

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		16696
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		164.5
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		16090
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	158.5
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		101.5
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	3.73
			277V	12.39
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
			277V	0.894
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	3925
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		75.3
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-23
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		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		0.850
(Goniophotometer – Section 4.2)		Non-Worst Case		0.399
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		101.5
(Goniophotometer – Section 4.2)		Non-Worst Case		98.7

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-12	W34L @ 100W / 4000K	230612001-S1
2	Goniophotometer Test	2023-06-12	W34L @ 100W / 4000K	230612001-S1
3	THD and PF Test	2023-06-12	W34L @ 100W / 4000K	230612001-S1

Remark (If any)

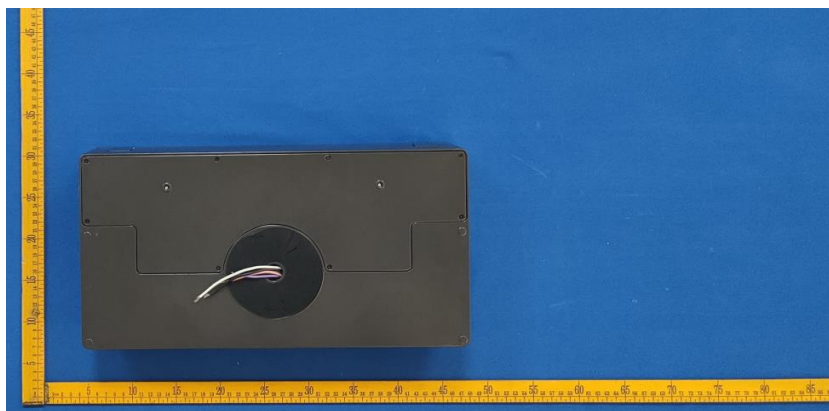
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34L @ 100W / 4000K, 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 / 4000K	Sample ID	230612001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

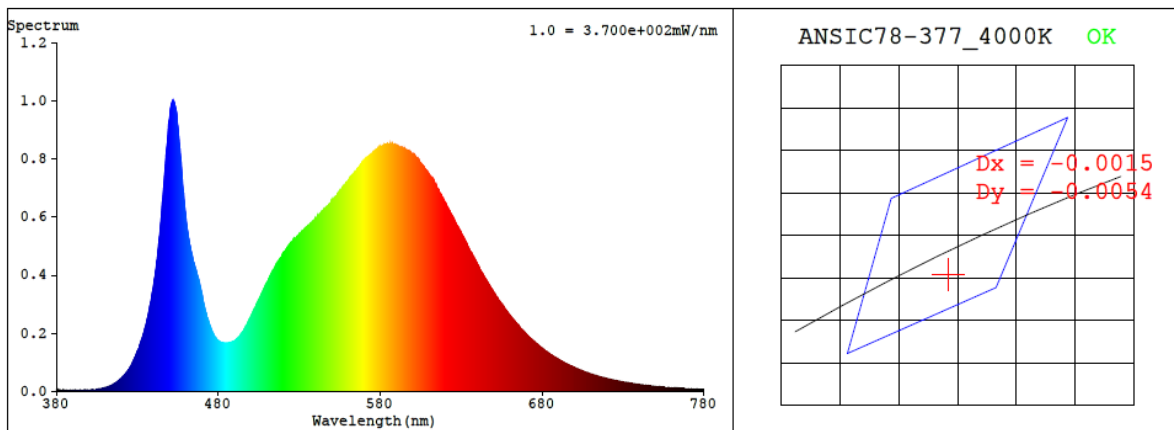
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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.</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	0.850	101.5	0.995
277.0	60	0.399	98.7	0.894

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3925	75.3	-23	-0.0021	77	93	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3823$ $y = 0.3734$ / $u' = 0.2277$ $v' = 0.5004$ ($duv = -2.10e-03$)

