

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77-2017

Prepared For

RAB Lighting Inc.

Prepared By

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Issue Date: 2023-06-13

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		15866
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		149.5
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		15300
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	144.2
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		106.1
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	3.64
			277V	11.94
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
			277V	0.899
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3045±175	3073
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		72.4
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-34
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		93
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%		7.6%
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		0.889
(Goniophotometer – Section 4.2)		Non-Worst Case		0.412
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		106.1
(Goniophotometer – Section 4.2)		Non-Worst Case		102.5

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-12	W34L @ 100W / 3000K	230612001-S1
2	Goniophotometer Test	2023-06-12	W34L @ 100W / 3000K	230612001-S1
3	THD and PF Test	2023-06-12	W34L @ 100W / 3000K	230612001-S1

Remark (If any)

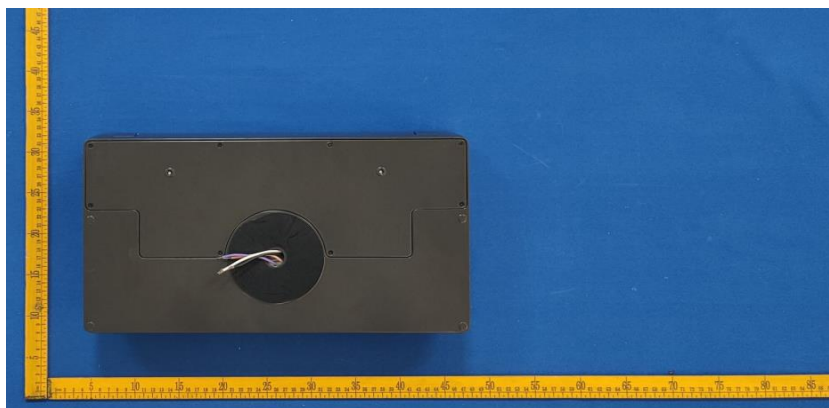
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34L @ 100W / 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

Model No.	W34L @ 100W / 3000K	Sample ID	230612001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

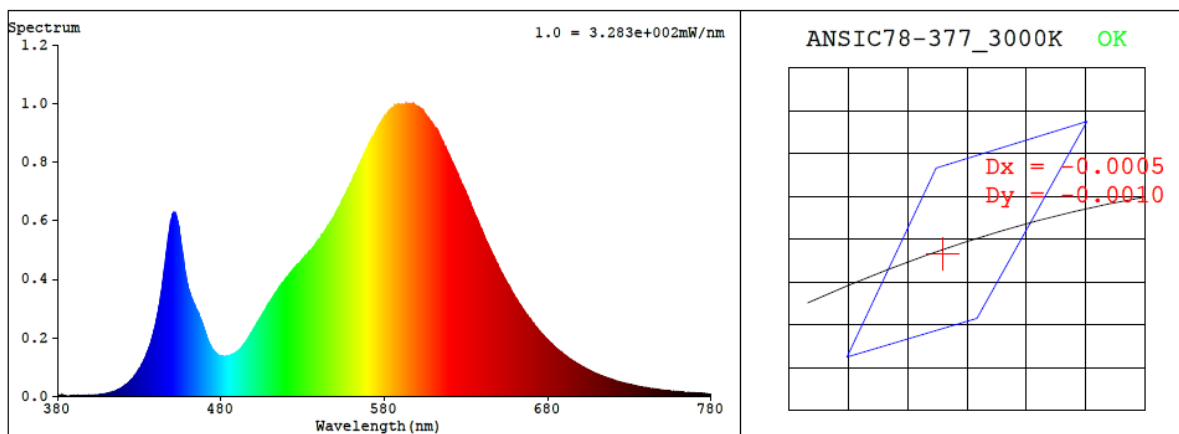
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780nm.</p>

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.889	106.1	0.995
277.0	60	0.412	102.5	0.899

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3073	72.4	-34	-0.0003	76	93	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4314$ $y = 0.4013$ / $u' = 0.2482$ $v' = 0.5195$ ($duv = -3.23e-04$)

CCT= 3073K Prcp WL: Ld=582.6nm Purity=49.9%

Peak WL: Lp=598nm FWHM: =110.2nm Ratio: R=20.8% G=77.0% B=2.1%

Render Index: Ra = 72.4 AvgR = 63.5 TM30: Rf=75 Rg=93

EEI: 0.09012 A++ Highest

R1 =69 R2 =84 R3 =94 R4 =67 R5 =68 R6 =78 R7 =77

R8 =43 R9 =-34 R10=63 R11=62 R12=52 R13=72 R14=97 R15=61

4.1 Integrating Sphere Test

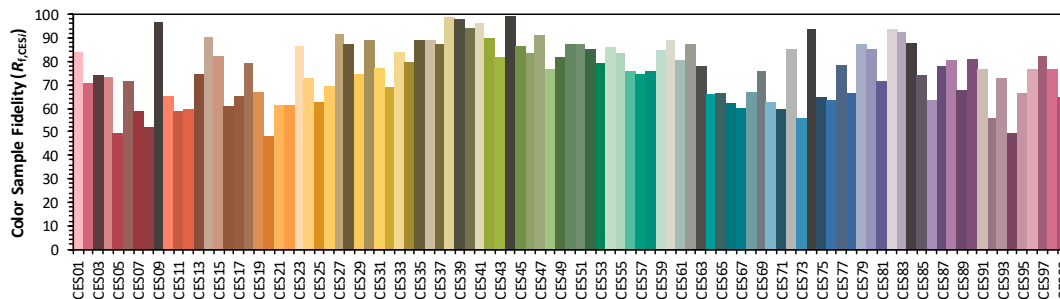
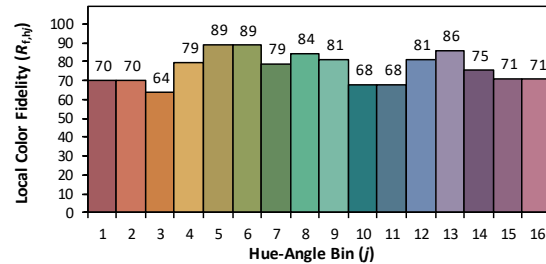
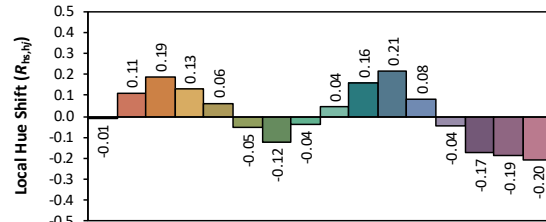
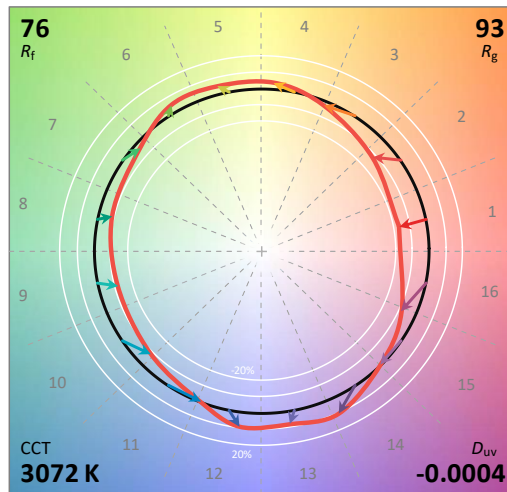
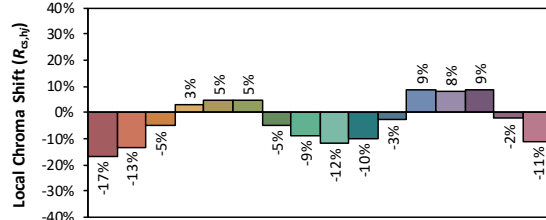
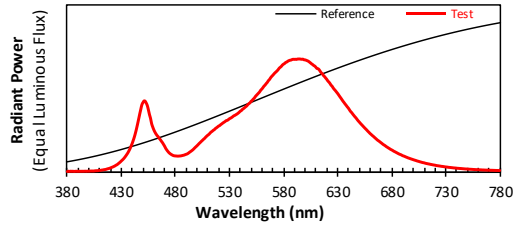
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/13

