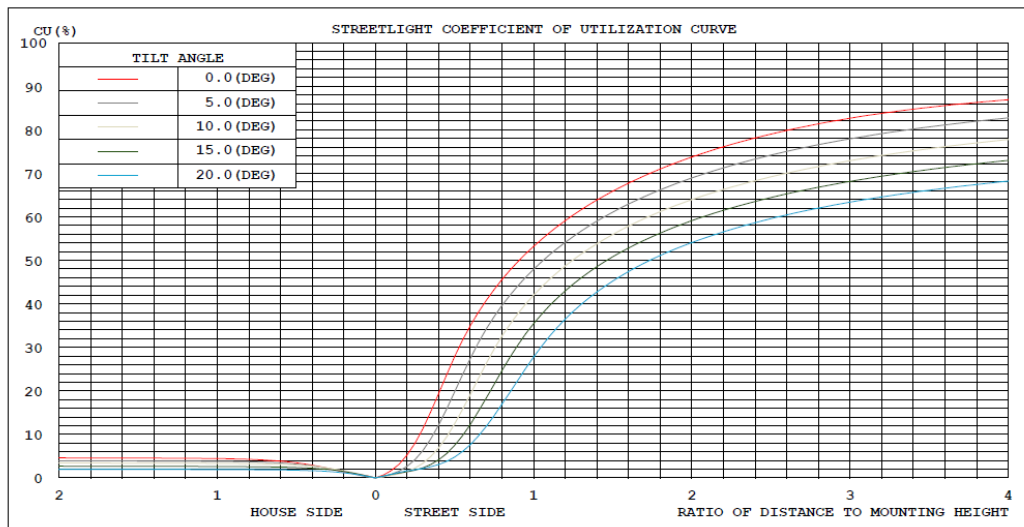


### LUMINAIRE CLASSIFICATION SYSTEM (LCS)

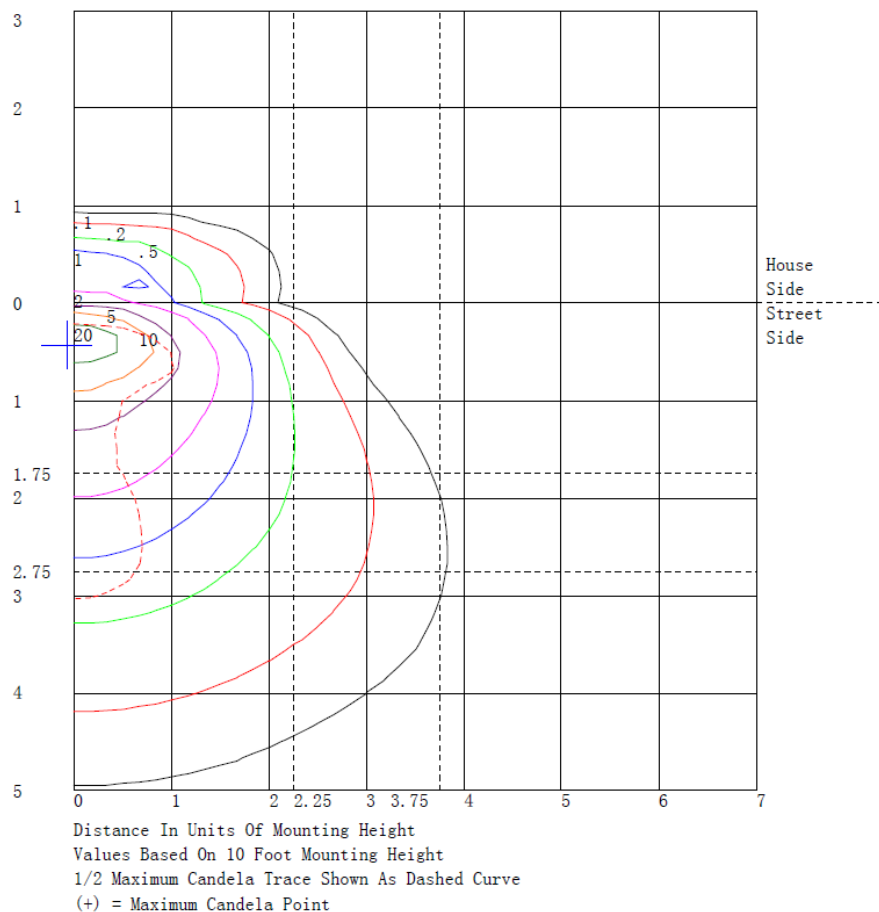
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	901.1	N.A.	17.6
FM - Front-Medium (30-60)	2273.5	N.A.	44.3
FH - Front-High (60-80)	1346.0	N.A.	26.2
FVH - Front-Very High (80-90)	227.9	N.A.	4.4
BL - Back-Low (0-30)	86.4	N.A.	1.7
BM - Back-Medium (30-60)	123.7	N.A.	2.4
BH - Back-High (60-80)	27.3	N.A.	0.5
BVH - Back-Very High (80-90)	3.8	N.A.	0.1
UL - Uplight-Low (90-100)	64.1	N.A.	1.2
UH - Uplight-High (100-180)	79.0	N.A.	1.5
Total	5132.8	N.A.	100.0
BUG Rating	B0-U3-G3		