CCT= 3925K Prcp WL: Ld=580.5nm Purity=26.8%

Peak WL: Lp=452nm FWHM: =19.5nm Ratio:R=17.5% G=79.4% B=3.0%

Render Index: Ra = 75.3 AvgR = 66.2 TM30:Rf=77 Rg=93

EEL: 0.08255 A++ Highest

R1 =72 R2 =84 R3 =92 R4 =72 R5 =72 R6 =77 R7 =81

R8 =52 R9 =-23 R10=61 R11=68 R12=49 R13=75 R14=95 R15=66

4.1 Integrating Sphere Test

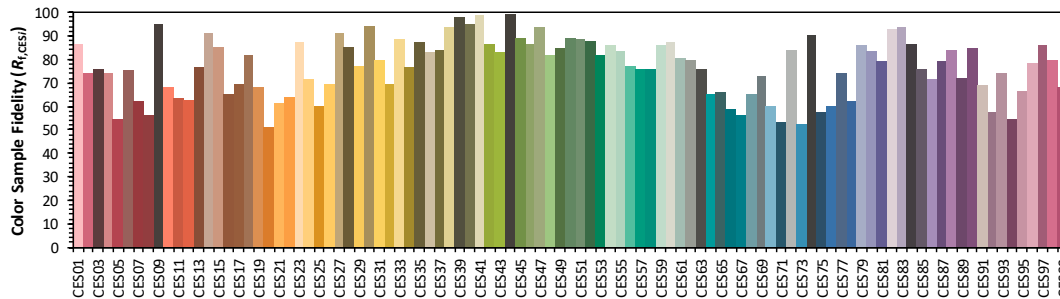
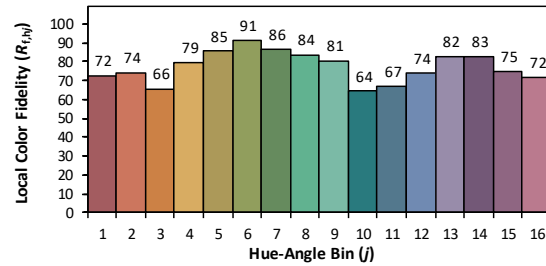
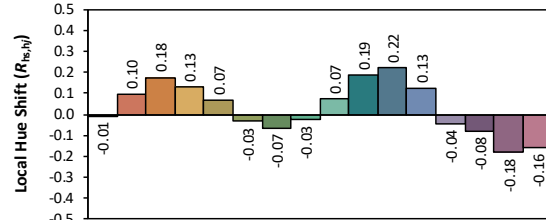
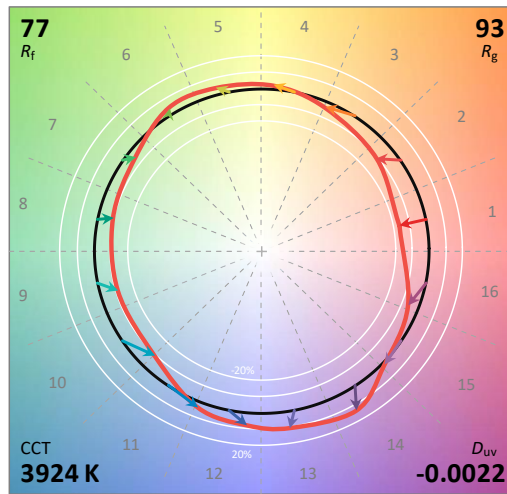
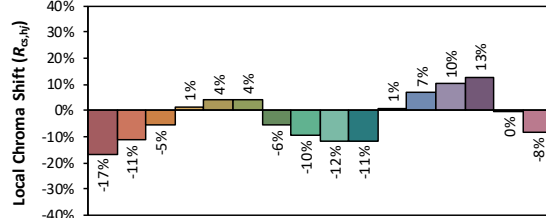
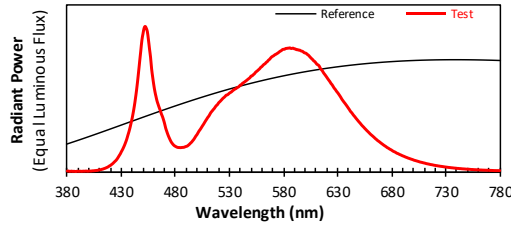
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/13

Model: W34L @ 100W / 4000K



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

x 0.3822
 y 0.3733
 u' 0.2277
 v' 0.5003

CIE 13.3-1995
(CRI)