Model: W34L @ 100W / 3000K



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

x 0.4314
 y 0.4012
 u' 0.2482
 v' 0.5194

CIE 13.3-1995
(CRI)

R_a 72
 R_g -34

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	0.00E+00	447	5.11E-04	514	3.57E-04	581	9.59E-04	648	4.64E-04	715	6.61E-05
381	2.80E-06	448	5.53E-04	515	3.66E-04	582	9.68E-04	649	4.51E-04	716	6.36E-05
382	5.00E-07	449	5.93E-04	516	3.72E-04	583	9.72E-04	650	4.41E-04	717	6.18E-05
383	2.80E-06	450	6.12E-04	517	3.82E-04	584	9.79E-04	651	4.30E-04	718	5.98E-05
384	1.80E-06	451	6.26E-04	518	3.88E-04	585	9.84E-04	652	4.19E-04	719	5.81E-05
385	2.30E-06	452	6.24E-04	519	3.96E-04	586	9.88E-04	653	4.09E-04	720	5.64E-05
386	1.20E-06	453	6.08E-04	520	4.04E-04	587	9.90E-04	654	3.99E-04	721	5.44E-05
387	1.30E-06	454	5.86E-04	521	4.09E-04	588	9.94E-04	655	3.88E-04	722	5.23E-05
388	2.50E-06	455	5.48E-04	522	4.17E-04	589	9.96E-04	656	3.79E-04	723	5.11E-05
389	2.00E-06	456	5.06E-04	523	4.24E-04	590	9.96E-04	657	3.69E-04	724	4.95E-05
390	1.70E-06	457	4.72E-04	524	4.32E-04	591	9.97E-04	658	3.58E-04	725	4.81E-05
391	2.10E-06	458	4.25E-04	525	4.38E-04	592	9.95E-04	659	3.49E-04	726	4.61E-05
392	2.00E-06	459	3.96E-04	526	4.44E-04	593	9.98E-04	660	3.39E-04	727	4.53E-05
393	2.10E-06	460	3.71E-04	527	4.52E-04	594	9.99E-04	661	3.30E-04	728	4.38E-05
394	2.20E-06	461	3.51E-04	528	4.54E-04	595	9.99E-04	662	3.21E-04	729	4.23E-05
395	2.10E-06	462	3.34E-04	529	4.61E-04	596	9.98E-04	663	3.13E-04	730	4.06E-05
396	2.70E-06	463	3.20E-04	530	4.69E-04	597	9.96E-04	664	3.05E-04	731	3.99E-05
397	2.80E-06	464	3.10E-04	531	4.74E-04	598	9.97E-04	665	2.96E-04	732	3.84E-05
398	2.30E-06	465	2.95E-04	532	4.79E-04	599	9.92E-04	666	2.88E-04	733	3.69E-05
399	3.60E-06	466	2.84E-04	533	4.87E-04	600	9.91E-04	667	2.79E-04	734	3.62E-05
400	2.80E-06	467	2.70E-04	534	4.94E-04	601	9.88E-04	668	2.72E-04	735	3.50E-05
401	3.90E-06	468	2.57E-04	535	4.99E-04	602	9.84E-04	669	2.65E-04	736	3.40E-05
402	4.40E-06	469	2.41E-04	536	5.05E-04	603	9.79E-04	670	2.57E-04	737	3.28E-05
403	4.70E-06	470	2.25E-04	537	5.10E-04	604	9.72E-04	671	2.50E-04	738	3.17E-05
404	4.20E-06	471	2.06E-04	538	5.18E-04	605	9.64E-04	672	2.42E-04	739	3.11E-05
405	5.30E-06	472	1.92E-04	539	5.26E-04	606	9.56E-04	673	2.36E-04	740	2.99E-05
406	6.70E-06	473	1.79E-04	540	5.35E-04	607	9.49E-04	674	2.30E-04	741	2.87E-05
407	7.40E-06	474	1.68E-04	541	5.41E-04	608	9.41E-04	675	2.22E-04	742	2.81E-05
408	7.50E-06	475	1.59E-04	542	5.52E-04	609	9.36E-04	676	2.16E-04	743	2.71E-05
409	9.00E-06	476	1.53E-04	543	5.58E-04	610	9.25E-04	677	2.10E-04	744	2.67E-05
410	1.02E-05	477	1.47E-04	544	5.67E-04	611	9.15E-04	678	2.04E-04	745	2.57E-05
411	1.07E-05	478	1.42E-04	545	5.75E-04	612	9.13E-04	679	1.97E-04	746	2.47E-05
412	1.31E-05	479	1.40E-04	546	5.82E-04	613	9.04E-04	680	1.92E-04	747	2.40E-05
413	1.41E-05	480	1.38E-04	547	5.94E-04	614	8.89E-04	681	1.87E-04	748	2.29E-05
414	1.64E-05	481	1.38E-04	548	6.02E-04	615	8.76E-04	682	1.81E-04	749	2.26E-05
415	1.77E-05	482	1.37E-04	549	6.10E-04	616	8.67E-04	683	1.76E-04	750	2.18E-05
416	2.00E-05	483	1.37E-04	550	6.23E-04	617	8.52E-04	684	1.71E-04	751	2.10E-05
417	2.33E-05	484	1.38E-04	551	6.31E-04	618	8.43E-04	685	1.66E-04	752	2.05E-05
418	2.58E-05	485	1.39E-04	552	6.43E-04	619	8.30E-04	686	1.60E-04	753	1.99E-05
419	2.84E-05	486	1.41E-04	553	6.52E-04	620	8.19E-04	687	1.55E-04	754	1.95E-05
420	3.22E-05	487	1.43E-04	554	6.66E-04	621	8.05E-04	688	1.51E-04	755	1.87E-05
421	3.63E-05	488	1.46E-04	555	6.77E-04	622	7.94E-04	689	1.48E-04	756	1.80E-05
422	4.01E-05	489	1.50E-04	556	6.87E-04	623	7.82E-04	690	1.42E-04	757	1.76E-05
423	4.48E-05	490	1.53E-04	557	6.97E-04	624	7.67E-04	691	1.38E-04	758	1.68E-05
424	4.95E-05	491	1.57E-04	558	7.08E-04	625	7.57E-04	692	1.35E-04	759	1.65E-05
425	5.59E-05	492	1.63E-04	559	7.23E-04	626	7.42E-04	693	1.30E-04	760	1.63E-05
426	6.08E-05	493	1.70E-04	560	7.32E-04	627	7.29E-04	694	1.26E-04	761	1.56E-05
427	6.84E-05	494	1.77E-04	561	7.45E-04	628	7.19E-04	695	1.22E-04	762	1.50E-05
428	7.65E-05	495	1.84E-04	562	7.58E-04	629	7.06E-04	696	1.19E-04	763	1.47E-05
429	8.44E-05	496	1.92E-04	563	7.68E-04	630	6.94E-04	697	1.15E-04	764	1.38E-05
430	9.40E-05	497	2.01E-04	564	7.81E-04	631	6.81E-04	698	1.12E-04	765	1.38E-05
431	1.03E-04	498	2.11E-04	565	7.91E-04	632	6.67E-04	699	1.09E-04	766	1.31E-05
432	1.13E-04	499	2.20E-04	566	8.06E-04	633	6.53E-04	700	1.05E-04	767	1.28E-05
433	1.24E-04	500	2.29E-04	567	8.16E-04	634	6.39E-04	701	1.02E-04	768	1.24E-05
434	1.37E-04	501	2.39E-04	568	8.31E-04	635	6.25E-04	702	9.93E-05	769	1.18E-05
435	1.51E-04	502	2.49E-04	569	8.43E-04	636	6.13E-04	703	9.60E-05	770	1.17E-05
436	1.66E-04	503	2.58E-04	570	8.53E-04	637	5.99E-04	704	9.27E-05	771	1.14E-05
437	1.84E-04	504	2.68E-04	571	8.64E-04	638	5.88E-04	705	9.02E-05	772	1.11E-05
438	2.03E-04	505	2.77E-04	572	8.75E-04	639	5.74E-04	706	8.71E-05	773	1.09E-05
439	2.26E-04	506	2.86E-04	573	8.84E-04	640	5.63E-04	707	8.44E-05	774	1.06E-05
440	2.49E-04	507	2.94E-04	574	8.93E-04	641	5.48E-04	708	8.16E-05	775	1.01E-05
441	2.76E-04	508	3.05E-04	575	9.04E-04	642	5.34E-04	709	7.90E-05	776	9.80E-06
442	3.06E-04	509	3.14E-04	576	9.17E-04	643	5.24E-04	710	7.75E-05	777	9.40E-06
443	3.41E-04	510	3.23E-04	577	9.25E-04	644	5.11E-04	711	7.43E-05	778	9.40E-06
444	3.79E-04	511	3.30E-04	578	9.33E-04	645	4.99E-04	712	7.18E-05	779	9.00E-06
445	4.21E-04	512	3.41E-04	579	9.45E-04	646	4.87E-04	713	6.99E-05	780	9.00E-06
446	4.65E-04	513	3.51E-04	580	9.53E-04	647	4.76E-04	714	6.78E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34L @ 100W / 3000K	Sample ID	230612001-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	42.1

