

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		20563
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		141.8
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		19831
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	136.8
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		145.0
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	3.43
			277V	8.45
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.997
			277V	0.937
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3045±175	3077
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		72.3
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		1.212
(Goniophotometer – Section 4.2)		Non-Worst Case		0.543
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		145.0
(Goniophotometer – Section 4.2)		Non-Worst Case		141.0

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-12	W34L @ 150W / 3000K	230612001-S1
2	Goniophotometer Test	2023-06-12	W34L @ 150W / 3000K	230612001-S1
3	THD and PF Test	2023-06-12	W34L @ 150W / 3000K	230612001-S1

Remark (If any)

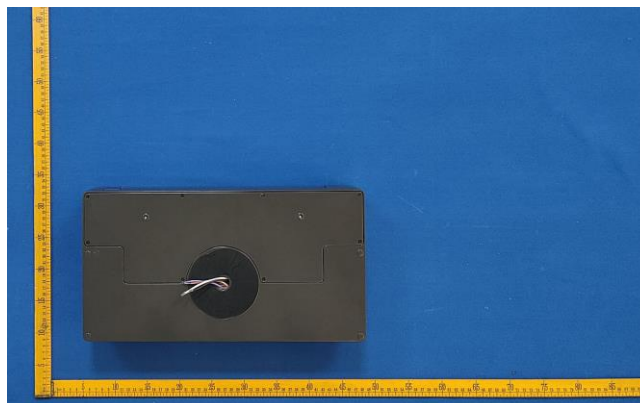
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34L @ 150W / 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 @ 150W / 3000K	Sample ID	230612001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

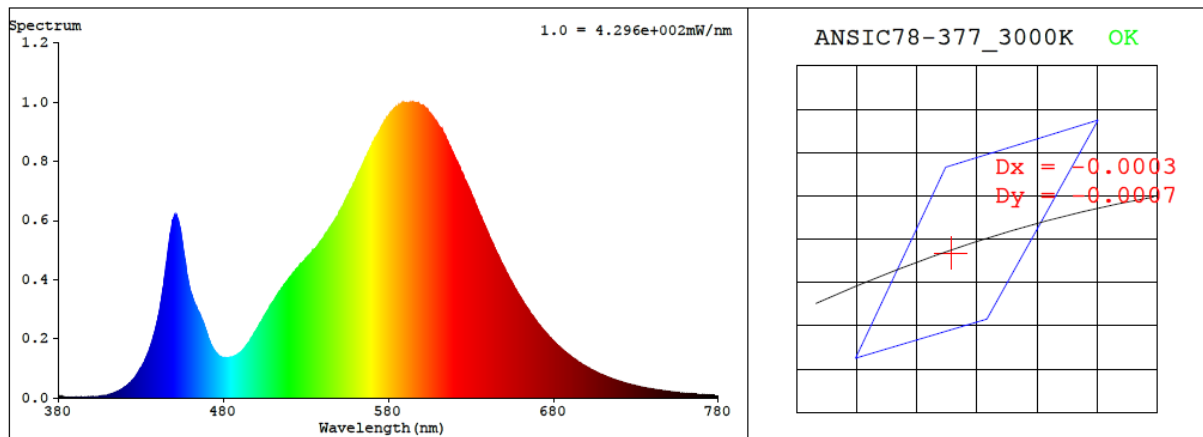
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	1.212	145.0	0.997
277.0	60	0.543	141.0	0.937

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3077	72.3	-34	-0.0002	76	93	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4312$ $y = 0.4014$ / $u' = 0.2480$ $v' = 0.5195$ ($duv = -2.42e-04$)

CCT= 3077K Prcp WL: $L_d = 582.6\text{nm}$ Purity=49.9%

Peak WL: $L_p = 595\text{nm}$ FWHM: $\approx 110.7\text{nm}$ Ratio: R=20.8% G=77.1% B=2.1%

Render Index: $R_a = 72.3$ AvgR = 63.4 TM30: $R_f = 75$ $R_g = 93$

EEL: 0.09550 A++ Highest

R1 =68	R2 =84	R3 =94	R4 =67	R5 =68	R6 =77	R7 =77
R8 =43	R9 =-34	R10=62	R11=62	R12=52	R13=71	R14=97 R15=61

4.1 Integrating Sphere Test

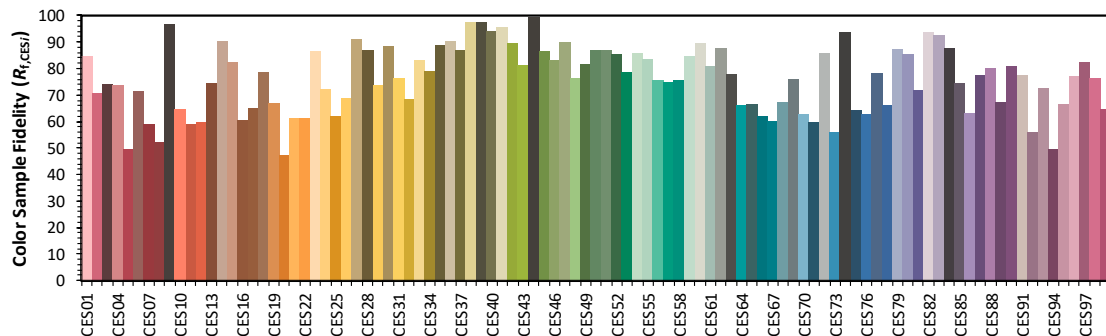
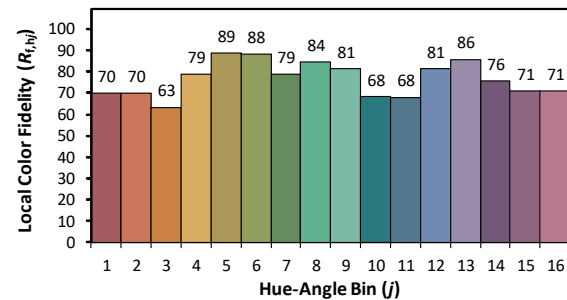
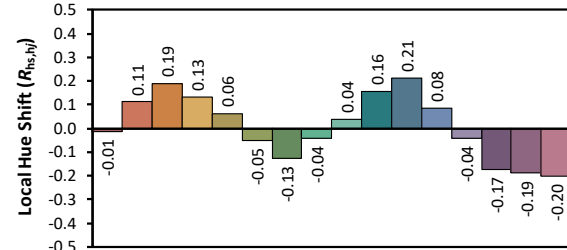
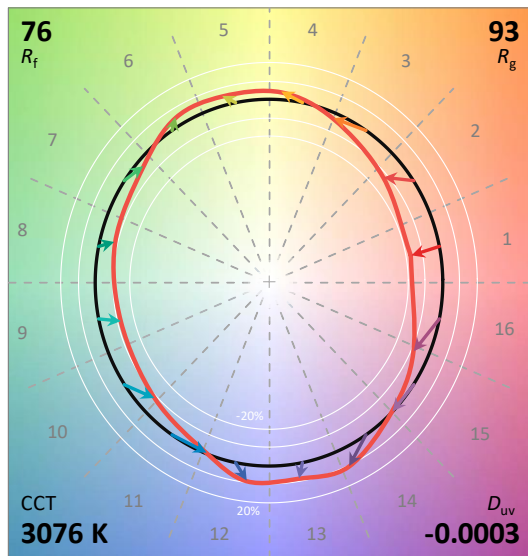
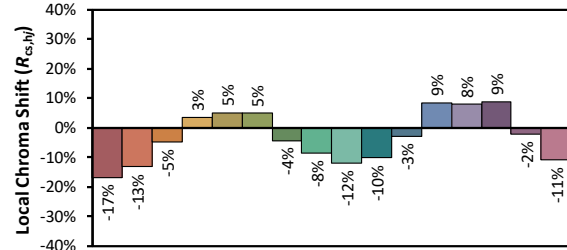
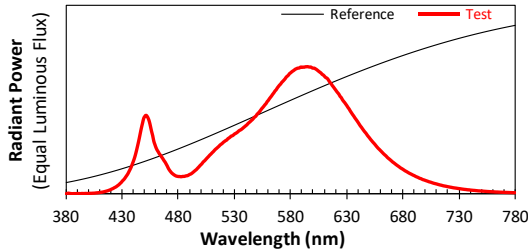
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/13