R_a 75
 R_g -23

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	4.50E-06	447	7.63E-04	514	4.18E-04	581	8.43E-04	648	3.60E-04	715	5.15E-05
381	4.90E-06	448	8.33E-04	515	4.27E-04	582	8.47E-04	649	3.50E-04	716	4.97E-05
382	2.80E-06	449	9.04E-04	516	4.35E-04	583	8.48E-04	650	3.42E-04	717	4.84E-05
383	3.00E-06	450	9.48E-04	517	4.47E-04	584	8.50E-04	651	3.33E-04	718	4.72E-05
384	4.00E-06	451	9.86E-04	518	4.56E-04	585	8.50E-04	652	3.24E-04	719	4.52E-05
385	2.40E-06	452	1.00E-03	519	4.63E-04	586	8.52E-04	653	3.16E-04	720	4.39E-05
386	3.00E-06	453	9.87E-04	520	4.74E-04	587	8.48E-04	654	3.08E-04	721	4.26E-05
387	2.30E-06	454	9.65E-04	521	4.81E-04	588	8.49E-04	655	3.00E-04	722	4.16E-05
388	1.60E-06	455	9.11E-04	522	4.89E-04	589	8.50E-04	656	2.92E-04	723	4.00E-05
389	3.40E-06	456	8.47E-04	523	4.97E-04	590	8.45E-04	657	2.84E-04	724	3.90E-05
390	3.40E-06	457	7.88E-04	524	5.05E-04	591	8.44E-04	658	2.77E-04	725	3.76E-05
391	2.70E-06	458	7.07E-04	525	5.11E-04	592	8.39E-04	659	2.70E-04	726	3.67E-05
392	3.70E-06	459	6.50E-04	526	5.18E-04	593	8.40E-04	660	2.62E-04	727	3.57E-05
393	2.80E-06	460	5.97E-04	527	5.27E-04	594	8.36E-04	661	2.55E-04	728	3.46E-05
394	3.30E-06	461	5.53E-04	528	5.28E-04	595	8.36E-04	662	2.49E-04	729	3.33E-05
395	4.00E-06	462	5.18E-04	529	5.34E-04	596	8.32E-04	663	2.42E-04	730	3.23E-05
396	3.60E-06	463	4.87E-04	530	5.41E-04	597	8.29E-04	664	2.35E-04	731	3.14E-05
397	4.50E-06	464	4.64E-04	531	5.45E-04	598	8.26E-04	665	2.28E-04	732	3.03E-05
398	4.40E-06	465	4.41E-04	532	5.50E-04	599	8.19E-04	666	2.22E-04	733	2.92E-05
399	3.40E-06	466	4.21E-04	533	5.57E-04	600	8.17E-04	667	2.15E-04	734	2.87E-05
400	4.70E-06	467	3.98E-04	534	5.63E-04	601	8.14E-04	668	2.10E-04	735	2.76E-05
401	4.70E-06	468	3.80E-04	535	5.68E-04	602	8.07E-04	669	2.04E-04	736	2.69E-05
402	4.60E-06	469	3.57E-04	536	5.72E-04	603	8.02E-04	670	1.98E-04	737	2.62E-05
403	6.00E-06	470	3.31E-04	537	5.78E-04	604	7.94E-04	671	1.93E-04	738	2.52E-05
404	6.30E-06	471	3.00E-04	538	5.82E-04	605	7.86E-04	672	1.87E-04	739	2.46E-05
405	7.10E-06	472	2.78E-04	539	5.87E-04	606	7.78E-04	673	1.82E-04	740	2.38E-05
406	8.00E-06	473	2.56E-04	540	5.96E-04	607	7.71E-04	674	1.77E-04	741	2.27E-05
407	8.60E-06	474	2.38E-04	541	5.99E-04	608	7.62E-04	675	1.72E-04	742	2.26E-05
408	9.80E-06	475	2.22E-04	542	6.07E-04	609	7.57E-04	676	1.66E-04	743	2.14E-05
409	1.13E-05	476	2.07E-04	543	6.12E-04	610	7.48E-04	677	1.62E-04	744	2.13E-05
410	1.27E-05	477	1.96E-04	544	6.18E-04	611	7.39E-04	678	1.57E-04	745	2.02E-05
411	1.45E-05	478	1.86E-04	545	6.23E-04	612	7.35E-04	679	1.53E-04	746	1.97E-05
412	1.66E-05	479	1.79E-04	546	6.29E-04	613	7.27E-04	680	1.49E-04	747	1.92E-05
413	1.86E-05	480	1.75E-04	547	6.35E-04	614	7.13E-04	681	1.43E-04	748	1.87E-05