Test Method
<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 $25 \pm 1^{\circ}\text{C}$, 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 ± 0.2 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 1.0° vertical intervals and 15° horizontal intervals.</p>

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.889	106.1	0.995
NON-WORST CASE	277.0	60	0.412	102.5	0.899

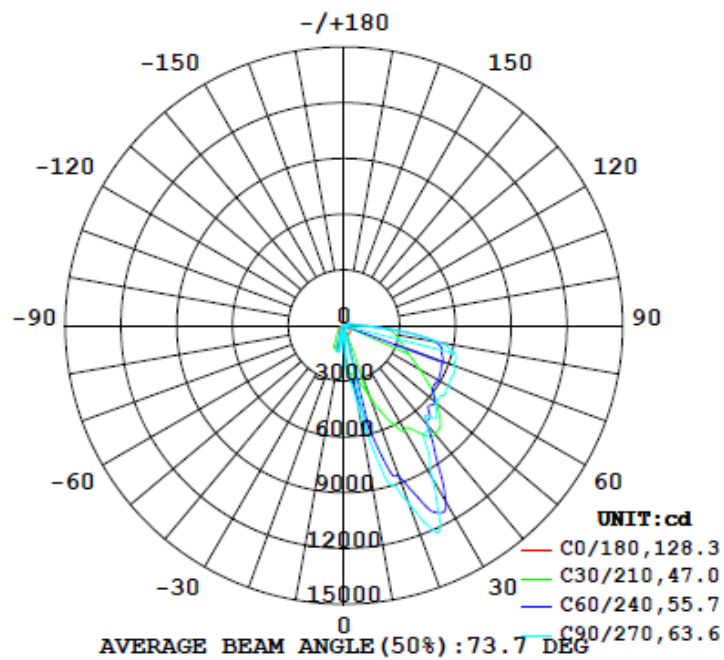
Test Result

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			
0°-180° zones	15866	103.7	133.4	63.2	83.5	149.5	7.3%	B1-U3-G5
0°-90° zones	15300	103.7	133.4	63.2	83.5	144.2	7.6%	B1-U3-G5

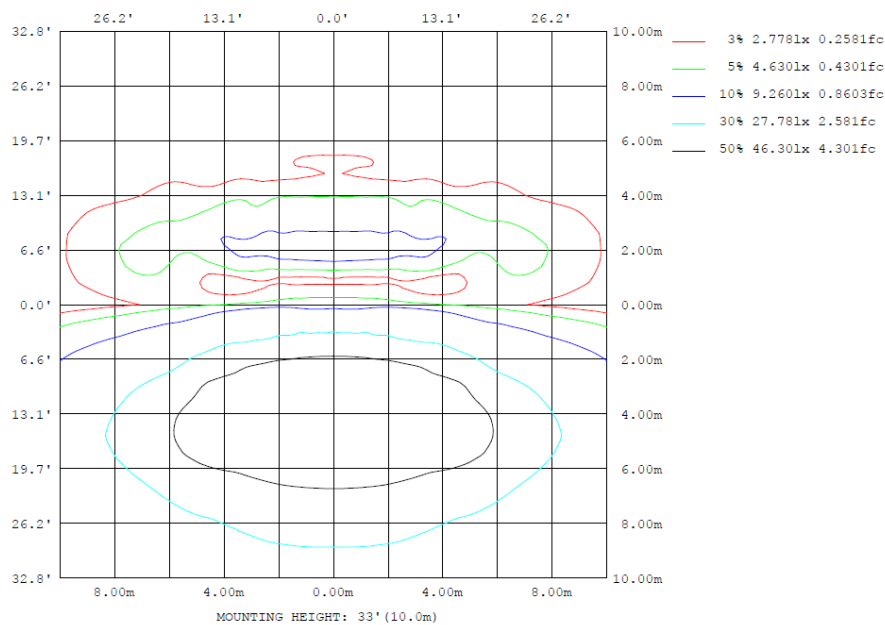
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