## 4.2 Goniophotometer Test

### Coefficients of Utilization



## Isolines



## 4.2 Goniophotometer Test

### Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG) y (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	329	329	329	329	330	330	331	331	331	332	332	332	333	333	334	335	336	336	337
5	331	347	365	385	407	431	454	473	492	512	538	565	591	617	641	661	676	687	692
10	335	372	418	473	535	607	690	792	903	1018	1135	1248	1353	1441	1516	1574	1611	1632	1637
15	338	389	471	583	737	914	1105	1290	1482	1683	1911	2139	2355	2542	2703	2830	2907	2949	2960
20	361	454	591	772	1012	1285	1580	1870	2169	2474	2811	3132	3412	3589	3715	3798	3856	3886	3893
25	336	493	699	956	1282	1644	2028	2421	2805	3164	3474	3734	3938	4049	4107	4124	4107	4077	4050
30	332	513	763	1084	1518	1990	2467	2918	3309	3605	3682	3666	3592	3524	3445	3365	3305	3262	3241
35	309	526	808	1157	1631	2127	2601	2990	3283	3449	3329	3120	2890	2808	2763	2745	2736	2738	2748
40	316	526	814	1180	1729	2276	2741	2893	2918	2850	2720	2571	2439	2447	2488	2537	2526	2510	2499
45	301	542	834	1176	1665	2132	2505	2542	2470	2343	2287	2237	2202	2200	2211	2231	2255	2277	2293
50	248	552	860	1171	1538	1870	2125	2158	2117	2044	2030	2027	2039	2086	2140	2193	2220	2236	2241
55	197	492	772	1037	1307	1546	1736	1815	1851	1863	1894	1926	1961	2016	2073	2124	2156	2176	2185
60	156	438	695	926	1135	1316	1467	1571	1651	1717	1787	1852	1916	1987	2053	2108	2141	2161	2167
65	121	333	536	728	913	1086	1246	1387	1514	1628	1732	1826	1912	1997	2072	2133	2169	2191	2198
70	83.5	183	308	457	644	846	1052	1250	1434	1598	1712	1805	1883	1967	2040	2100	2138	2160	2168
75	50.5	93.4	180	309	506	728	958	1167	1357	1517	1613	1678	1720	1756	1780	1795	1805	1809	1810
80	27.3	56.4	127	240	427	631	829	966	1070	1139	1149	1134	1107	1095	1084	1074	1065	1058	1054
85	17.5	48.8	96.5	160	259	361	451	491	510	513	503	485	466	459	455	453	449	446	445