414	2.15E-05	481	1.71E-04	548	6.41E-04	615	7.02E-04	682	1.39E-04	749	1.78E-05
415	2.39E-05	482	1.68E-04	549	6.47E-04	616	6.94E-04	683	1.36E-04	750	1.76E-05
416	2.74E-05	483	1.67E-04	550	6.58E-04	617	6.81E-04	684	1.32E-04	751	1.70E-05
417	3.06E-05	484	1.66E-04	551	6.59E-04	618	6.71E-04	685	1.27E-04	752	1.67E-05
418	3.49E-05	485	1.66E-04	552	6.67E-04	619	6.61E-04	686	1.25E-04	753	1.60E-05
419	4.01E-05	486	1.67E-04	553	6.73E-04	620	6.50E-04	687	1.20E-04	754	1.53E-05
420	4.41E-05	487	1.67E-04	554	6.83E-04	621	6.39E-04	688	1.17E-04	755	1.53E-05
421	5.01E-05	488	1.68E-04	555	6.89E-04	622	6.29E-04	689	1.14E-04	756	1.44E-05
422	5.59E-05	489	1.71E-04	556	6.95E-04	623	6.19E-04	690	1.10E-04	757	1.41E-05
423	6.32E-05	490	1.74E-04	557	7.02E-04	624	6.07E-04	691	1.07E-04	758	1.38E-05
424	7.07E-05	491	1.77E-04	558	7.09E-04	625	5.98E-04	692	1.04E-04	759	1.31E-05
425	7.77E-05	492	1.83E-04	559	7.18E-04	626	5.86E-04	693	1.01E-04	760	1.30E-05
426	8.70E-05	493	1.89E-04	560	7.23E-04	627	5.74E-04	694	9.81E-05	761	1.25E-05
427	9.84E-05	494	1.97E-04	561	7.32E-04	628	5.65E-04	695	9.47E-05	762	1.20E-05
428	1.11E-04	495	2.04E-04	562	7.39E-04	629	5.54E-04	696	9.23E-05	763	1.19E-05
429	1.23E-04	496	2.13E-04	563	7.43E-04	630	5.45E-04	697	8.95E-05	764	1.14E-05
430	1.38E-04	497	2.22E-04	564	7.52E-04	631	5.35E-04	698	8.69E-05	765	1.10E-05
431	1.51E-04	498	2.34E-04	565	7.57E-04	632	5.24E-04	699	8.46E-05	766	1.08E-05
432	1.67E-04	499	2.46E-04	566	7.67E-04	633	5.12E-04	700	8.18E-05	767	1.05E-05
433	1.84E-04	500	2.56E-04	567	7.72E-04	634	4.99E-04	701	7.87E-05	768	1.02E-05
434	2.03E-04	501	2.69E-04	568	7.81E-04	635	4.89E-04	702	7.70E-05	769	9.80E-06
435	2.24E-04	502	2.81E-04	569	7.89E-04	636	4.79E-04	703	7.46E-05	770	9.80E-06
436	2.50E-04	503	2.91E-04	570	7.94E-04	637	4.69E-04	704	7.25E-05	771	9.30E-06
437	2.75E-04	504	3.03E-04	571	7.98E-04	638	4.59E-04	705	7.01E-05	772	9.00E-06
438	3.03E-04	505	3.15E-04	572	8.05E-04	639	4.49E-04	706	6.77E-05	773	8.80E-06
439	3.35E-04	506	3.26E-04	573	8.08E-04	640	4.38E-04	707	6.56E-05	774	8.40E-06
440	3.68E-04	507	3.39E-04	574	8.13E-04	641	4.27E-04	708	6.42E-05	775	8.00E-06
441	4.08E-04	508	3.51E-04	575	8.18E-04	642	4.15E-04	709	6.21E-05	776	7.90E-06
442	4.51E-04	509	3.62E-04	576	8.24E-04	643	4.07E-04	710	6.03E-05	777	7.70E-06
443	5.02E-04	510	3.74E-04	577	8.29E-04	644	3.97E-04	711	5.86E-05	778	7.80E-06
444	5.58E-04	511	3.83E-04	578	8.33E-04	645	3.87E-04	712	5.61E-05	779	7.70E-06
445	6.22E-04	512	3.97E-04	579	8.40E-04	646	3.78E-04	713	5.46E-05	780	7.70E-06
446	6.91E-04	513	4.09E-04	580	8.42E-04	647	3.68E-04	714	5.31E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34L @ 100W / 4000K	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	0.850	101.5	0.995
NON-WORST CASE	277.0	60	0.399	98.7	0.894