Model: W34L @ 150W / 3000K



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

x 0.4312
 y 0.4013
 u' 0.2481
 v' 0.5194

CIE 13.3-1995
(CRI)

R_a 72
 R_g -34

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	1.70E-06	447	5.20E-04	514	3.58E-04	581	9.60E-04	648	4.64E-04	715	6.59E-05
381	3.80E-06	448	5.57E-04	515	3.66E-04	582	9.66E-04	649	4.52E-04	716	6.34E-05
382	5.30E-06	449	5.93E-04	516	3.74E-04	583	9.72E-04	650	4.42E-04	717	6.18E-05
383	3.50E-06	450	6.09E-04	517	3.83E-04	584	9.80E-04	651	4.30E-04	718	6.02E-05
384	2.60E-06	451	6.18E-04	518	3.90E-04	585	9.83E-04	652	4.19E-04	719	5.83E-05
385	1.40E-06	452	6.10E-04	519	3.97E-04	586	9.88E-04	653	4.09E-04	720	5.63E-05
386	1.60E-06	453	5.94E-04	520	4.06E-04	587	9.89E-04	654	3.99E-04	721	5.48E-05
387	2.00E-06	454	5.69E-04	521	4.12E-04	588	9.91E-04	655	3.89E-04	722	5.29E-05
388	1.80E-06	455	5.32E-04	522	4.19E-04	589	9.97E-04	656	3.78E-04	723	5.14E-05
389	1.80E-06	456	4.92E-04	523	4.23E-04	590	9.94E-04	657	3.67E-04	724	4.96E-05
390	2.50E-06	457	4.58E-04	524	4.33E-04	591	9.96E-04	658	3.57E-04	725	4.78E-05
391	2.50E-06	458	4.14E-04	525	4.39E-04	592	9.95E-04	659	3.49E-04	726	4.65E-05
392	2.20E-06	459	3.88E-04	526	4.46E-04	593	9.99E-04	660	3.40E-04	727	4.54E-05
393	1.90E-06	460	3.63E-04	527	4.54E-04	594	9.99E-04	661	3.31E-04	728	4.41E-05
394	3.20E-06	461	3.44E-04	528	4.57E-04	595	1.00E-03	662	3.22E-04	729	4.26E-05
395	2.60E-06	462	3.30E-04	529	4.63E-04	596	9.98E-04	663	3.13E-04	730	4.13E-05
396	2.80E-06	463	3.14E-04	530	4.71E-04	597	9.97E-04	664	3.05E-04	731	4.01E-05
397	3.40E-06	464	3.03E-04	531	4.76E-04	598	9.97E-04	665	2.97E-04	732	3.87E-05
398	3.20E-06	465	2.90E-04	532	4.81E-04	599	9.91E-04	666	2.87E-04	733	3.73E-05
399	3.00E-06	466	2.77E-04	533	4.88E-04	600	9.88E-04	667	2.80E-04	734	3.62E-05
400	3.00E-06	467	2.63E-04	534	4.97E-04	601	9.88E-04	668	2.73E-04	735	3.49E-05
401	4.60E-06	468	2.51E-04	535	5.01E-04	602	9.83E-04	669	2.65E-04	736	3.43E-05
402	3.90E-06	469	2.35E-04	536	5.06E-04	603	9.77E-04	670	2.57E-04	737	3.28E-05
403	4.90E-06	470	2.19E-04	537	5.13E-04	604	9.70E-04	671	2.49E-04	738	3.19E-05
404	5.20E-06	471	2.00E-04	538	5.21E-04	605	9.63E-04	672	2.43E-04	739	3.14E-05
405	5.60E-06	472	1.86E-04	539	5.29E-04	606	9.56E-04	673	2.36E-04	740	2.99E-05
406	6.50E-06	473	1.74E-04	540	5.36E-04	607	9.50E-04	674	2.29E-04	741	2.91E-05
407	7.70E-06	474	1.64E-04	541	5.43E-04	608	9.39E-04	675	2.23E-04	742	2.82E-05
408	8.40E-06	475	1.57E-04	542	5.54E-04	609	9.34E-04	676	2.17E-04	743	2.73E-05
409	9.50E-06	476	1.50E-04	543	5.61E-04	610	9.25E-04	677	2.10E-04	744	2.68E-05
410	1.06E-05	477	1.44E-04	544	5.69E-04	611	9.16E-04	678	2.03E-04	745	2.56E-05
411	1.20E-05	478	1.40E-04	545	5.77E-04	612	9.11E-04	679	1.98E-04	746	2.48E-05
412	1.34E-05	479	1.38E-04	546	5.85E-04	613	9.03E-04	680	1.93E-04	747	2.36E-05
413	1.52E-05	480	1.36E-04	547	5.96E-04	614	8.89E-04	681	1.87E-04	748	2.32E-05
414	1.74E-05	481	1.36E-04	548	6.05E-04	615	8.76E-04	682	1.81E-04	749	2.27E-05
415	1.98E-05	482	1.35E-04	549	6.11E-04	616	8.66E-04	683	1.76E-04	750	2.20E-05
416	2.21E-05	483	1.36E-04	550	6.25E-04	617	8.52E-04	684	1.71E-04	751	2.15E-05
417	2.47E-05	484	1.37E-04	551	6.34E-04	618	8.41E-04	685	1.66E-04	752	2.08E-05
418	2.79E-05	485	1.37E-04	552	6.44E-04	619	8.29E-04	686	1.61E-04	753	2.00E-05
419	3.11E-05	486	1.40E-04	553	6.55E-04	620	8.17E-04	687	1.57E-04	754	1.95E-05
420	3.55E-05	487	1.42E-04	554	6.68E-04	621	8.05E-04	688	1.52E-04	755	1.87E-05
421	3.95E-05	488	1.43E-04	555	6.78E-04	622	7.94E-04	689	1.47E-04	756	1.82E-05
422	4.37E-05	489	1.48E-04	556	6.88E-04	623	7.83E-04	690	1.44E-04	757	1.76E-05
423	4.91E-05	490	1.53E-04	557	7.00E-04	624	7.66E-04	691	1.39E-04	758	1.72E-05
424	5.34E-05	491	1.56E-04	558	7.10E-04	625	7.57E-04	692	1.34E-04	759	1.68E-05
425	5.94E-05	492	1.62E-04	559	7.24E-04	626	7.41E-04	693	1.31E-04	760	1.61E-05
426	6.62E-05	493	1.69E-04	560	7.35E-04	627	7.29E-04	694	1.27E-04	761	1.58E-05
427	7.29E-05	494	1.77E-04	561	7.48E-04	628	7.18E-04	695	1.22E-04	762	1.50E-05
428	8.20E-05	495	1.85E-04	562	7.59E-04	629	7.06E-04	696	1.20E-04	763	1.45E-05
429	8.98E-05	496	1.92E-04	563	7.71E-04	630	6.94E-04	697	1.15E-04	764	1.44E-05
430	1.01E-04	497	2.01E-04	564	7.84E-04	631	6.79E-04	698	1.11E-04	765	1.39E-05
431	1.10E-04	498	2.10E-04	565	7.95E-04	632	6.68E-04	699	1.09E-04	766	1.35E-05
432	1.20E-04	499	2.21E-04	566	8.09E-04	633	6.52E-04	700	1.05E-04	767	1.29E-05
433	1.36E-04	500	2.29E-04	567	8.18E-04	634	6.39E-04	701	1.02E-04	768	1.27E-05
434	1.46E-04	501	2.38E-04	568	8.32E-04	635	6.25E-04	702	9.94E-05	769	1.21E-05
435	1.59E-04	502	2.51E-04	569	8.43E-04	636	6.14E-04	703	9.56E-05	770	1.20E-05
436	1.77E-04	503	2.58E-04	570	8.55E-04	637	6.00E-04	704	9.34E-05	771	1.15E-05
437	1.95E-04	504	2.67E-04	571	8.63E-04	638	5.87E-04	705	9.07E-05	772	1.13E-05
438	2.14E-04	505	2.77E-04	572	8.76E-04	639	5.75E-04	706	8.75E-05	773	1.10E-05
439	2.38E-04	506	2.87E-04	573	8.85E-04	640	5.62E-04	707	8.45E-05	774	1.06E-05
440	2.61E-04	507	2.96E-04	574	8.95E-04	641	5.48E-04	708	8.21E-05	775	1.02E-05
441	2.88E-04	508	3.06E-04	575	9.05E-04	642	5.35E-04	709	7.98E-05	776	1.00E-05
442	3.20E-04	509	3.14E-04	576	9.18E-04	643	5.24E-04	710	7.77E-05	777	9.70E-06
443	3.56E-04	510	3.24E-04	577	9.25E-04	644	5.11E-04	711	7.49E-05	778	9.20E-06
444	3.94E-04	511	3.32E-04	578	9.34E-04	645	4.99E-04	712	7.25E-05	779	9.30E-06
445	4.34E-04	512	3.42E-04	579	9.46E-04	646	4.87E-04	713	7.00E-05	780	9.30E-06
446	4.78E-04	513	3.51E-04	580	9.52E-04	647	4.77E-04	714	6.83E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34L @ 150W / 3000K	Sample ID	230612001-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	40.5