90	8.74	17.7	32.4	52.9	83.8	117	149	173	191	204	204	202	199	205	212	219	222	223	223
95	6.74	10.2	17.3	28.0	43.5	61.6	81.5	104	125	143	149	153	155	164	172	180	184	186	187
100	5.92	9.43	14.3	20.5	27.9	36.8	47.4	61.6	76.4	90.5	100	109	117	127	135	143	146	148	148
105	5.74	8.61	12.4	17.0	22.9	29.4	36.1	41.6	47.2	53.1	60.4	68.2	76.5	86.0	94.8	102	106	107	107
110	4.86	7.01	10.0	14.0	19.5	25.3	31.0	34.6	37.9	41.1	45.6	50.1	54.4	58.0	60.9	63.0	63.7	63.8	63.5
115	4.05	5.78	8.38	11.8	17.0	22.4	27.5	30.5	33.0	35.4	38.5	41.8	45.0	48.4	51.3	53.6	53.9	53.7	53.2
120	3.58	5.21	7.30	9.83	12.8	16.3	20.1	24.9	29.7	33.9	36.0	37.6	39.0	41.6	44.0	46.1	46.6	46.6	46.3
125	3.24	4.24	5.74	7.74	10.2	13.2	16.8	22.1	27.5	32.4	34.5	35.8	36.7	38.0	39.2	40.0	39.9	39.6	39.2
130	2.97	3.39	4.40	6.00	8.45	11.3	14.4	16.9	19.7	23.0	28.3	33.6	37.9	38.9	38.8	38.1	37.8	37.5	37.4
135	2.65	2.73	3.40	4.65	6.86	9.37	11.9	13.4	15.0	16.8	19.5	22.8	26.9	32.7	38.5	43.7	46.1	47.3	47.0
140	2.37	2.22	2.60	3.50	5.26	7.30	9.38	10.8	12.1	13.5	15.1	16.8	18.4	19.9	21.2	22.3	22.8	23.0	23.0
145	2.09	1.52	1.51	2.06	3.51	5.27	7.10	8.28	9.35	10.4	11.8	13.1	14.4	15.5	16.4	17.1	17.3	17.3	17.2
150	1.84	1.28	1.16	1.48	2.45	3.70	5.06	6.14	7.18	8.17	9.16	10.1	11.0	11.8	12.4	13.0	13.2	13.4	13.3
155	1.60	1.29	1.21	1.36	1.79	2.42	3.21	4.17	5.16	6.14	6.92	7.59	8.13	8.50	8.76	8.91	8.97	8.97	8.94
160	1.45	1.39	1.35	1.34	1.26	1.27	1.45	2.09	2.86	3.67	4.30	4.87	5.36	5.78	6.11	6.35	6.42	6.42	6.39
165	1.32	1.30	1.28	1.25	1.20	1.16	1.13	1.13	1.18	1.32	1.66	2.07	2.48	2.79	3.06	3.27	3.40	3.47	3.51
170	1.25	1.23	1.21	1.18	1.14	1.10	1.06	1.01	0.97	0.92	0.88	0.84	0.80	0.77	0.75	0.74	0.73	0.73	0.75
175	1.31	1.30	1.28	1.27	1.25	1.22	1.20	1.17	1.14	1.11	1.07	1.04	1.01	0.98	0.95	0.93	0.92	0.92	0.94
180	1.41	1.40	1.40	1.39	1.37	1.36	1.34	1.31	1.29	1.26	1.23	1.20	1.17	1.15	1.13	1.12	1.13	1.14	1.17