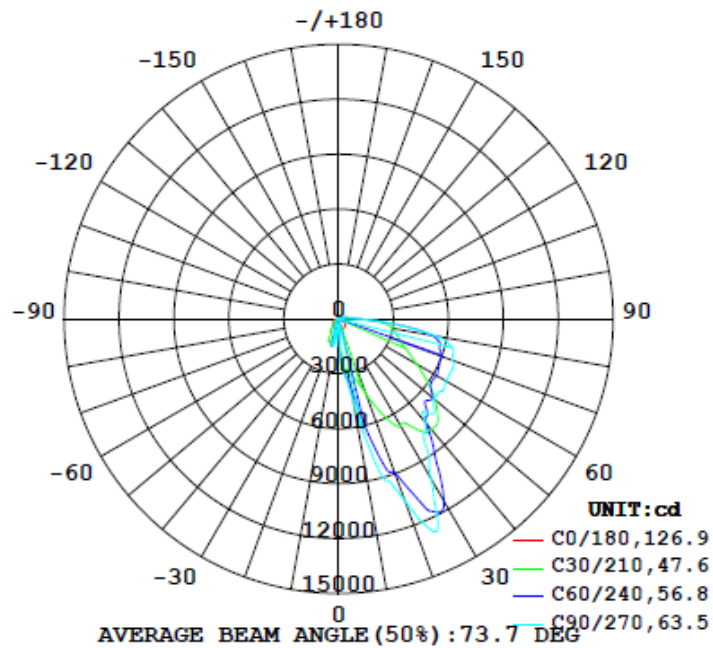
Test Result

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	16696	103.9	134.0	63.2	83.7	164.5	7.3%	B1-U3-G5
0°-90° zones	16090	103.9	134.0	63.2	83.7	158.5	7.6%	B1-U3-G5