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	1.212	145.0	0.997
NON-WORST CASE	277.0	60	0.543	141.0	0.937

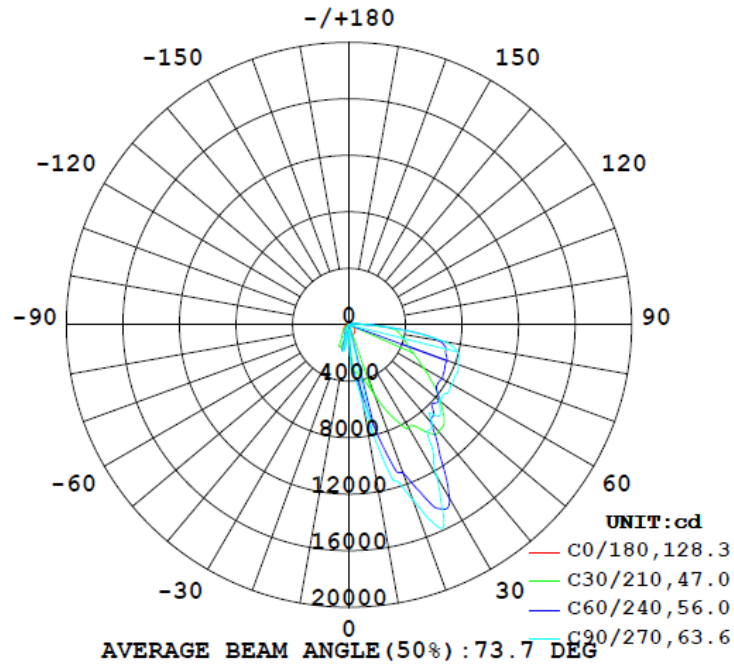
Test Result

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	20563	103.7	133.3	63.2	83.4	141.8	7.4%	B1-U3-G5
0°-90° zones	19831	103.7	133.3	63.2	83.4	136.8	7.6%	B1-U3-G5

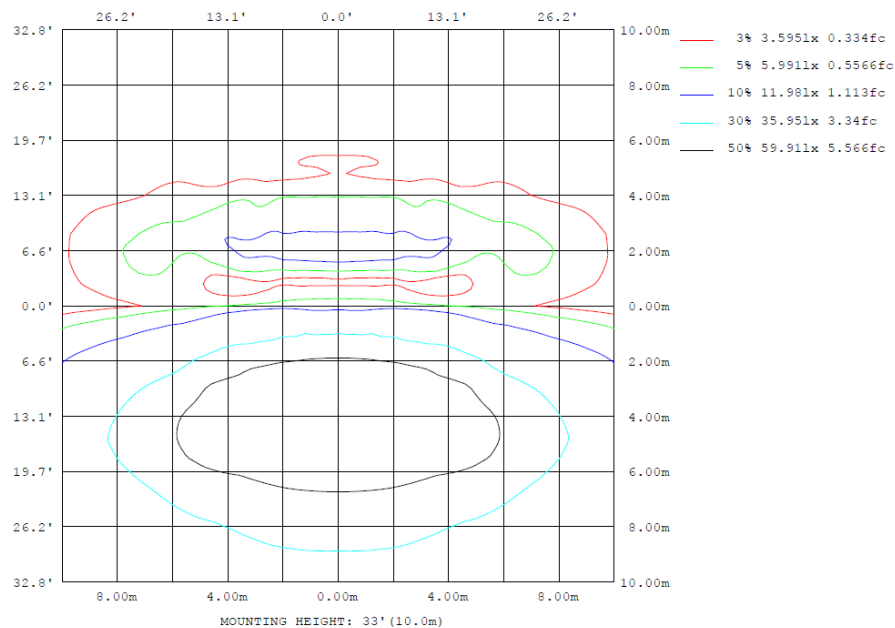
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