UNIT: cd																			
C (DEG) y (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	336	336	335	334	333	333	332	332	332	331	331	331	330	330	329	329	329	329	334
5	687	676	661	641	617	591	565	538	512	492	473	454	431	407	385	365	347	331	333
10	1632	1611	1574	1516	1441	1353	1248	1135	1018	903	792	690	607	535	473	418	372	335	274
15	2949	2907	2830	2703	2542	2355	2139	1911	1683	1482	1290	1105	914	737	583	471	389	338	244
20	3886	3856	3798	3715	3589	3412	3132	2811	2474	2169	1870	1580	1285	1012	772	591	454	361	238
25	4077	4107	4124	4107	4049	3938	3734	3474	3164	2805	2421	2028	1644	1282	956	699	493	336	209
30	3262	3305	3365	3445	3524	3592	3666	3682	3605	3309	2918	2467	1990	1518	1084	763	513	332	217
35	2738	2736	2745	2763	2808	2890	3120	3329	3449	3283	2990	2601	2127	1631	1157	808	526	309	240
40	2510	2526	2537	2488	2447	2439	2571	2720	2850	2918	2893	2741	2276	1729	1180	814	526	316	274
45	2277	2255	2231	2211	2200	2202	2237	2287	2343	2470	2542	2505	2132	1665	1176	834	542	301	277
50	2236	2220	2193	2140	2086	2039	2027	2030	2044	2117	2158	2125	1870	1538	1171	860	552	248	244
55	2176	2156	2124	2073	2016	1961	1926	1894	1863	1851	1815	1736	1546	1307	1037	772	492	197	197
60	2161	2141	2108	2053	1987	1916	1852	1787	1717	1651	1571	1467	1316	1135	926	695	438	156	165
65	2191	2169	2133	2072	1997	1912	1826	1732	1628	1514	1387	1246	1086	913	728	536	333	121	129
70	2160	2138	2100	2040	1967	1883	1805	1712	1598	1434	1250	1052	846	644	457	308	183	83.5	82.0
75	1809	1805	1795	1780	1756	1720	1678	1613	1517	1357	1167	958	728	506	309	180	93.4	50.5	46.6
80	1058	1065	1074	1084	1095	1107	1134	1149	1139	1070	966	829	631	427	240	127	56.4	27.3	26.3
85	446	449	453	455	459	466	485	503	513	510	491	451	361	259	160	96.5	48.8	17.5	17.7
90	223	222	219	212	205	199	202	204	204	191	173	149	117	83.8	52.9	32.4	17.7	8.74	8.39
95	186	184	180	172	164	155	153	149	143	125	104	81.5	61.6	43.5	28.0	17.3	10.2	6.74	6.74
100	148	146	143	135	127	117	109	100	90.5	76.4	61.6	47.4	36.8	27.9	20.5	14.3	9.43	5.92	5.72
105	107	106	102	94.8	86.0	76.5	68.2	60.4	53.1	47.2	41.6	36.1	29.4	22.9	17.0	12.4	8.61	5.74	5.67
110	63.8	63.7	63.0	60.9	58.0	54.4	50.1	45.6	41.1	37.9	34.6	31.0	25.3	19.5	14.0	10.0	7.01	4.86	5.09
115	53.7	53.9	53.6	51.3	48.4	45.0	41.8	38.5	35.4	33.0	30.5	27.5	22.4	17.0	11.8	8.38	5.78	4.05	4.79
120	46.6	46.6	46.1	44.0	41.6	39.0	37.6	36.0	33.9	29.7	24.9	20.1	16.3	12.8	9.83	7.30	5.21	3.58	4.10
125	39.6	39.9	40.0	39.2	38.0	36.7	35.8	34.5	32.4	27.5	22.1	16.8	13.2	10.2	7.74	5.74	4.24	3.24	4.92
130	37.5	37.8	38.1	38.8	38.9	37.9	33.6	28.3	23.0	19.7	16.9	14.4	11.3	8.45	6.00	4.40	3.39	2.97	3.51
135	47.3	46.1	43.7	38.5	32.7	26.9	22.8	19.5	16.8	15.0	13.4	11.9	9.37	6.86	4.65	3.40	2.73	2.65	3.19
140	23.0	22.8	22.3	21.2	19.9	18.4	16.8	15.1	13.5	12.1	10.8	9.38	7.30	5.26	3.50	2.60	2.22	2.37	2.63
145	17.3	17.3	17.1	16.4	15.5	14.4	13.1	11.8	10.4	9.35	8.28	7.10	5.27	3.51	2.56	1.51	1.52	2.09	2.20
150	13.4	13.2	13.0	12.1	11.6	11.0	10.1	9.16	8.17	7.18	6.14	5.06	3.70	2.45	1.48	1.16	1.28	1.84	2.00
155	8.97	8.97	8.91	8.76	8.50	8.13	7.59	6.92	6.14	5.16	4.17	3.21	2.42	1.79	1.36	1.21	1.29	1.60	1.80
160	6.42	6.42	6.35	6.11	5.78	5.36	4.87	4.30	3.67	2.86	2.09	1.45	1.27	1.26	1.34	1.35	1.39	1.45	1.73
165	3.47	3.40	3.27	3.06	2.79	2.48	2.07	1.66	1.32	1.18	1.13	1.13	1.16	1.20	1.25	1.28	1.30	1.32	1.53
170	0.73	0.73	0.74	0.75	0.77	0.80	0.84	0.88	0.92	0.97	1.01	1.06	1.10	1.14	1.18	1.21	1.23	1.25	1.37
175	0.92	0.92	0.93	0.95	0.98	1.01	1.04	1.07	1.11	1.14	1.17	1.20	1.22	1.25	1.27	1.28	1.30	1.31	1.36
180	1.14	1.13	1.12	1.12	1.13	1.15	1.17	1.20	1.23	1.26	1.29	1.31	1.34	1.36	1.37	1.39	1.40	1.41	1.41