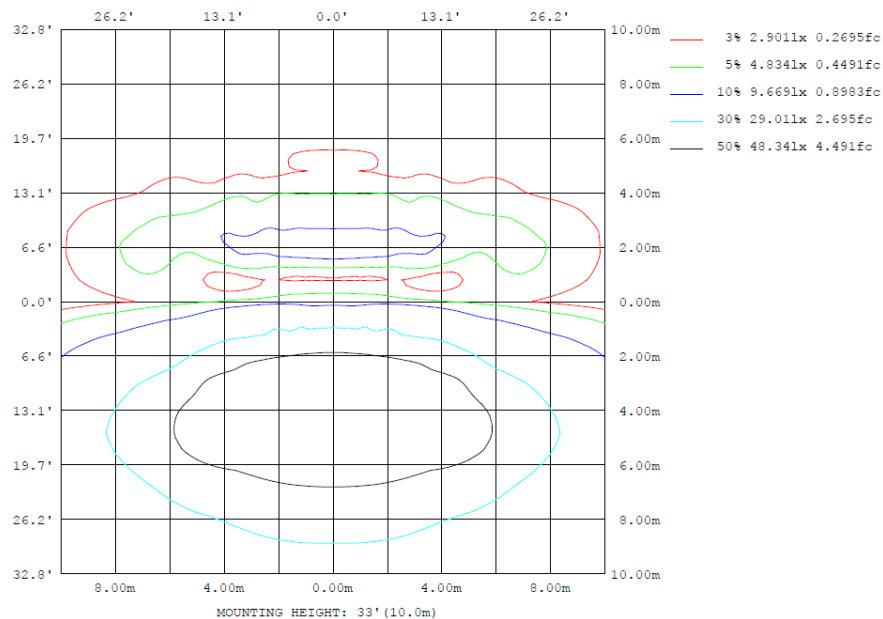
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

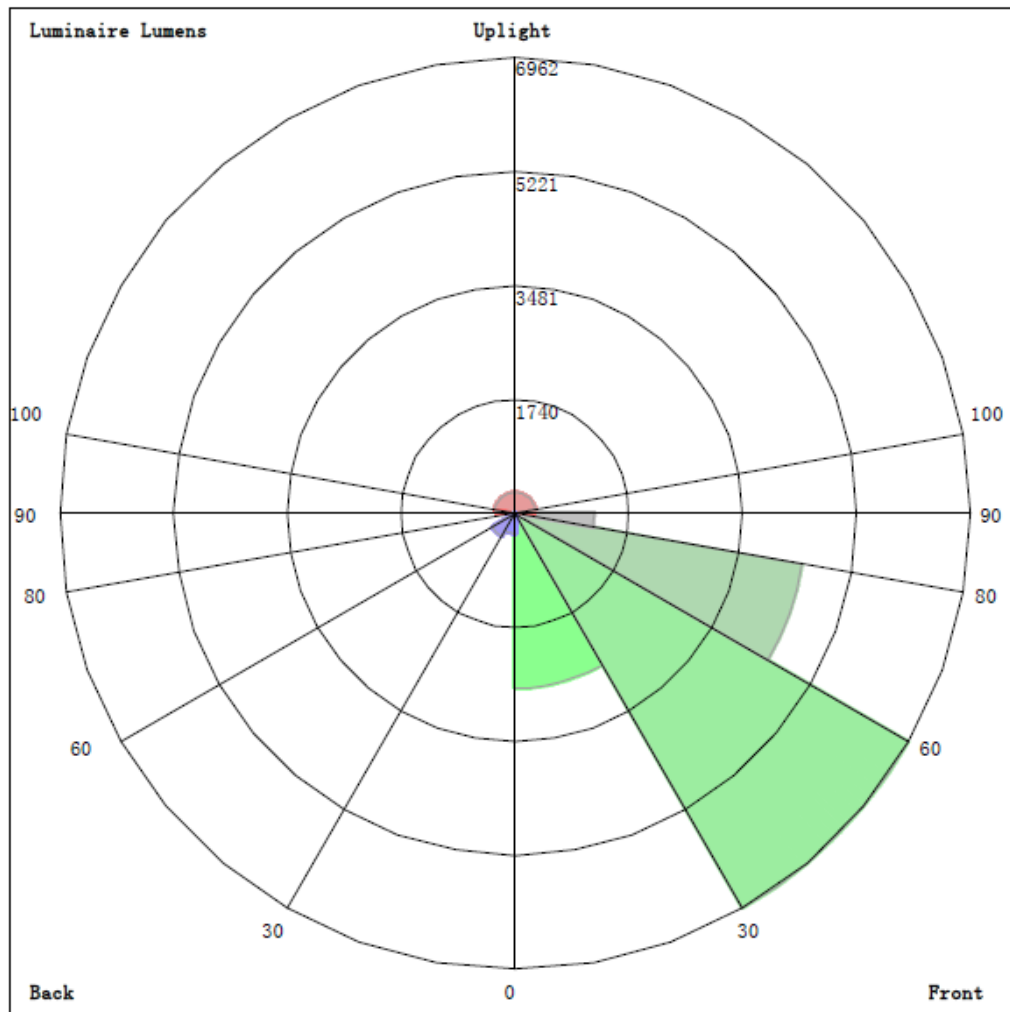
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	62.04	332.1	463.0	332.1	62.04	45.96	130.5	45.96	0- 10	142.2	142.2	0.85, 0.85
20	62.57	744.4	1057	744.4	62.57	127.1	75.91	127.1	10- 20	866.0	1008	6.04, 6.04
30	58.18	1069	1010	1069	58.18	55.03	41.98	55.03	20- 30	1965	2973	17.8, 17.8
40	53.14	901.6	738.2	901.6	53.14	42.60	13.14	42.60	30- 40	2447	5420	32.5, 32.5
50	44.32	619.3	679.4	619.3	44.32	16.53	2.299	16.53	40- 50	2478	7898	47.3, 47.3
60	35.10	542.9	680.8	542.9	35.10	5.609	0.5312	5.609	50- 60	2436	10334	61.9, 61.9
70	24.57	508.4	662.9	508.4	24.57	2.564	0.1525	2.564	60- 70	2358	12692	76, 76
80	10.56	455.2	537.9	455.2	10.56	1.984	0.3530	1.984	70- 80	2182	14873	89.1, 89.1
90	2.611	107.8	116.0	107.8	2.611	1.419	0.5393	1.419	80- 90	1217	16090	96.4, 96.4
100	2.087	39.03	53.32	39.03	2.087	0.9464	0.6442	0.9464	90-100	287.8	16378	98.1, 98.1
110	1.529	17.34	24.88	17.34	1.529	0.8685	0.6660	0.8685	100-110	134.9	16513	98.9, 98.9
120	1.048	14.11	16.77	14.11	1.048	0.8142	0.6452	0.8142	110-120	71.82	16585	99.3, 99.3
130	0.8060	8.961	16.37	8.961	0.8060	0.7934	0.7205	0.7934	120-130	50.29	16635	99.6, 99.6
140	0.6623	5.847	9.852	5.847	0.6623	0.7137	0.7491	0.7137	130-140	33.23	16669	99.8, 99.8
150	0.5221	3.886	6.259	3.886	0.5221	0.6215	0.6869	0.6215	140-150	16.52	16685	99.9, 99.9
160	0.4208	2.392	3.465	2.392	0.4208	0.5853	0.5242	0.5853	150-160	7.934	16693	100, 100
170	0.3613	0.2666	0.8972	0.2666	0.3613	0.4617	0.3064	0.4617	160-170	2.553	16696	100, 100
180	0.4118	0.3749	0.3564	0.3749	0.4118	0.4009	0.3361	0.4009	170-180	0.3376	16696	100, 100
DEG	LUMINOUS INTENSITY:×10cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	142.20	0-10	142.20	0.85%
10-20	865.96	0-20	1008.16	6.04%
20-30	1965.00	0-30	2973.16	17.81%
30-40	2446.93	0-40	5420.09	32.46%
40-50	2477.52	0-50	7897.61	47.30%
50-60	2436.29	0-60	10333.90	61.90%
60-70	2357.85	0-70	12691.75	76.02%
70-80	2181.74	0-80	14873.49	89.09%
80-90	1217.00	0-90	16090.49	96.38%
90-100	287.81	0-100	16378.30	98.10%
100-110	134.94	0-110	16513.24	98.91%
110-120	71.82	0-120	16585.06	99.34%
120-130	50.29	0-130	16635.35	99.64%
130-140	33.23	0-140	16668.58	99.84%
140-150	16.52	0-150	16685.10	99.94%
150-160	7.93	0-160	16693.03	99.98%
160-170	2.55	0-170	16695.58	100.00%
170-180	0.34	0-180	16695.92	100.00%