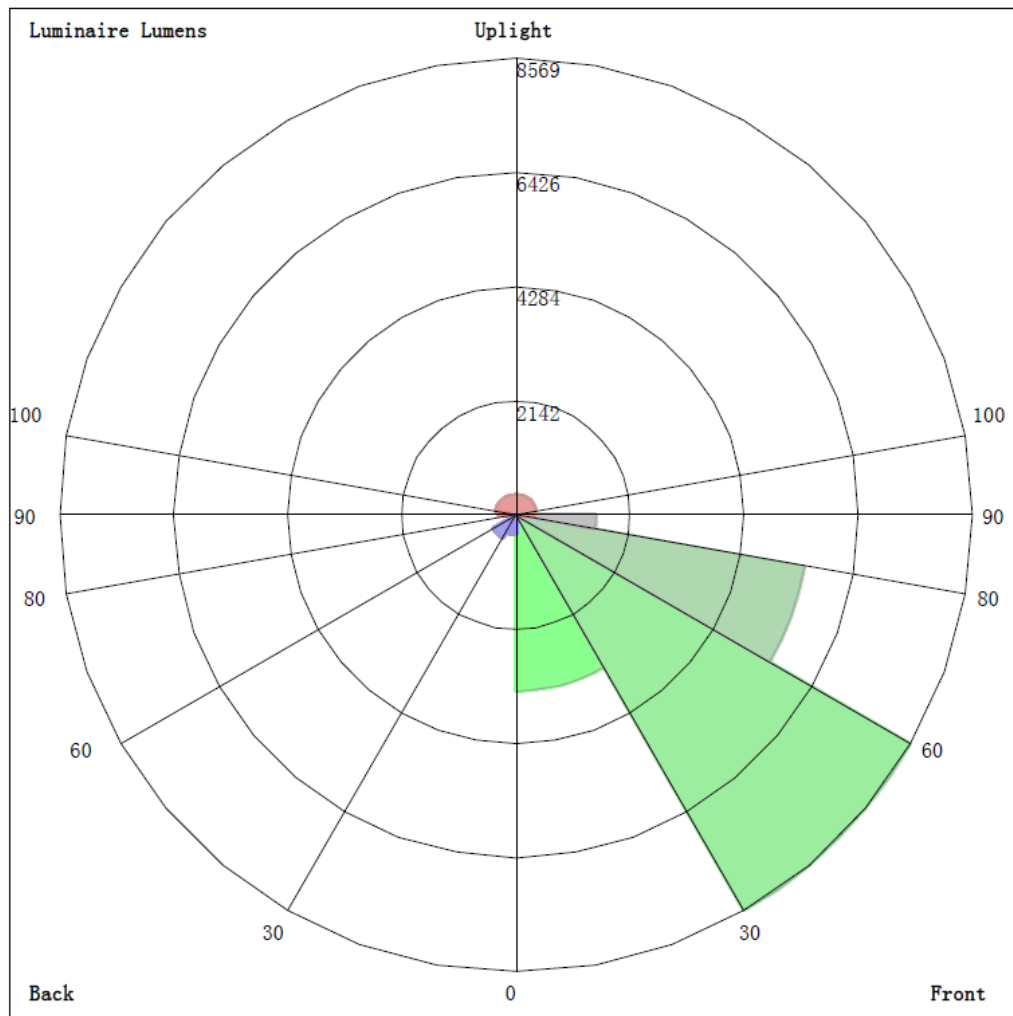
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	74.14	404.5	565.4	404.5	74.14	54.58	160.9	54.58	0- 10	171.2	171.2	0.83,0.83
20	75.26	916.4	1319	916.4	75.26	157.0	93.96	157.0	10- 20	1067	1238	6.02,6.02
30	69.85	1328	1240	1328	69.85	66.45	51.08	66.45	20- 30	2428	3666	17.8,17.8
40	64.26	1103	913.3	1103	64.26	52.23	16.05	52.23	30- 40	3002	6668	32.4,32.4
50	53.76	763.3	837.0	763.3	53.76	20.26	2.728	20.26	40- 50	3054	9722	47.3,47.3
60	42.50	664.7	839.7	664.7	42.50	7.008	0.6497	7.008	50- 60	2999	12720	61.9,61.9
70	29.77	620.6	821.7	620.6	29.77	3.093	0.1875	3.093	60- 70	2898	15619	76,76
80	12.64	560.4	678.5	560.4	12.64	2.379	0.4372	2.379	70- 80	2698	18317	89.1,89.1
90	3.166	131.4	136.6	131.4	3.166	1.706	0.6680	1.706	80- 90	1514	19831	96.4,96.4
100	2.520	47.60	65.00	47.60	2.520	1.148	0.7954	1.148	90-100	346.3	20177	98.1,98.1
110	1.834	21.09	30.40	21.09	1.834	1.058	0.8218	1.058	100-110	164.3	20342	98.9,98.9
120	1.239	16.91	20.35	16.91	1.239	0.9929	0.7950	0.9929	110-120	86.88	20428	99.3,99.3
130	0.9632	10.84	19.48	10.84	0.9632	0.9702	0.8867	0.9702	120-130	60.61	20489	99.6,99.6
140	0.7981	7.144	11.85	7.144	0.7981	0.8742	0.9230	0.8742	130-140	40.28	20529	99.8,99.8
150	0.6315	4.786	7.645	4.786	0.6315	0.7621	0.8455	0.7621	140-150	20.21	20550	99.9,99.9
160	0.5159	2.960	4.271	2.960	0.5159	0.7178	0.6415	0.7178	150-160	9.735	20559	100,100
170	0.4467	0.3281	1.109	0.3281	0.4467	0.5676	0.3753	0.5676	160-170	3.123	20562	100,100
180	0.5087	0.4602	0.4326	0.4602	0.5087	0.4930	0.4130	0.4930	170-180	0.4149	20563	100,100
DEG	LUMINOUS INTENSITY:*10cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	171.23	0-10	171.23	0.83%
10-20	1066.73	0-20	1237.96	6.02%
20-30	2427.89	0-30	3665.85	17.83%
30-40	3001.71	0-40	6667.56	32.43%
40-50	3054.31	0-50	9721.87	47.28%
50-60	2998.58	0-60	12720.45	61.86%
60-70	2898.45	0-70	15618.90	75.96%
70-80	2698.41	0-80	18317.31	89.08%
80-90	1513.74	0-90	19831.05	96.44%
90-100	346.26	0-100	20177.31	98.13%
100-110	164.26	0-110	20341.57	98.93%
110-120	86.88	0-120	20428.45	99.35%
120-130	60.61	0-130	20489.06	99.64%
130-140	40.28	0-140	20529.34	99.84%
140-150	20.21	0-150	20549.55	99.94%
150-160	9.74	0-160	20559.29	99.98%
160-170	3.12	0-170	20562.41	100.00%
170-180	0.41	0-180	20562.82	100.00%