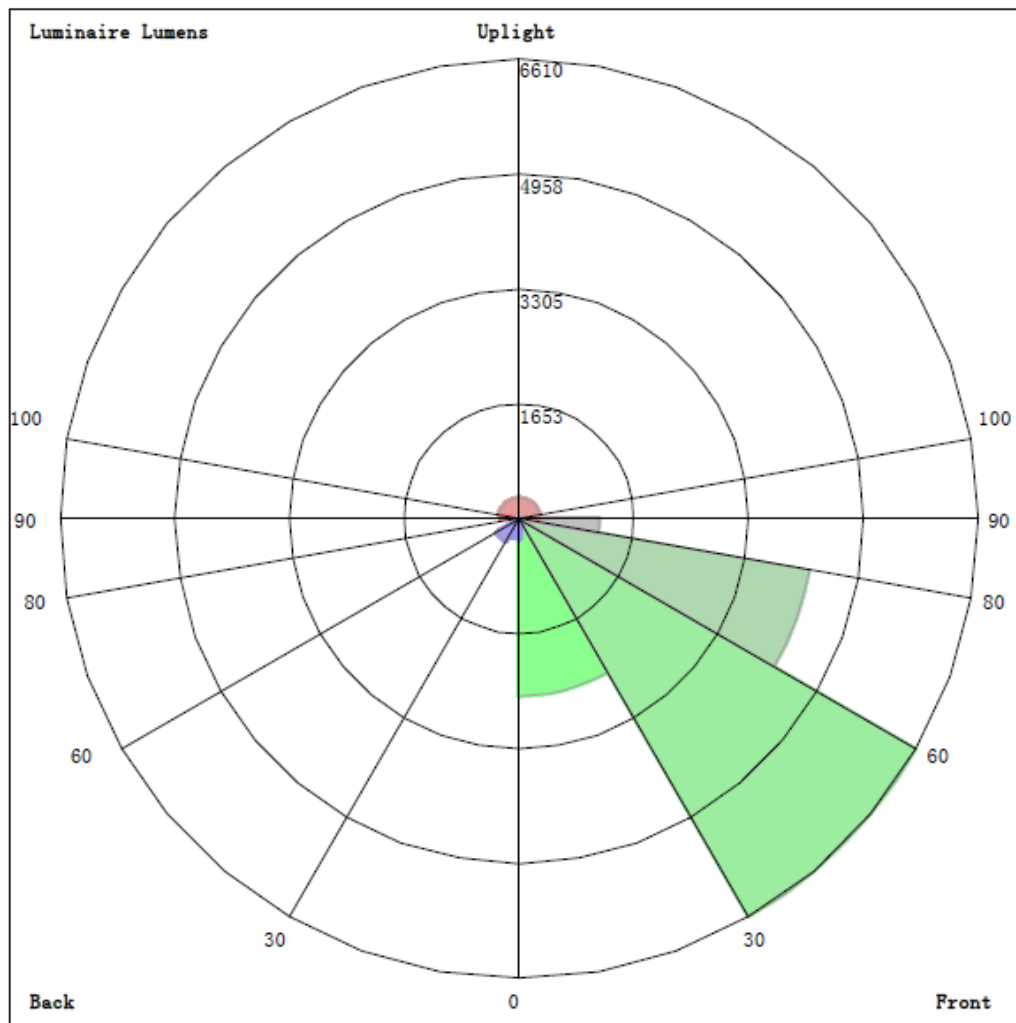
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	zone	total	lum, lamp
10	57.30	312.3	437.8	312.3	57.30	41.86	124.6	41.86	0- 10	132.5	132.5	0.84, 0.84
20	58.07	710.7	1017	710.7	58.07	120.8	72.70	120.8	10- 20	825.9	958.4	6.04, 6.04
30	53.92	1024	953.7	1024	53.92	51.57	39.48	51.57	20- 30	1875	2833	17.9, 17.9
40	49.63	849.2	705.3	849.2	49.63	40.52	12.40	40.52	30- 40	2316	5149	32.5, 32.5
50	41.35	589.2	645.3	589.2	41.35	15.55	2.157	15.55	40- 50	2358	7507	47.3, 47.3
60	32.85	512.7	648.0	512.7	32.85	5.407	0.4999	5.407	50- 60	2314	9821	61.9, 61.9
70	22.97	478.7	633.7	478.7	22.97	2.380	0.1438	2.380	60- 70	2236	12056	76, 76
80	9.781	431.7	521.3	431.7	9.781	1.829	0.3365	1.829	70- 80	2080	14137	89.1, 89.1
90	2.443	100.6	104.3	100.6	2.443	1.316	0.5148	1.316	80- 90	1163	15300	96.4, 96.4
100	1.946	36.85	50.32	36.85	1.946	0.8875	0.6136	0.8875	90-100	267.9	15568	98.1, 98.1
110	1.412	16.31	23.52	16.31	1.412	0.8176	0.6340	0.8176	100-110	127.1	15695	98.9, 98.9
120	0.9565	13.17	15.77	13.17	0.9565	0.7670	0.6140	0.7670	110-120	67.31	15762	99.3, 99.3
130	0.7432	8.367	15.22	8.367	0.7432	0.7498	0.6849	0.7498	120-130	47.06	15809	99.6, 99.6
140	0.6161	5.534	9.160	5.534	0.6161	0.6759	0.7138	0.6759	130-140	31.22	15840	99.8, 99.8
150	0.4876	3.699	5.925	3.699	0.4876	0.5886	0.6539	0.5886	140-150	15.63	15856	99.9, 99.9
160	0.3987	2.287	3.302	2.287	0.3987	0.5542	0.4961	0.5542	150-160	7.540	15864	100, 100
170	0.3456	0.2542	0.8573	0.2542	0.3456	0.4385	0.2905	0.4385	160-170	2.450	15866	100, 100
180	0.3933	0.3562	0.3353	0.3562	0.3933	0.3809	0.2108	0.3809	170-180	0.3237	15866	100, 100
DEG	LUMINOUS INTENSITY: ×10cd								UNIT: lm			

Zonal (lm)	Total (lm)	Percent
0-10	132.50	0.84%
10-20	825.92	6.04%
20-30	1874.81	17.86%
30-40	2316.22	32.46%
40-50	2357.51	47.31%
50-60	2313.70	61.90%
60-70	2235.75	75.99%
70-80	2080.42	89.10%
80-90	1163.04	96.43%
90-100	267.90	98.12%
100-110	127.13	98.92%
110-120	67.31	99.35%
120-130	47.06	99.64%
130-140	31.22	99.84%
140-150	15.63	99.94%
150-160	7.54	99.98%
160-170	2.45	100.00%
170-180	0.32	100.00%