4.2 Goniophotometer Test

LCS/BUG

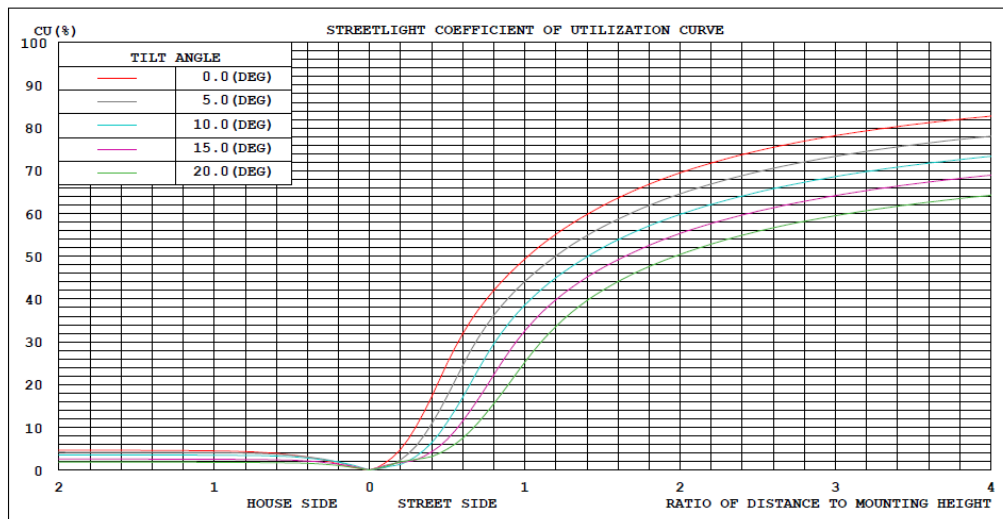


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

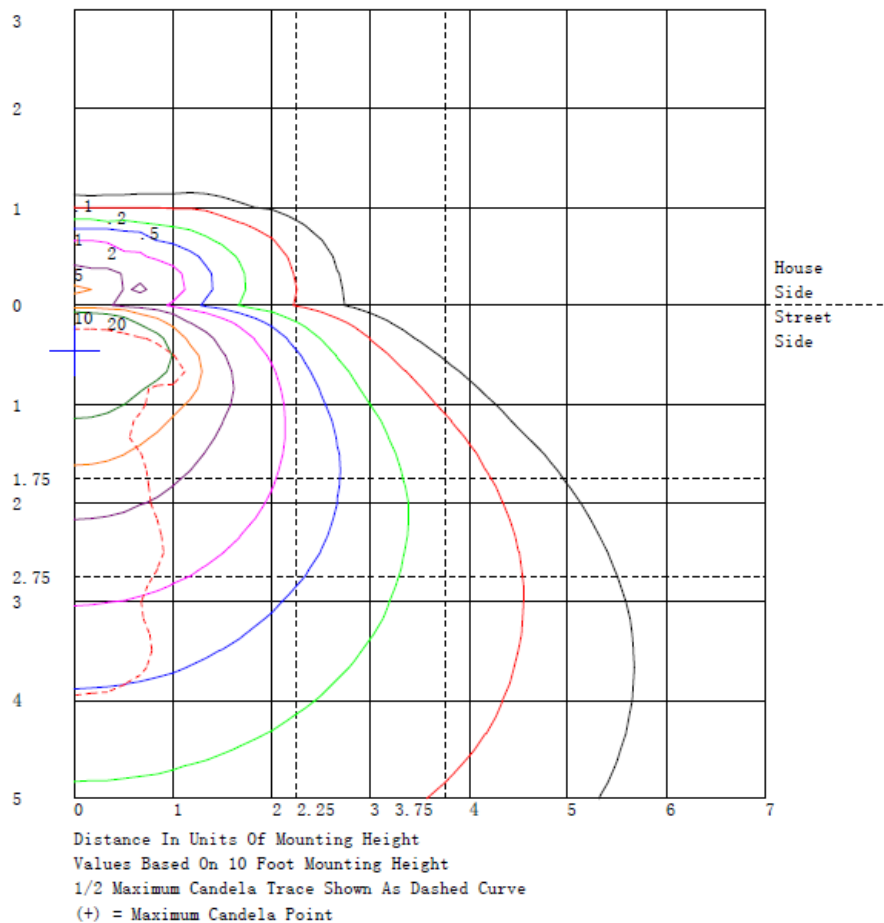
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	2669.9	N.A.	16.0
FM - Front-Medium (30-60)	6961.6	N.A.	41.7
FH - Front-High (60-80)	4463.7	N.A.	26.7
FVH - Front-Very High (80-90)	1204.9	N.A.	7.2
BL - Back-Low (0-30)	303.2	N.A.	1.8
BM - Back-Medium (30-60)	399.2	N.A.	2.4
BH - Back-High (60-80)	75.9	N.A.	0.5
BVH - Back-Very High (80-90)	12.1	N.A.	0.1
UL - Uplight-Low (90-100)	287.8	N.A.	1.7
UH - Uplight-High (100-180)	317.6	N.A.	1.9
Total	16695.9	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) γ (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	62.2	62.3	62.4	62.5	62.7	62.9	63.2	63.3	63.4	63.6	63.8	64.0	64.2	64.6	64.9	65.3	65.5	65.8	66.0
5	62.1	74.8	93.1	117	151	187	222	246	266	279	282	280	277	275	274	274	275	276	277
10	62.0	133	191	235	258	272	282	299	316	332	347	361	377	399	421	440	453	460	463
15	62.5	154	227	282	305	319	335	378	430	488	555	621	685	736	779	814	839	855	862
20	62.6	149	225	291	335	379	432	534	642	744	805	852	892	940	984	1020	1041	1053	1057
25	61.1	137	218	302	394	488	583	675	768	862	966	1065	1151	1203	1238	1260	1273	1278	1276
30	58.2	128	210	306	420	543	673	819	955	1069	1125	1150	1150	1125	1090	1052	1030	1016	1010
35	55.8	134	226	332	461	597	732	868	981	1057	1036	984	920	894	873	857	839	824	817
40	53.1	143	246	362	513	661	790	860	896	902	858	800	745	739	744	753	749	743	738
45	49.8	145	251	366	517	658	768	779	756	717	697	681	672	681	695	711	722	730	733
50	44.3	123	213	314	454	584	687	686	656	619	631	649	669	673	674	674	676	678	679
55	39.0	125	214	304	411	510	588	604	600	588	594	604	615	631	647	662	676	685	690
60	35.1	111	188	264	349	427	492	519	533	543	569	595	620	638	653	664	673	679	681
65	29.7	91.6	154	218	288	355	416	461	498	529	558	584	606	626	643	657	668	675	678
70	24.6	62.1	107	159	225	293	360	416	465	508	544	573	598	618	635	647	656	661	663
75	18.3	39.5	72.9	119	185	257	329	388	440	485	520	548	572	596	616	632	642	647	648
80	10.6	24.7	52.2	93.0	155	225	296	356	410	455	484	504	517	527	533	536	538	539	538
85	5.28	14.6	35.8	68.7	125	184	238	265	281	288	291	291	288	286	285	283	282	280	279