4.2 Goniophotometer Test

LCS/BUG

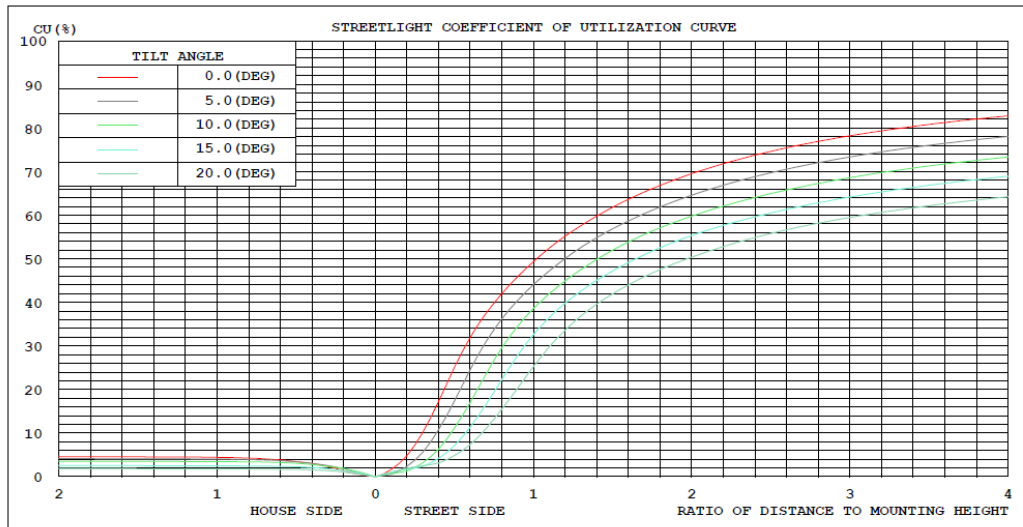


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

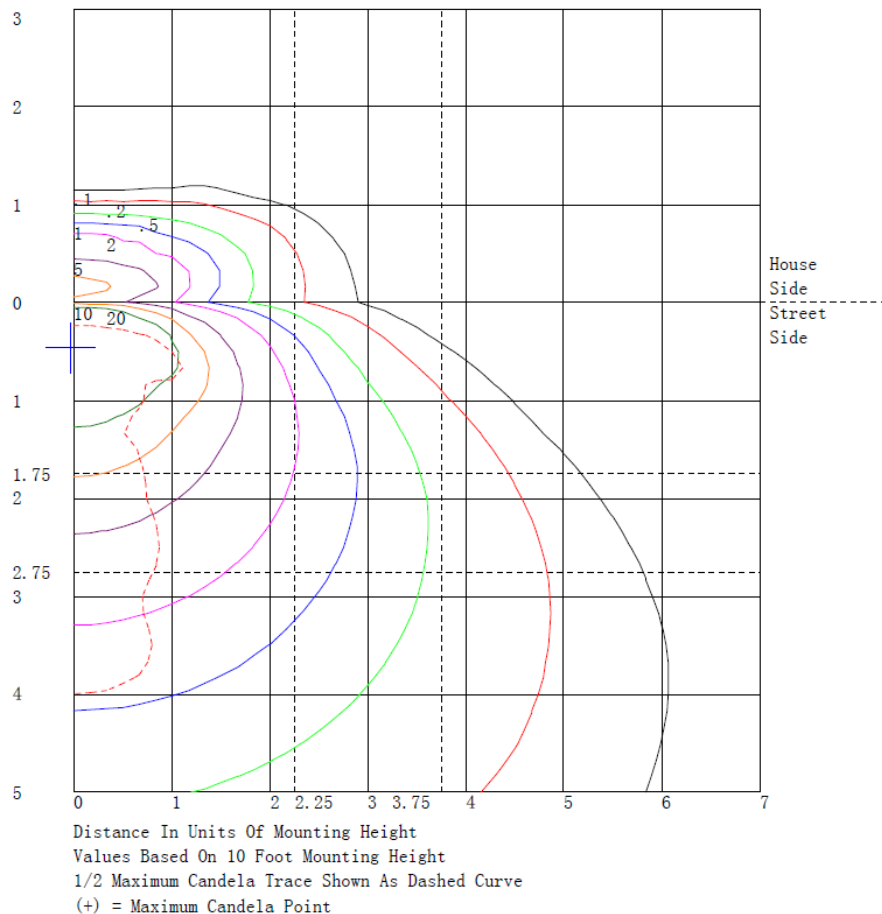
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	3297.2	N.A.	16.0
FM - Front-Medium (30-60)	8568.6	N.A.	41.7
FH - Front-High (60-80)	5505.1	N.A.	26.8
FVH - Front-Very High (80-90)	1499.2	N.A.	7.3
BL - Back-Low (0-30)	368.6	N.A.	1.8
BM - Back-Medium (30-60)	486.0	N.A.	2.4
BH - Back-High (60-80)	91.8	N.A.	0.4
BVH - Back-Very High (80-90)	14.6	N.A.	0.1
UL - Uplight-Low (90-100)	346.3	N.A.	1.7
UH - Uplight-High (100-180)	385.5	N.A.	1.9
Total	20562.9	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: $\times 10\text{cd}$