4.2 Goniophotometer Test

LCS/BUG

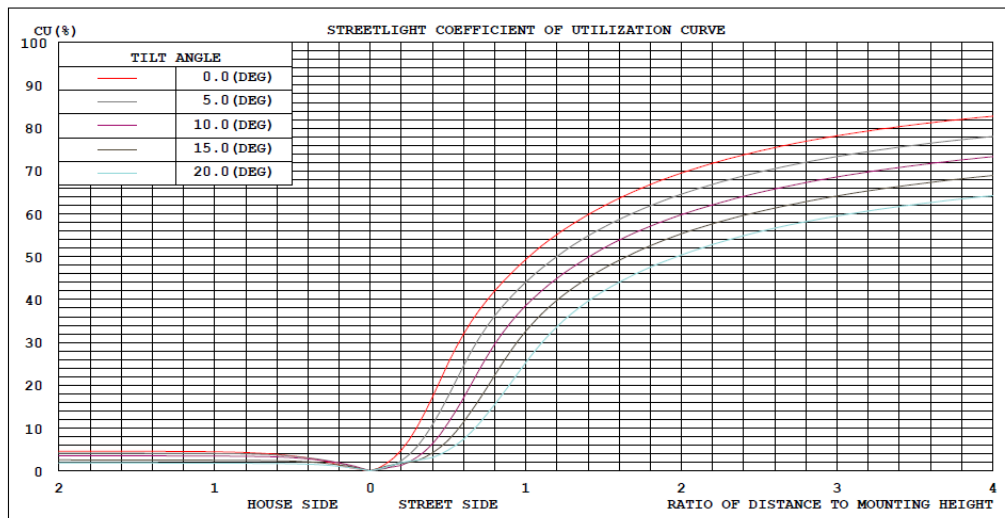


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

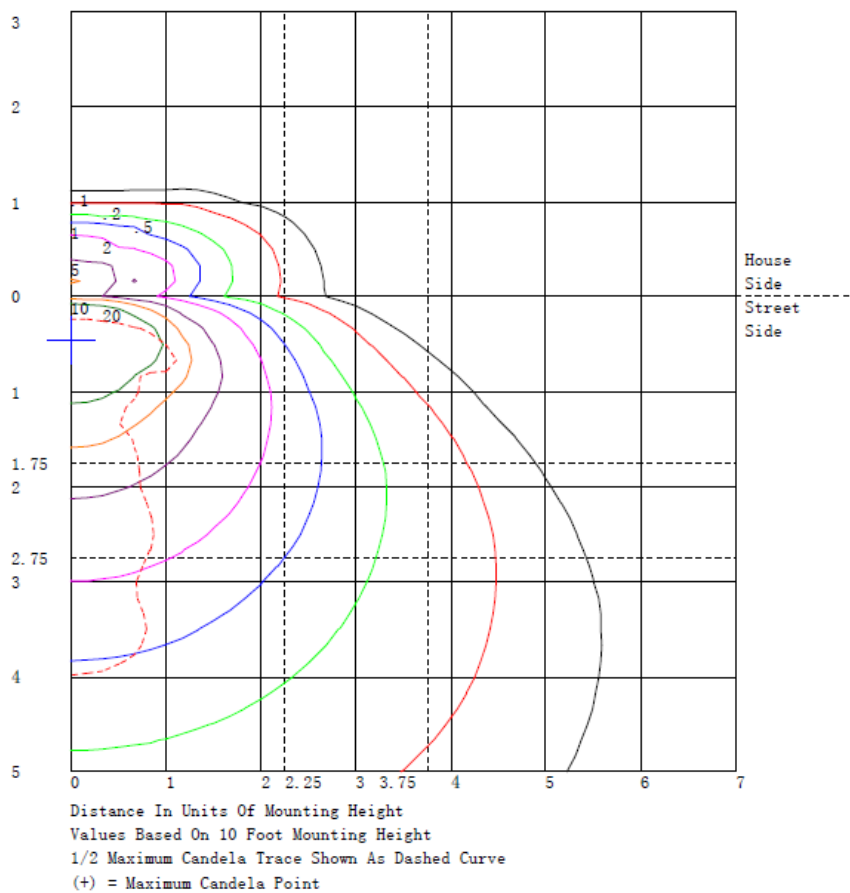
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	2547.8	N.A.	16.1
FM - Front-Medium (30-60)	6610.4	N.A.	41.7
FH - Front-High (60-80)	4245.1	N.A.	26.8
FVH - Front-Very High (80-90)	1151.8	N.A.	7.3
BL - Back-Low (0-30)	285.5	N.A.	1.8
BM - Back-Medium (30-60)	377.0	N.A.	2.4
BH - Back-High (60-80)	71.0	N.A.	0.4
BVH - Back-Very High (80-90)	11.3	N.A.	0.1
UL - Uplight-Low (90-100)	267.9	N.A.	1.7
UH - Uplight-High (100-180)	298.7	N.A.	1.9
Total	15866.5	N.A.	100.0
BUG Rating	B1-U3-G5		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: ×10cd