Table--3

UNIT: cd

C (DEG) y (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	339	341	342	342	342	342	341	341	341	340	340	339	339	338	338	337	337	337	338
5	325	306	270	228	188	161	139	123	114	108	105	102	101	99.4	98.6	98.2	98.2	98.6	98.6
10	222	179	146	121	103	89.1	81.7	80.4	87.1	98.8	114	134	153	171	181	187	190	187	181
15	171	119	88.4	78.6	88.9	130	182	234	267	290	305	304	299	293	304	316	325	316	304
20	154	109	122	161	211	245	274	294	293	282	265	244	223	204	198	196	196	196	198
25	129	97.1	145	216	284	276	252	223	219	218	216	202	187	172	164	159	158	159	164
30	146	119	168	236	300	291	262	225	199	175	154	139	127	119	112	108	107	108	112
35	192	167	179	201	222	208	186	159	136	115	97.9	90.8	87.7	87.0	84.8	83.4	82.7	83.4	84.8
40	244	224	226	230	230	197	157	118	96.6	80.9	68.9	56.5	46.5	39.4	37.2	37.2	38.4	37.2	37.2
45	253	230	209	188	166	139	111	86.1	66.6	50.6	37.7	28.6	22.3	18.1	15.5	14.4	14.4	14.4	15.5
50	233	216	189	159	127	99.5	74.1	52.0	36.1	24.0	15.5	10.4	7.54	6.34	5.31	4.97	5.11	4.97	5.31
55	190	175	149	119	87.8	64.4	44.6	28.8	19.5	13.7	10.2	6.85	4.55	3.17	2.57	2.48	2.71	2.48	2.57
60	163	152	124	91.4	59.2	41.0	27.7	18.6	12.6	8.95	6.88	4.51	2.80	1.69	1.28	1.24	1.43	1.24	1.28
65	127	117	90.1	59.8	31.4	20.8	15.6	13.5	9.91	7.14	5.02	3.12	1.68	0.71	0.37	0.36	0.52	0.36	0.37
70	77.1	68.7	53.5	37.3	22.4	16.0	12.2	10.2	7.57	5.45	3.76	2.26	1.11	0.32	0.10	0.14	0.31	0.14	0.10
75	41.9	36.5	29.3	22.0	15.4	11.8	9.30	7.54	5.80	4.39	3.22	2.09	1.17	0.52	0.35	0.38	0.51	0.38	0.35
80	24.6	22.3	18.8	15.1	11.6	9.40	7.65	6.26	4.99	3.92	3.01	2.10	1.35	0.81	0.67	0.70	0.81	0.70	0.67
85	17.2	16.1	13.8	11.2	8.64	7.18	6.04	5.12	4.19	3.36	2.65	2.00	1.49	1.12	1.02	1.04	1.12	1.04	1.02
90	7.95	7.43	6.76	6.05	5.35	4.81	4.31	3.82	3.24	2.69	2.19	1.85	1.59	1.43	1.39	1.41	1.45	1.41	1.39