C (DEG) y (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	74.0	74.1	74.3	74.5	74.7	75.0	75.3	75.5	75.8	76.0	76.3	76.5	76.8	77.1	77.4	77.7	77.9	78.2	78.4
5	74.1	88.7	110	138	179	223	265	296	320	337	341	340	336	334	333	332	334	337	339
10	74.1	154	221	273	306	329	347	367	386	405	423	441	461	487	512	535	551	561	565
15	74.9	184	271	338	367	387	408	462	528	601	682	764	843	907	961	1005	1037	1057	1065
20	75.3	179	272	353	407	462	528	653	788	916	997	1063	1118	1176	1228	1270	1297	1314	1319
25	73.6	165	262	366	479	597	717	834	952	1070	1198	1318	1423	1489	1536	1565	1580	1584	1580
30	69.8	154	256	376	521	679	844	1024	1190	1328	1393	1422	1420	1390	1346	1299	1270	1250	1240
35	66.7	164	279	411	574	745	914	1080	1216	1306	1275	1204	1120	1085	1059	1038	1013	994	984
40	64.3	171	296	440	633	822	985	1066	1104	1103	1045	972	903	900	912	929	925	919	913
45	60.1	178	308	451	640	816	953	960	925	872	853	840	836	848	866	886	898	906	909
50	53.8	149	260	384	556	717	843	842	807	763	779	804	829	835	836	835	836	837	837
55	47.4	153	262	374	507	629	725	746	742	727	734	744	757	776	796	815	831	842	847
60	42.5	135	228	322	428	527	609	640	655	665	696	730	762	785	805	821	832	838	840
65	36.0	108	183	261	350	437	515	567	609	644	682	716	747	773	794	811	823	832	835
70	29.8	74.8	130	194	277	363	446	512	570	621	665	704	737	764	786	803	814	820	822
75	22.1	49.0	90.7	147	228	317	406	477	541	596	640	677	708	738	764	784	797	803	805
80	12.6	29.0	62.2	112	190	276	364	438	504	560	599	628	648	662	671	675	679	680	678
85	6.36	17.9	44.1	85.2	155	229	297	331	351	361	365	365	361	358	355	352	350	348	347
90	3.17	13.2	26.6	43.4	67.5	91.9	114	123	129	131	134	135	135	136	137	137	137	137	137
95	2.46	7.09	13.1	20.6	31.1	41.8	51.7	57.4	61.7	65.1	68.9	72.3	75.2	77.4	79.1	80.2	80.9	81.1	81.0
100	2.52	5.54	9.20	13.5	18.8	24.5	30.4	36.4	42.2	47.6	52.1	56.0	59.1	61.4	63.0	64.1	64.8	65.0	65.0
105	2.11	4.40	7.00	9.90	13.4	16.9	20.4	22.9	25.4	28.2	32.1	36.3	40.5	44.3	47.7	50.3	51.4	51.8	51.6
110	1.83	3.62	5.62	7.84	10.5	13.2	15.8	17.7	19.4	21.1	23.3	25.4	27.4	28.7	29.7	30.4	30.6	30.6	30.4
115	1.55	2.86	4.43	6.25	8.56	10.9	13.2	14.8	16.1	17.4	18.6	19.9	21.2	22.8	24.2	25.4	25.7	25.7	25.6
120	1.24	2.29	3.55	5.02	6.75	8.64	10.6	13.0	15.1	16.9	17.5	17.8	18.0	18.8	19.6	20.3	20.4	20.4	20.4
125	1.07	1.89	2.89	4.08	5.47	7.03	8.75	10.8	12.8	14.7	16.2	17.4	18.3	18.7	18.8	18.7	18.5	18.3	18.2
130	0.96	1.64	2.47	3.45	4.67	5.97	7.30	8.34	9.47	10.8	13.1	15.5	17.7	19.0	19.8	20.3	20.2	19.8	19.5
135	0.88	1.44	2.13	2.95	3.97	5.05	6.11	6.92	7.72	8.56	9.62	10.8	12.1	13.8	15.4	16.8	17.7	18.2	18.4
140	0.80	1.21	1.73	2.37	3.20	4.09	4.98	5.73	6.44	7.14	7.93	8.70	9.44	10.1	10.7	11.2	11.5	11.8	11.8
145	0.71	0.52	0.63	1.05	1.97	3.05	4.13	4.80	5.37	5.89	6.55	7.19	7.77	8.23	8.61	8.90	9.12	9.25	9.30
150	0.63	0.38	0.41	0.72	1.51	2.44	3.37	3.92	4.37	4.79	5.29	5.79	6.26	6.66	7.01	7.30	7.49	7.60	7.65
155	0.57	0.35	0.36	0.58	1.17	1.88	2.62	3.13	3.57	3.95	4.26	4.52	4.74	4.96	5.15	5.32	5.48	5.60	5.66
160	0.52	0.48	0.46	0.48	0.43	0.48	0.68	1.39	2.20	2.96	3.31	3.52	3.67	3.84	3.98	4.09	4.18	4.24	4.27
165	0.47	0.46	0.45	0.44	0.40	0.38	0.38	0.37	0.45	0.65	1.26	1.94	2.55	2.76	2.85	2.86	2.92	2.96	2.98
170	0.45	0.44	0.43	0.42	0.40	0.39	0.37	0.36	0.34	0.33	0.31	0.31	0.31	0.30	0.32	0.39	0.65	0.92	1.11
175	0.47	0.47	0.46	0.45	0.45	0.44	0.43	0.42	0.41	0.40	0.39	0.38	0.37	0.36	0.35	0.34	0.34	0.34	0.34
180	0.51	0.51	0.50	0.50	0.50	0.49	0.48	0.48	0.47	0.46	0.45	0.44	0.43	0.42	0.42	0.41	0.42	0.42	0.43

C (DEG) y (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	78.2	77.9	77.7	77.4	77.1	76.8	76.5	76.3	76.0	75.8	75.5	75.3	75.0	74.7	74.5	74.3	74.1	74.0	76.1
5	337	334	332	333	334	336	340	341	337	320	296	265	223	179	138	110	88.7	74.1	70.0
10	561	551	535	512	487	461	441	423	405	386	367	347	329	306	273	221	154	74.1	65.1
15	1057	1037	1005	961	907	843	764	682	601	528	462	408	387	367	338	271	184	74.9	54.3
20	1314	1297	1270	1228	1176	1118	1063	997	916	788	653	528	462	407	353	272	179	75.3	44.0
25	1584	1580	1565	1536	1489	1423	1318	1198	1070	952	834	717	597	479	366	262	165	73.6	49.6
30	1250	1270	1299	1346	1390	1420	1422	1393	1328	1190	1024	844	679	521	376	256	154	69.8	72.7
35	994	1013	1038	1059	1085	1120	1204	1275	1306	1216	1080	914	745	574	411	279	164	66.7	93.8
40	919	925	929	912	900	903	972	1045	1103	1104	1066	985	822	633	440	296	171	64.3	98.2
45	906	898	886	866	848	836	840	853	872	925	960	953	816	640	451	308	178	60.1	84.6
50	837	836	835	836	835	829	804	779	763	807	842	843	717	556	384	260	149	53.8	69.5
55	842	831	815	796	776	757	744	734	727	742	746	725	629	507	374	262	153	47.4	57.8
60	838	832	821	805	785	762	730	696	665	655	640	609	527	428	322	228	135	42.5	48.4
65	832	823	811	794	773	747	716	682	644	609	567	515	437	350	261	183	108	36.0	38.6
70	820	814	803	786	764	737	704	665	621	570	512	446	363	277	194	130	74.8	29.8	28.8
75	803	797	784	764	738	708	677	640	596	541	477	406	317	228	147	90.7	49.0	22.1	19.8
80	680	679	675	671	662	648	628	599	560	504	438	364	276	190	112	62.2	29.0	12.6	10.8
85	348	350	352	355	358	361	365	365	361	351	331	297	229	155	85.2	44.1	17.9	6.36	6.09
90	137	137	137	137	136	135	135	134	131	129	123	114	91.9	67.5	43.4	26.6	13.2	3.17	3.35
95	81.1	80.9	80.2	79.1	77.4	75.2	72.3	68.9	65.1	61.7	57.4	51.7	41.8	31.1	20.6	13.1	7.09	2.46	2.52
100	65.0	64.8	64.1	63.0	61.4	59.1	56.0	52.1	47.6	42.2	36.4	30.4	24.5	18.8	13.5	9.20	5.54	2.52	2.36
105	51.8	51.4	50.3	47.7	44.3	40.5	36.3	32.1	28.2	25.4	22.9	20.4	16.9	13.4	9.90	7.00	4.40	2.11	2.01
110	30.6	30.6	30.4	29.7	28.7	27.4	25.4	23.3	21.1	19.4	17.7	15.8	13.2	10.5	7.84	5.62	3.62	1.83	1.76
115	25.7	25.7	25.4	24.2	22.8	21.2	19.9	18.6	17.4	16.1	14.8	13.2	10.9	8.56	6.25	4.43	2.86	1.55	1.52
120	20.4	20.4	20.3	19.6	18.8	18.0	17.8	17.5	16.9	15.1	13.0	10.6	8.64	6.75	5.02	3.55	2.29	1.24	1.32
125	18.3	18.5	18.7	18.8	18.7	18.3	17.4	16.2	14.7	12.8	10.8	8.75	7.03	5.47	4.08	2.89	1.89	1.07	1.20
130	19.8	20.2	20.3	19.8	19.0	17.7	15.5	13.1	10.8	9.47	8.34	7.30	5.97	4.67	3.45	2.47	1.64	0.96	1.06
135	18.2	17.7	16.8	15.4	13.8	12.1	10.8	9.62	8.56	7.72	6.92	6.11	5.05	3.97	2.95	2.13	1.44	0.88	1.00
140	11.8	11.5	11.2	10.7	10.1	9.44	8.70	7.93	7.14	6.44	5.73	4.98	4.09	3.20	2.37	1.73	1.21	0.80	0.90
145	9.25	9.12	8.90	8.61	8.23	7.77	7.19	6.55	5.89	5.37	4.80	4.13	3.05	1.97	1.05	0.63	0.52	0.71	0.81
150	7.60	7.49	7.30	7.01	6.66	6.26	5.79	5.29	4.79	4.37	3.92	3.37	2.44	1.51	0.72	0.41	0.38	0.63	0.75
155	5.60	5.48	5.32	5.15	4.96	4.74	4.52	4.26	3.95	3.57	3.13	2.62	1.88	1.17	0.58	0.36	0.35	0.57	0.67
160	4.24	4.18	4.09	3.98	3.84	3.67	3.52	3.31	2.96	2.20	1.39	0.68	0.48	0.43	0.48	0.46	0.48	0.52	0.62
165	2.96	2.92	2.86	2.85	2.76	2.55	1.94	1.26	0.65	0.45	0.37	0.38	0.38	0.40	0.44	0.45	0.46	0.47	0.55
170	0.92	0.65	0.39	0.32	0.30	0.31	0.31	0.31	0.33	0.34	0.36	0.37	0.39	0.40	0.42	0.43	0.44	0.45	0.51
175	0.34	0.34	0.34	0.35	0.36	0.37	0.38	0.39	0.40	0.41	0.42	0.43	0.44	0.45	0.45	0.46	0.47	0.47	0.51
180	0.42	0.42	0.41	0.42	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.48	0.49	0.50	0.50	0.50	0.51	0.51	0.51