C (DEG) γ (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	57.1	57.3	57.4	57.6	57.8	57.9	58.1	58.3	58.5	58.7	59.0	59.2	59.5	59.7	59.9	60.1	60.4	60.6	60.9
5	57.4	69.1	86.0	108	140	173	206	229	248	260	264	263	260	259	258	257	259	261	263
10	57.3	121	173	214	239	255	268	283	298	312	327	341	357	377	397	415	427	435	438
15	57.9	142	210	261	284	299	315	358	409	466	529	592	652	702	745	780	805	822	828
20	58.1	139	210	273	315	357	409	506	611	711	772	822	863	909	949	981	1002	1013	1017
25	56.8	127	202	282	370	462	555	645	736	827	925	1018	1098	1150	1186	1208	1220	1222	1219
30	53.9	119	197	290	402	525	652	790	918	1024	1075	1097	1096	1072	1038	1001	978	962	954
35	51.3	127	215	318	443	575	705	833	938	1007	982	928	863	836	816	800	781	766	759
40	49.6	132	229	340	488	634	760	822	851	849	805	749	697	694	703	716	714	710	705
45	46.3	138	239	349	495	630	736	740	713	671	657	647	644	654	669	685	694	700	702
50	41.3	115	200	296	428	553	650	650	623	589	601	620	640	644	644	643	644	645	645
55	36.6	118	202	288	391	485	560	576	573	561	566	574	584	599	615	630	642	651	655
60	32.9	104	176	248	331	407	470	494	505	513	537	563	587	606	621	633	641	646	648
65	27.8	83.2	141	201	270	336	397	437	470	497	526	552	576	596	612	626	635	642	644
70	23.0	57.9	100	150	213	280	344	395	439	479	513	543	568	590	606	619	628	633	634
75	17.0	37.9	70.1	114	176	244	312	368	417	459	493	522	546	570	589	605	615	620	621
80	9.78	22.5	48.2	86.8	146	213	280	338	389	432	461	483	499	509	516	519	521	522	521
85	4.93	13.8	34.0	65.6	119	176	229	255	271	279	282	280	277	274	272	270	268	267	265
90	2.44	9.66	20.0	33.4	53.8	74.3	92.2	98.4	101	101	102	103	104	104	105	105	105	105	104
95	1.89	5.46	10.1	15.9	24.0	32.3	39.9	44.4	47.7	50.3	53.2	55.8	58.0	59.6	60.9	61.8	62.4	62.6	62.6
100	1.95	4.27	7.11	10.5	14.5	18.9	23.5	28.2	32.7	36.8	40.3	43.3	45.8	47.5	48.7	49.6	50.1	50.3	50.3
105	1.63	3.38	5.38	7.62	10.3	13.1	15.8	17.7	19.7	21.8	24.9	28.1	31.3	34.3	37.0	39.1	39.9	40.2	40.0
110	1.41	2.79	4.34	6.06	8.13	10.2	12.3	13.7	15.0	16.3	18.0	19.7	21.2	22.2	23.0	23.5	23.7	23.6	23.5
115	1.20	2.21	3.43	4.83	6.63	8.47	10.2	11.5	12.5	13.5	14.5	15.4	16.4	17.6	18.8	19.7	20.0	20.0	19.8
120	0.96	1.78	2.76	3.89	5.22	6.67	8.22	10.0	11.7	13.2	13.6	13.8	14.0	14.6	15.2	15.7	15.9	15.8	15.8
125	0.83	1.46	2.23	3.15	4.23	5.44	6.77	8.35	9.93	11.4	12.6	13.6	14.3	14.6	14.6	14.5	14.4	14.2	14.1
130	0.74	1.26	1.90	2.66	3.61	4.62	5.65	6.44	7.31	8.37	10.2	12.0	13.7	14.8	15.5	15.9	15.8	15.5	15.2
135	0.68	1.11	1.65	2.27	3.07	3.91	4.73	5.35	5.97	6.63	7.48	8.43	9.47	10.7	12.0	13.1	13.8	14.2	14.3
140	0.62	0.92	1.32	1.81	2.46	3.15	3.85	4.43	4.99	5.53	6.11	6.68	7.24	7.80	8.31	8.74	8.99	9.12	9.16
145	0.55	0.40	0.48	0.80	1.52	2.35	3.19	3.71	4.14	4.55	5.07	5.56	6.02	6.38	6.67	6.90	7.06	7.16	7.20
150	0.49	0.29	0.32	0.56	1.17	1.88	2.61	3.03	3.38	3.70	4.09	4.48	4.84	5.15	5.43	5.65	5.80	5.89	5.93
155	0.44	0.27	0.28	0.45	0.90	1.45	2.02	2.41	2.75	3.05	3.29	3.49	3.67	3.84	3.99	4.12	4.24	4.33	4.38
160	0.40	0.35	0.34	0.37	0.40	0.50	0.70	1.20	1.76	2.29	2.54	2.72	2.83	2.97	3.08	3.16	3.23	3.28	3.30
165	0.36	0.35	0.35	0.34	0.29	0.26	0.30	0.47	0.72	1.00	1.35	1.68	1.97	2.11	2.18	2.22	2.26	2.29	2.30
170	0.35	0.34	0.33	0.32	0.31	0.30	0.29	0.28	0.26	0.25	0.22	0.21	0.23	0.36	0.51	0.66	0.77	0.84	0.86
175	0.37	0.36	0.36	0.35	0.35	0.34	0.33	0.32	0.32	0.31	0.30	0.29	0.28	0.28	0.27	0.27	0.26	0.26	0.26
180	0.39	0.39	0.39	0.39	0.38	0.38	0.37	0.37	0.36	0.36	0.35	0.34	0.33	0.33	0.32	0.32	0.32	0.33	0.34

C (DEG) γ (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	60.6	60.4	60.1	59.9	59.7	59.5	59.2	59.0	58.7	58.5	58.3	58.1	57.9	57.8	57.6	57.4	57.3	57.1	56.9
5	261	259	257	258	259	260	263	264	260	248	229	206	173	140	108	86.0	69.1	57.4	54.2
10	435	427	415	397	377	357	341	327	312	298	283	268	255	239	214	173	121	57.3	50.4
15	822	805	780	745	702	652	592	529	466	409	358	315	299	284	261	210	142	57.9	42.3
20	1013	1002	981	949	909	863	822	772	711	611	506	409	357	315	273	210	139	58.1	33.9
25	1222	1220	1208	1186	1150	1098	1018	925	827	736	645	555	462	370	282	202	127	56.8	38.2
30	962	978	1001	1038	1072	1096	1097	1075	1024	918	790	652	525	402	290	197	119	53.9	56.4
35	766	781	800	816	836	863	928	982	1007	938	833	705	575	443	318	215	127	51.3	72.9
40	710	714	716	703	694	697	749	805	849	851	822	760	634	488	340	229	132	49.6	76.2
45	700	694	685	669	654	644	647	657	671	713	740	736	630	495	349	239	138	46.3	65.5
50	645	644	643	644	644	640	620	601	589	623	650	650	553	428	296	200	115	41.3	53.7
55	651	642	630	615	599	584	574	566	561	573	576	560	485	391	288	202	118	36.6	44.8
60	646	641	633	621	606	587	563	537	513	505	494	470	407	331	248	176	104	32.9	37.5
65	642	635	626	612	596	576	552	526	497	470	437	397	336	270	201	141	83.2	27.8	29.8
70	633	628	619	606	590	568	543	513	479	439	395	344	280	213	150	100	57.9	23.0	22.2
75	620	615	605	589	570	546	522	493	459	417	368	312	244	176	114	70.1	37.9	17.0	15.3
80	522	521	519	516	509	499	483	461	432	389	338	280	213	146	86.8	48.2	22.5	9.78	8.37
85	267	268	270	272	274	277	280	282	279	271	255	229	176	119	65.6	34.0	13.8	4.93	4.71
90	105	105	105	105	104	104	103	102	101	101	98.4	92.2	74.3	53.8	33.4	20.0	9.66	2.44	2.60
95	62.6	62.4	61.8	60.9	59.6	58.0	55.8	53.2	50.3	47.7	44.4	39.9	32.3	24.0	15.9	10.1	5.46	1.89	1.98
100	50.3	50.1	49.6	48.7	47.5	45.8	43.3	40.3	36.8	32.7	28.2	23.5	18.9	14.5	10.5	7.11	4.27	1.95	1.83
105	40.2	39.9	39.1	37.0	34.3	31.3	28.1	24.9	21.8	19.7	17.7	15.8	13.1	10.3	7.62	5.38	3.38	1.63	1.56
110	23.6	23.7	23.5	23.0	22.2	21.2	19.7	18.0	16.3	15.0	13.7	12.3	10.2	8.13	6.06	4.34	2.79	1.41	1.36
115	20.0	20.0	19.7	18.8	17.6	16.4	15.4	14.5	13.5	12.5	11.5	10.2	8.47	6.63	4.83	3.43	2.21	1.20	1.18
120	15.8	15.9	15.7	15.2	14.6	14.0	13.8	13.6	13.2	11.7	10.0	8.22	6.67	5.22	3.89	2.76	1.78	0.96	1.02
125	14.2	14.4	14.5	14.6	14.6	14.3	13.6	12.6	11.4	9.93	8.35	6.77	5.44	4.23	3.15	2.23	1.46	0.83	0.93
130	15.5	15.8	15.9	15.5	14.8	13.7	12.0	10.2	8.37	7.31	6.44	5.65	4.62	3.61	2.66	1.90	1.26	0.74	0.82
135	14.2	13.8	13.1	12.0	10.7	9.47	8.43	7.48	6.63	5.97	5.35	4.73	3.91	3.07	2.27	1.65	1.11	0.68	0.77
140	9.12	8.99	8.74	8.31	7.80	7.24	6.68	6.11	5.53	4.99	4.43	3.85	3.15	2.46	1.81	1.32	0.92	0.62	0.70
145	7.16	7.06	6.90	6.67	6.38	6.02	5.56	5.07	4.55	4.14	3.71	3.19	2.35	1.52	0.80	0.48	0.40	0.55	0.63
150	5.89	5.80	5.65	5.43	5.15	4.84	4.48	4.09	3.70	3.38	3.03	2.61	1.88	1.17	0.56	0.32	0.29	0.49	0.58
155	4.33	4.24	4.12	3.99	3.84	3.67	3.49	3.29	3.05	2.75	2.41	2.02	1.45	0.90	0.45	0.28	0.27	0.44	0.52
160	3.28	3.23	3.16	3.08	2.97	2.83	2.72	2.54	2.29	1.76	1.20	0.70	0.50	0.40	0.37	0.34	0.35	0.40	0.48
165	2.29	2.26	2.22	2.18	2.11	1.97	1.68	1.35	1.00	0.72	0.47	0.30	0.26	0.29	0.34	0.35	0.35	0.36	0.43
170	0.84	0.77	0.66	0.51	0.36	0.23	0.21	0.22	0.25	0.26	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.39
175	0.26	0.26	0.27	0.27	0.28	0.28	0.29	0.30	0.31	0.32	0.32	0.33	0.34	0.35	0.35	0.36	0.36	0.37	0.40
180	0.33	0.32	0.32	0.32	0.33	0.33	0.34	0.35	0.36	0.36	0.37	0.37	0.38	0.38	0.39	0.39	0.39	0.39	0.48