95	6.56	6.22	5.59	4.88	4.18	3.73	3.35	3.01	2.62	2.26	1.97	1.81	1.72	1.67	1.67	1.68	1.70	1.68	1.67
100	5.48	5.21	4.89	4.53	4.13	3.66	3.18	2.74	2.42	2.17	1.98	1.89	1.85	1.85	1.85	1.87	1.89	1.87	1.85
105	5.48	5.17	4.65	4.08	3.53	3.19	2.92	2.68	2.43	2.21	2.05	1.98	1.96	1.96	1.97	1.99	2.00	1.99	1.97
110	5.12	4.97	4.50	3.93	3.36	3.05	2.81	2.61	2.39	2.19	2.04	1.98	1.96	1.97	1.97	1.98	1.99	1.98	1.97
115	5.18	5.22	4.67	3.94	3.20	2.91	2.73	2.60	2.39	2.20	2.05	1.98	1.96	1.96	1.96	1.97	1.97	1.97	1.96
120	5.70	5.91	5.18	4.16	3.12	2.80	2.65	2.59	2.40	2.23	2.09	2.02	1.99	1.98	1.97	1.97	1.97	1.97	1.97
125	4.61	4.76	4.34	3.73	3.09	2.86	2.72	2.63	2.47	2.34	2.22	2.17	2.14	2.13	2.12	2.11	2.11	2.11	2.12
130	3.84	3.95	3.74	3.41	3.05	2.88	2.76	2.66	2.54	2.45	2.37	2.35	2.34	2.34	2.34	2.33	2.32	2.33	2.34
135	3.54	3.69	3.54	3.28	2.98	2.82	2.70	2.60	2.52	2.46	2.42	2.43	2.45	2.47	2.48	2.48	2.47	2.48	2.48
140	2.79	2.88	2.86	2.79	2.69	2.61	2.53	2.46	2.41	2.38	2.38	2.40	2.44	2.48	2.50	2.51	2.51	2.51	2.50
145	2.41	2.49	2.50	2.47	2.42	2.37	2.32	2.27	2.26	2.26	2.28	2.32	2.37	2.42	2.44	2.45	2.45	2.45	2.44
150	2.22	2.31	2.32	2.29	2.24	2.20	2.16	2.13	2.14	2.16	2.19	2.23	2.26	2.29	2.31	2.32	2.32	2.32	2.31
155	2.05	2.16	2.15	2.10	2.03	2.01	1.99	1.99	2.00	2.02	2.05	2.06	2.07	2.07	2.08	2.07	2.06	2.07	2.08
160	1.89	2.01	2.01	1.96	1.90	1.90	1.91	1.92	1.93	1.93	1.93	1.92	1.90	1.87	1.84	1.81	1.78	1.81	1.84
165	1.68	1.78	1.79	1.77	1.74	1.75	1.77	1.78	1.76	1.74	1.70	1.65	1.60	1.55	1.51	1.47	1.43	1.47	1.51
170	1.46	1.52	1.53	1.51	1.49	1.50	1.50	1.49	1.44	1.38	1.30	1.22	1.14	1.07	1.03	1.01	1.01	1.01	1.03
175	1.42	1.45	1.46	1.45	1.43	1.42	1.40	1.38	1.31	1.24	1.17	1.11	1.07	1.04	1.04	1.04	1.05	1.04	1.04
180	1.32	1.29	1.28	1.28	1.29	1.30	1.31	1.32	1.31	1.29	1.26	1.23	1.19	1.15	1.13	1.12	1.12	1.12	1.13