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	77.6	78.8	79.2	79.3	79.3	79.3	79.4	79.4	79.4	79.5	79.4	79.2	79.0	78.8	78.7	78.5	78.4	78.5	78.7
5	66.0	62.0	58.2	54.4	50.8	47.2	43.7	40.6	37.7	35.4	33.6	33.0	32.9	33.1	33.3	33.5	33.8	33.5	33.3
10	56.9	49.7	42.0	36.3	33.6	36.7	43.7	54.6	71.5	90.3	109	123	135	145	153	158	161	158	153
15	41.5	36.4	38.5	48.8	67.5	104	143	178	190	193	189	182	171	159	145	134	126	134	145
20	30.7	35.3	71.9	116	157	168	168	157	133	106	83.6	83.7	89.6	97.5	97.1	95.7	94.0	95.7	97.1
25	41.4	49.2	89.4	133	168	153	125	94.2	81.3	72.3	65.9	59.3	54.1	50.4	48.9	48.5	48.9	48.5	48.9
30	77.0	82.8	93.9	103	108	97.4	82.3	66.5	58.1	52.3	48.9	49.0	50.5	52.4	52.1	51.6	51.1	51.6	52.1
35	112	121	119	110	96.5	79.8	63.3	49.6	48.1	49.7	52.1	49.0	45.0	40.8	37.7	35.3	34.0	35.3	37.7
40	119	126	112	90.4	67.7	60.3	55.7	52.2	44.4	36.4	29.1	24.6	21.3	19.0	17.3	16.3	16.0	16.3	17.3
45	98.9	103	91.1	73.4	54.6	46.7	41.0	36.2	28.9	21.9	15.8	12.2	9.83	8.32	7.24	6.70	6.62	6.70	7.24
50	78.5	80.8	73.2	61.3	47.7	37.5	28.2	20.3	14.5	10.2	7.16	5.16	3.96	3.35	2.89	2.71	2.73	2.71	2.89
55	63.1	63.5	56.4	46.1	34.6	25.6	17.7	11.2	7.44	5.10	3.75	2.61	1.95	1.62	1.42	1.37	1.43	1.37	1.42
60	50.6	49.0	41.4	31.8	21.8	15.6	10.7	7.01	4.63	3.11	2.21	1.46	1.00	0.77	0.64	0.61	0.65	0.61	0.64
65	38.6	36.0	28.8	20.4	12.2	8.29	5.69	4.09	2.84	2.04	1.55	1.01	0.61	0.34	0.23	0.22	0.26	0.22	0.23
70	26.8	23.6	18.3	12.6	7.49	5.17	3.82	3.09	2.28	1.68	1.24	0.79	0.43	0.19	0.12	0.14	0.19	0.14	0.12
75	17.3	14.5	11.1	7.74	4.88	3.63	2.95	2.62	2.07	1.60	1.21	0.83	0.52	0.30	0.25	0.26	0.30	0.26	0.25
80	9.16	7.63	6.19	4.92	3.87	3.22	2.75	2.38	1.93	1.53	1.16	0.85	0.60	0.43	0.39	0.40	0.44	0.40	0.39
85	5.71	5.22	4.53	3.80	3.12	2.71	2.37	2.08	1.73	1.40	1.10	0.86	0.67	0.55	0.52	0.53	0.56	0.53	0.52
90	3.40	3.32	3.02	2.65	2.27	2.06	1.88	1.71	1.46	1.22	1.00	0.84	0.73	0.65	0.64	0.65	0.67	0.65	0.64
95	2.51	2.42	2.20	1.94	1.68	1.54	1.43	1.32	1.15	0.99	0.85	0.78	0.74	0.72	0.72	0.73	0.74	0.73	0.72
100	2.19	2.01	1.80	1.60	1.42	1.32	1.23	1.15	1.03	0.92	0.83	0.79	0.78	0.77	0.78	0.79	0.80	0.79	0.78
105	1.90	1.78	1.62	1.46	1.32	1.23	1.16	1.10	1.00	0.92	0.85	0.82	0.81	0.81	0.82	0.82	0.83	0.82	0.82
110	1.68	1.58	1.46	1.33	1.22	1.16	1.11	1.06	0.98	0.90	0.84	0.81	0.81	0.81	0.81	0.82	0.82	0.82	0.81
115	1.48	1.42	1.32	1.22	1.13	1.08	1.05	1.01	0.95	0.88	0.82	0.80	0.80	0.80	0.80	0.80	0.81	0.80	0.80
120	1.35	1.35	1.28	1.18	1.09	1.05	1.02	0.99	0.93	0.87	0.82	0.80	0.80	0.80	0.79	0.80	0.80	0.79	0.79
125	1.27	1.29	1.23	1.14	1.05	1.02	1.00	0.99	0.94	0.89	0.85	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.84
130	1.13	1.16	1.13	1.08	1.02	1.00	0.99	0.97	0.94	0.91	0.88	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89
135	1.08	1.12	1.10	1.05	0.99	0.97	0.95	0.93	0.91	0.89	0.88	0.89	0.90	0.92	0.92	0.92	0.92	0.92	0.92
140	0.98	1.01	1.00	0.97	0.93	0.91	0.89	0.87	0.86	0.86	0.86	0.88	0.90	0.91	0.92	0.92	0.92	0.92	0.92
145	0.88	0.93	0.93	0.91	0.89	0.86	0.83	0.81	0.81	0.82	0.83	0.85	0.87	0.89	0.89	0.90	0.90	0.90	0.89
150	0.83	0.87	0.87	0.84	0.80	0.78	0.77	0.76	0.77	0.78	0.80	0.81	0.82	0.83	0.84	0.84	0.85	0.84	0.84
155	0.75	0.79	0.79	0.77	0.74	0.73	0.72	0.72	0.73	0.74	0.75	0.75	0.75	0.75	0.75	0.75	0.74	0.75	0.75
160	0.69	0.74	0.74	0.72	0.70	0.70	0.71	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.67	0.66	0.64	0.66	0.67
165	0.62	0.66	0.67	0.66	0.65	0.66	0.67	0.67	0.66	0.65	0.63	0.61	0.59	0.57	0.56	0.54	0.53	0.54	0.56
170	0.56	0.59	0.59	0.59	0.58	0.58	0.58	0.57	0.54	0.52	0.48	0.45	0.42	0.39	0.38	0.37	0.38	0.37	0.38
175	0.54	0.56	0.56	0.55	0.54	0.54	0.53	0.52	0.50	0.47	0.44	0.42	0.40	0.39	0.39	0.39	0.40	0.39	0.39
180	0.49	0.49	0.48	0.48	0.49	0.49	0.49	0.49	0.49	0.48	0.47	0.45	0.44	0.43	0.42	0.41	0.41	0.41	0.42