Table--3

UNIT: ×10cd

C (DEG) y (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	60.2	61.2	61.5	61.6	61.5	61.6	61.7	61.7	61.7	61.6	61.6	61.6	61.6	61.5	61.4	61.1	60.9	61.1	61.4
5	51.0	48.0	45.1	42.2	39.5	36.8	34.2	31.9	29.7	27.9	26.5	25.9	25.7	25.8	25.9	26.0	26.2	26.0	25.9
10	44.2	38.7	32.7	28.3	26.2	28.3	33.6	41.9	54.9	69.5	84.0	95.1	105	113	118	123	125	123	118
15	32.5	28.6	30.1	37.8	52.1	80.8	111	138	147	149	146	140	132	123	112	104	98.1	104	112
20	23.7	27.4	56.0	90.3	122	130	129	121	102	82.0	64.8	64.9	69.5	75.6	75.3	74.1	72.7	74.1	75.3
25	31.9	38.0	69.2	103	130	119	97.4	73.1	63.1	56.0	51.0	45.8	41.8	39.0	37.8	37.5	37.8	37.5	37.8
30	59.9	64.3	72.7	79.9	83.6	75.2	63.6	51.6	45.1	40.5	37.9	38.0	39.1	40.6	40.3	39.9	39.5	39.9	40.3
35	87.4	94.9	92.9	85.6	74.8	61.8	49.0	38.5	37.3	38.5	40.4	37.9	34.8	31.7	29.6	28.1	27.3	28.1	29.6
40	92.3	98.0	86.9	70.0	52.2	46.5	43.1	40.5	34.6	28.6	23.1	19.4	16.7	14.7	13.3	12.6	12.4	12.6	13.3
45	76.8	80.1	70.8	57.0	42.3	36.2	31.7	28.0	22.3	16.9	12.2	9.43	7.58	6.43	5.60	5.19	5.12	5.19	5.60
50	60.9	62.8	56.9	47.6	37.0	29.0	21.8	15.6	11.2	7.88	5.54	3.99	3.07	2.59	2.25	2.13	2.16	2.13	2.25
55	49.0	49.3	43.8	35.8	26.8	19.8	13.7	8.59	5.71	3.92	2.88	2.01	1.50	1.25	1.09	1.06	1.10	1.06	1.09
60	39.2	38.0	32.0	24.5	16.7	11.9	8.19	5.41	3.57	2.39	1.69	1.11	0.77	0.60	0.49	0.47	0.50	0.47	0.49
65	29.9	27.8	22.3	15.8	9.49	6.42	4.40	3.16	2.18	1.57	1.19	0.77	0.47	0.26	0.18	0.17	0.20	0.17	0.18
70	20.7	18.2	14.1	9.75	5.79	4.00	2.95	2.38	1.75	1.29	0.95	0.60	0.33	0.14	0.09	0.10	0.14	0.10	0.09
75	13.4	11.2	8.57	5.99	3.76	2.80	2.28	2.02	1.59	1.23	0.93	0.64	0.40	0.23	0.19	0.20	0.23	0.20	0.19
80	7.07	5.89	4.78	3.81	3.00	2.49	2.12	1.83	1.49	1.17	0.90	0.66	0.46	0.33	0.30	0.31	0.34	0.31	0.30
85	4.41	4.03	3.50	2.94	2.41	2.09	1.83	1.60	1.33	1.07	0.85	0.66	0.52	0.42	0.40	0.41	0.43	0.41	0.40
90	2.65	2.59	2.35	2.05	1.75	1.58	1.45	1.32	1.13	0.94	0.77	0.65	0.56	0.50	0.49	0.50	0.51	0.50	0.49
95	2.00	1.94	1.75	1.52	1.30	1.19	1.10	1.02	0.89	0.77	0.66	0.60	0.57	0.56	0.56	0.56	0.57	0.56	0.56
100	1.70	1.56	1.40	1.25	1.10	1.02	0.95	0.89	0.80	0.71	0.64	0.61	0.60	0.60	0.60	0.61	0.61	0.61	0.60
105	1.47	1.38	1.26	1.13	1.02	0.95	0.90	0.85	0.78	0.71	0.66	0.63	0.63	0.63	0.63	0.63	0.64	0.64	0.63
110	1.30	1.23	1.13	1.03	0.94	0.89	0.85	0.82	0.76	0.70	0.65	0.63	0.62	0.62	0.63	0.63	0.63	0.63	0.63
115	1.15	1.10	1.02	0.95	0.87	0.84	0.81	0.78	0.73	0.68	0.63	0.62	0.61	0.62	0.62	0.62	0.62	0.62	0.62
120	1.05	1.05	0.99	0.92	0.84	0.81	0.79	0.77	0.72	0.67	0.63	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.61
125	0.98	1.00	0.95	0.88	0.81	0.79	0.78	0.76	0.73	0.69	0.66	0.65	0.65	0.65	0.65	0.64	0.64	0.64	0.65
130	0.88	0.90	0.87	0.84	0.79	0.77	0.76	0.75	0.72	0.70	0.68	0.68	0.68	0.69	0.69	0.69	0.69	0.69	0.69
135	0.84	0.87	0.85	0.81	0.76	0.75	0.73	0.72	0.71	0.69	0.68	0.69	0.70	0.71	0.71	0.71	0.71	0.71	0.71
140	0.75	0.78	0.78	0.75	0.72	0.70	0.69	0.68	0.67	0.67	0.67	0.68	0.69	0.71	0.71	0.71	0.71	0.71	0.71
145	0.68	0.72	0.72	0.71	0.69	0.67	0.65	0.63	0.63	0.63	0.64	0.66	0.67	0.68	0.69	0.69	0.69	0.69	0.69
150	0.64	0.67	0.67	0.65	0.62	0.61	0.59	0.59	0.59	0.60	0.62	0.62	0.63	0.64	0.65	0.65	0.65	0.65	0.65
155	0.58	0.61	0.61	0.60	0.57	0.57	0.56	0.56	0.56	0.57	0.58	0.58	0.58	0.58	0.58	0.58	0.57	0.58	0.58
160	0.54	0.57	0.57	0.56	0.54	0.54	0.55	0.55	0.55	0.55	0.55	0.54	0.54	0.53	0.52	0.51	0.50	0.51	0.52
165	0.48	0.51	0.52	0.51	0.50	0.51	0.52	0.52	0.51	0.50	0.49	0.47	0.46	0.44	0.43	0.42	0.41	0.42	0.43
170	0.43	0.45	0.46	0.45	0.45	0.45	0.44	0.44	0.42	0.40	0.37	0.35	0.32	0.30	0.29	0.29	0.29	0.29	0.29
175	0.42	0.43	0.43	0.43	0.42	0.42	0.41	0.40	0.38	0.36	0.34	0.33	0.31	0.30	0.30	0.30	0.31	0.30	0.30
180	0.38	0.37	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.37	0.36	0.35	0.34	0.33	0.32	0.32	0.32	0.32	0.32