																UNIT: cd			
C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	338	339	339	340	340	341	341	341	342	342	342	342	341	339	334				
5	99.4	101	102	105	108	114	123	139	161	188	228	270	306	325	333				
10	171	153	134	114	98.8	87.1	80.4	81.7	89.1	103	121	146	179	222	274				
15	293	299	304	305	290	267	234	182	130	88.9	78.6	88.4	119	171	244				
20	204	223	244	265	282	293	294	274	245	211	161	122	109	154	238				
25	172	187	202	216	218	219	223	252	276	284	216	145	97.1	129	209				
30	119	127	139	154	175	199	225	262	291	300	236	168	119	146	217				
35	87.0	87.7	90.8	97.9	115	136	159	186	208	222	201	179	167	192	240				
40	39.4	46.5	56.5	68.9	80.9	96.6	118	157	197	230	230	226	224	244	274				
45	18.1	22.3	28.6	37.7	50.6	66.6	86.1	111	139	166	188	209	230	253	277				
50	6.34	7.54	10.4	15.5	24.0	36.1	52.0	74.1	99.5	127	159	189	216	233	244				
55	3.17	4.55	6.85	10.2	13.7	19.5	28.8	44.6	64.4	87.8	119	149	175	190	197				
60	1.69	2.80	4.51	6.88	8.95	12.6	18.6	27.7	41.0	59.2	91.4	124	152	163	165				
65	0.71	1.68	3.12	5.02	7.14	9.91	13.5	15.6	20.8	31.4	59.8	90.1	117	127	129				
70	0.32	1.11	2.26	3.76	5.45	7.57	10.2	12.2	16.0	22.4	37.3	53.5	68.7	77.1	82.0				
75	0.52	1.17	2.09	3.22	4.39	5.80	7.54	9.30	11.8	15.4	22.0	29.3	36.5	41.9	46.6				
80	0.81	1.35	2.10	3.01	3.92	4.99	6.26	7.65	9.40	11.6	15.1	18.8	22.3	24.6	26.3				
85	1.12	1.49	2.00	2.65	3.36	4.19	5.12	6.04	7.18	8.64	11.2	13.8	16.1	17.2	17.7				
90	1.43	1.59	1.85	2.19	2.69	3.24	3.82	4.31	4.81	5.35	6.05	6.76	7.43	7.95	8.39				
95	1.67	1.72	1.81	1.97	2.26	2.62	3.01	3.35	3.73	4.18	4.88	5.59	6.22	6.56	6.74				
100	1.85	1.85	1.89	1.98	2.17	2.42	2.74	3.18	3.66	4.13	4.53	4.89	5.21	5.48	5.72				
105	1.96	1.96	1.98	2.05	2.21	2.43	2.68	2.92	3.19	3.53	4.08	4.65	5.17	5.48	5.67				
110	1.97	1.96	1.98	2.04	2.19	2.39	2.61	2.81	3.05	3.36	3.93	4.50	4.97	5.12	5.09				
115	1.96	1.96	1.98	2.05	2.20	2.39	2.60	2.73	2.91	3.20	3.94	4.67	5.22	5.18	4.79				
120	1.98	1.99	2.02	2.09	2.23	2.40	2.59	2.65	2.80	3.12	4.16	5.18	5.91	5.70	4.92				
125	2.13	2.14	2.17	2.22	2.34	2.47	2.63	2.72	2.86	3.09	3.73	4.34	4.76	4.61	4.10				
130	2.34	2.34	2.35	2.37	2.45	2.54	2.66	2.76	2.88	3.05	3.41	3.74	3.95	3.84	3.51				
135	2.47	2.45	2.43	2.42	2.46	2.52	2.60	2.70	2.82	2.98	3.28	3.54	3.69	3.54	3.19				
140	2.48	2.44	2.40	2.38	2.38	2.41	2.46	2.53	2.61	2.69	2.79	2.86	2.88	2.79	2.62				
145	2.42	2.37	2.32	2.28	2.26	2.26	2.27	2.32	2.37	2.42	2.47	2.50	2.49	2.41	2.28				
150	2.29	2.26	2.23	2.19	2.16	2.14	2.13	2.16	2.20	2.24	2.29	2.32	2.31	2.22	2.06				
155	2.07	2.07	2.06	2.05	2.02	2.00	1.99	1.99	2.01	2.03	2.10	2.15	2.16	2.05	1.86				
160	1.87	1.90	1.92	1.93	1.93	1.93	1.92	1.91	1.90	1.90	1.96	2.01	2.01	1.89	1.71				
165	1.55	1.60	1.65	1.70	1.74	1.76	1.78	1.77	1.75	1.74	1.77	1.79	1.78	1.68	1.53				
170	1.07	1.14	1.22	1.30	1.38	1.44	1.49	1.50	1.50	1.49	1.51	1.53	1.52	1.46	1.37				
175	1.04	1.07	1.11	1.17	1.24	1.31	1.38	1.40	1.42	1.43	1.45	1.46	1.45	1.42	1.38				
180	1.15	1.19	1.23	1.26	1.29	1.31	1.32	1.31	1.30	1.29	1.28	1.28	1.29	1.32	1.36				

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

<b>Model No.</b>	W34S @ 35W / 3000K	<b>Sample ID</b>	230612003-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	0.328	39.1	0.995	2.87
277.0	60	0.152	39.0	0.924	6.02



## 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\*\*\*\*\*