C(DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	78.8	79.0	79.2	79.4	79.5	79.4	79.4	79.4	79.3	79.3	79.3	79.2	78.8	77.6	76.1				
5	33.1	32.9	33.0	33.6	35.4	37.7	40.6	43.7	47.2	50.8	54.4	58.2	62.0	66.0	70.0				
10	145	135	123	109	90.3	71.5	54.6	43.7	36.7	33.6	36.3	42.0	49.7	56.9	65.1				
15	159	171	182	189	193	190	178	143	104	67.5	48.8	38.5	36.4	41.5	54.3				
20	97.5	89.6	83.7	83.6	106	133	157	168	168	157	116	71.9	35.3	30.7	44.0				
25	50.4	54.1	59.3	65.9	72.3	81.3	94.2	125	153	168	133	89.4	49.2	41.4	49.6				
30	52.4	50.5	49.0	48.9	52.3	58.1	66.5	82.3	97.4	108	103	93.9	82.8	77.0	72.7				
35	40.8	45.0	49.0	52.1	49.7	48.1	49.6	63.3	79.8	96.5	110	119	121	112	93.8				
40	19.0	21.3	24.6	29.1	36.4	44.4	52.2	55.7	60.3	67.7	90.4	112	126	119	98.2				
45	8.32	9.83	12.2	15.8	21.9	28.9	36.2	41.0	46.7	54.6	73.4	91.1	103	98.9	84.6				
50	3.35	3.96	5.16	7.16	10.2	14.5	20.3	28.2	37.5	47.7	61.3	73.2	80.8	78.5	69.5				
55	1.62	1.95	2.61	3.75	5.10	7.44	11.2	17.7	25.6	34.6	46.1	56.4	63.5	63.1	57.8				
60	0.77	1.00	1.46	2.21	3.11	4.63	7.01	10.7	15.6	21.8	31.8	41.4	49.0	50.6	48.4				
65	0.34	0.61	1.01	1.55	2.04	2.84	4.09	5.69	8.29	12.2	20.4	28.8	36.0	38.6	38.6				
70	0.19	0.43	0.79	1.24	1.68	2.28	3.09	3.82	5.17	7.49	12.6	18.3	23.6	26.8	28.8				
75	0.30	0.52	0.83	1.21	1.60	2.07	2.62	2.95	3.63	4.88	7.74	11.1	14.5	17.3	19.8				
80	0.43	0.60	0.85	1.16	1.53	1.93	2.38	2.75	3.22	3.87	4.92	6.19	7.63	9.16	10.8				
85	0.55	0.67	0.86	1.10	1.40	1.73	2.08	2.37	2.71	3.12	3.80	4.53	5.22	5.71	6.09				
90	0.65	0.73	0.84	1.00	1.22	1.46	1.71	1.88	2.06	2.27	2.65	3.02	3.32	3.40	3.35				
95	0.72	0.74	0.78	0.85	0.99	1.15	1.32	1.43	1.54	1.68	1.94	2.20	2.42	2.51	2.52				
100	0.77	0.78	0.79	0.83	0.92	1.03	1.15	1.23	1.32	1.42	1.60	1.80	2.01	2.19	2.36				
105	0.81	0.81	0.82	0.85	0.92	1.00	1.10	1.16	1.23	1.32	1.46	1.62	1.78	1.90	2.01				
110	0.81	0.81	0.81	0.84	0.90	0.98	1.06	1.11	1.16	1.22	1.33	1.46	1.58	1.68	1.76				
115	0.80	0.80	0.80	0.82	0.88	0.95	1.01	1.05	1.08	1.13	1.22	1.32	1.42	1.48	1.52				
120	0.80	0.80	0.80	0.82	0.87	0.93	0.99	1.02	1.05	1.09	1.18	1.28	1.35	1.35	1.32				
125	0.84	0.84	0.84	0.85	0.89	0.94	0.99	1.00	1.02	1.05	1.14	1.23	1.29	1.27	1.20				
130	0.89	0.88	0.88	0.88	0.91	0.94	0.97	0.99	1.00	1.02	1.08	1.13	1.16	1.13	1.06				
135	0.92	0.90	0.89	0.88	0.89	0.91	0.93	0.95	0.97	0.99	1.05	1.10	1.12	1.08	1.00				
140	0.91	0.90	0.88	0.86	0.86	0.86	0.87	0.89	0.91	0.93	0.97	1.00	1.01	0.98	0.90				
145	0.89	0.87	0.85	0.83	0.82	0.81	0.81	0.83	0.86	0.89	0.91	0.93	0.93	0.88	0.81				
150	0.83	0.82	0.81	0.80	0.78	0.77	0.76	0.77	0.78	0.80	0.84	0.87	0.87	0.83	0.75				
155	0.75	0.75	0.75	0.75	0.74	0.73	0.72	0.72	0.73	0.74	0.77	0.79	0.79	0.75	0.67				
160	0.69	0.70	0.70	0.71	0.71	0.72	0.72	0.71	0.70	0.70	0.72	0.74	0.74	0.69	0.62				
165	0.57	0.59	0.61	0.63	0.65	0.66	0.67	0.67	0.66	0.65	0.66	0.67	0.66	0.62	0.55				
170	0.39	0.42	0.45	0.48	0.52	0.54	0.57	0.58	0.58	0.58	0.59	0.59	0.59	0.56	0.51				
175	0.39	0.40	0.42	0.44	0.47	0.50	0.52	0.53	0.54	0.54	0.55	0.56	0.56	0.54	0.51				
180	0.43	0.44	0.45	0.47	0.48	0.49	0.49	0.49	0.49	0.49	0.48	0.48	0.49	0.49	0.50				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34L @ 150W / 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	1.212	145.0	0.997	3.43
277.0	60	0.543	141.0	0.937	8.45

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*****