C (DEG) γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	61.5	61.6	61.6	61.6	61.6	61.7	61.7	61.7	61.6	61.5	61.6	61.5	61.2	60.2	58.9				
5	25.8	25.7	25.9	26.5	27.9	29.7	31.9	34.2	36.8	39.5	42.2	45.1	48.0	51.0	54.2				
10	113	105	95.1	84.0	69.5	54.9	41.9	33.6	28.3	26.2	28.3	32.7	38.7	44.2	50.4				
15	123	132	140	146	149	147	138	111	80.8	52.1	37.8	30.1	28.6	32.5	42.3				
20	75.6	69.5	64.9	64.8	82.0	102	121	129	130	122	90.3	56.0	27.4	23.7	33.9				
25	39.0	41.8	45.8	51.0	56.0	63.1	73.1	97.4	119	130	103	69.2	38.0	31.9	38.2				
30	40.6	39.1	38.0	37.9	40.5	45.1	51.6	63.6	75.2	83.6	79.9	72.7	64.3	59.9	56.4				
35	31.7	34.8	37.9	40.4	38.5	37.3	38.5	49.0	61.8	74.8	85.6	92.9	94.9	87.4	72.9				
40	14.7	16.7	19.4	23.1	28.6	34.6	40.5	43.1	46.5	52.2	70.0	86.9	98.0	92.3	76.2				
45	6.43	7.58	9.43	12.2	16.9	22.3	28.0	31.7	36.2	42.3	57.0	70.8	80.1	76.8	65.5				
50	2.59	3.07	3.99	5.54	7.88	11.2	15.6	21.8	29.0	37.0	47.6	56.9	62.8	60.9	53.7				
55	1.25	1.50	2.01	2.88	3.92	5.71	8.59	13.7	19.8	26.8	35.8	43.8	49.3	49.0	44.8				
60	0.60	0.77	1.11	1.69	2.39	3.57	5.41	8.19	11.9	16.7	24.5	32.0	38.0	39.2	37.5				
65	0.26	0.47	0.77	1.19	1.57	2.18	3.16	4.40	6.42	9.49	15.8	22.3	27.8	29.9	29.8				
70	0.14	0.33	0.60	0.95	1.29	1.75	2.38	2.95	4.00	5.79	9.75	14.1	18.2	20.7	22.2				
75	0.23	0.40	0.64	0.93	1.23	1.59	2.02	2.28	2.80	3.76	5.99	8.57	11.2	13.4	15.3				
80	0.33	0.46	0.66	0.90	1.17	1.49	1.83	2.12	2.49	3.00	3.81	4.78	5.89	7.07	8.37				
85	0.42	0.52	0.66	0.85	1.07	1.33	1.60	1.83	2.09	2.41	2.94	3.50	4.03	4.41	4.71				
90	0.50	0.56	0.65	0.77	0.94	1.13	1.32	1.45	1.58	1.75	2.05	2.35	2.59	2.65	2.60				
95	0.56	0.57	0.60	0.66	0.77	0.89	1.02	1.10	1.19	1.30	1.52	1.75	1.94	2.00	1.98				
100	0.60	0.60	0.61	0.64	0.71	0.80	0.89	0.95	1.02	1.10	1.25	1.40	1.56	1.70	1.83				
105	0.63	0.63	0.63	0.66	0.71	0.78	0.85	0.90	0.95	1.02	1.13	1.26	1.38	1.47	1.56				
110	0.62	0.62	0.63	0.65	0.70	0.76	0.82	0.85	0.89	0.94	1.03	1.13	1.23	1.30	1.36				
115	0.62	0.61	0.62	0.63	0.68	0.73	0.78	0.81	0.84	0.87	0.95	1.02	1.10	1.15	1.18				
120	0.61	0.61	0.62	0.63	0.67	0.72	0.77	0.79	0.81	0.84	0.92	0.99	1.05	1.05	1.02				
125	0.65	0.65	0.65	0.66	0.69	0.73	0.76	0.78	0.79	0.81	0.88	0.95	1.00	0.98	0.93				
130	0.69	0.68	0.68	0.68	0.70	0.72	0.75	0.76	0.77	0.79	0.84	0.87	0.90	0.88	0.82				
135	0.71	0.70	0.69	0.68	0.69	0.71	0.72	0.73	0.75	0.76	0.81	0.85	0.87	0.84	0.77				
140	0.71	0.69	0.68	0.67	0.67	0.67	0.68	0.69	0.70	0.72	0.75	0.78	0.78	0.75	0.70				
145	0.68	0.67	0.66	0.64	0.63	0.63	0.63	0.65	0.67	0.69	0.71	0.72	0.72	0.68	0.63				
150	0.64	0.63	0.62	0.62	0.60	0.59	0.59	0.59	0.61	0.62	0.65	0.67	0.67	0.64	0.58				
155	0.58	0.58	0.58	0.58	0.57	0.56	0.56	0.56	0.57	0.57	0.60	0.61	0.61	0.58	0.52				
160	0.53	0.54	0.54	0.55	0.55	0.55	0.55	0.55	0.54	0.54	0.56	0.57	0.57	0.54	0.48				
165	0.44	0.46	0.47	0.49	0.50	0.51	0.52	0.52	0.51	0.50	0.51	0.52	0.51	0.48	0.43				
170	0.30	0.32	0.35	0.37	0.40	0.42	0.44	0.44	0.45	0.45	0.45	0.46	0.45	0.43	0.39				
175	0.30	0.31	0.33	0.34	0.36	0.38	0.40	0.41	0.42	0.42	0.43	0.43	0.43	0.42	0.40				
180	0.33	0.34	0.35	0.36	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.37	0.37	0.37	0.38				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34L @ 100W / 3000K	Sample ID	230612001-S1
Temperature (°C)	25.4	Humidity (%RH)	41.0

Test Method
<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	0.889	106.1	0.995	3.64
277.0	60	0.412	102.5	0.899	11.94

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*****