90	2.61	10.3	21.0	34.7	55.2	76.0	94.4	102	106	108	111	113	115	116	117	117	117	116	116
95	2.03	5.77	10.7	16.9	25.5	34.3	42.5	47.1	50.6	53.4	56.9	60.0	62.7	64.5	65.7	66.4	66.9	67.1	67.1
100	2.09	4.62	7.68	11.2	15.5	20.2	25.0	29.9	34.6	39.0	42.9	46.2	48.9	50.6	51.8	52.5	53.1	53.3	53.3
105	1.74	3.59	5.71	8.10	11.0	14.0	17.0	19.0	20.9	23.1	26.4	30.0	33.4	36.5	39.1	41.1	42.0	42.3	42.1
110	1.53	2.95	4.58	6.44	8.75	11.1	13.3	14.8	16.1	17.3	19.2	21.1	22.7	23.7	24.4	24.8	25.0	25.0	24.9
115	1.29	2.32	3.60	5.13	7.14	9.22	11.2	12.5	13.5	14.5	15.5	16.5	17.5	18.7	19.9	20.8	21.1	21.1	21.0
120	1.05	1.88	2.90	4.11	5.58	7.20	8.90	10.8	12.6	14.1	14.6	14.8	14.9	15.5	16.1	16.7	16.8	16.8	16.8
125	0.89	1.54	2.35	3.33	4.50	5.82	7.27	8.96	10.7	12.3	13.5	14.6	15.3	15.6	15.6	15.5	15.3	15.2	15.1
130	0.81	1.34	2.01	2.81	3.82	4.90	6.01	6.87	7.82	8.96	10.9	12.9	14.7	15.8	16.6	17.0	16.9	16.6	16.4
135	0.74	1.18	1.73	2.39	3.23	4.13	5.01	5.67	6.32	7.02	7.87	8.84	9.92	11.3	12.7	14.0	14.8	15.3	15.4
140	0.66	0.98	1.39	1.91	2.59	3.32	4.06	4.68	5.27	5.85	6.47	7.08	7.67	8.24	8.76	9.21	9.54	9.76	9.85
145	0.59	0.44	0.53	0.87	1.62	2.48	3.36	3.90	4.37	4.81	5.35	5.88	6.37	6.74	7.05	7.29	7.47	7.59	7.63
150	0.52	0.32	0.34	0.60	1.22	1.97	2.72	3.16	3.54	3.89	4.31	4.72	5.10	5.44	5.73	5.97	6.13	6.22	6.26
155	0.47	0.29	0.30	0.48	0.95	1.51	2.10	2.52	2.89	3.20	3.46	3.67	3.85	4.03	4.19	4.33	4.47	4.56	4.62
160	0.42	0.37	0.36	0.39	0.42	0.52	0.73	1.26	1.84	2.39	2.66	2.84	2.97	3.11	3.22	3.32	3.39	3.44	3.47
165	0.38	0.37	0.36	0.35	0.30	0.28	0.31	0.50	0.76	1.06	1.42	1.76	2.06	2.20	2.28	2.32	2.36	2.39	2.41
170	0.36	0.35	0.35	0.34	0.33	0.31	0.30	0.29	0.28	0.27	0.25	0.24	0.24	0.24	0.27	0.33	0.34	0.35	0.36
175	0.38	0.38	0.37	0.37	0.36	0.36	0.35	0.34	0.33	0.32	0.31	0.31	0.30	0.29	0.28	0.28	0.28	0.27	0.28
180	0.41	0.41	0.41	0.41	0.40	0.40	0.39	0.39	0.38	0.37	0.37	0.36	0.35	0.34	0.34	0.34	0.34	0.35	0.36

		UNIT: $\times 10^{\text{cd}}$																	
C (DBG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	65.8	65.5	65.3	64.9	64.6	64.2	64.0	63.8	63.6	63.4	63.3	63.2	62.9	62.7	62.5	62.4	62.3	62.2	64.0
5	276	275	274	274	275	277	280	282	279	266	246	222	187	151	117	93.1	74.8	62.1	58.6
10	460	453	440	421	399	377	361	347	332	316	299	282	272	258	235	191	133	62.0	54.5
15	855	839	814	779	736	685	621	555	488	430	378	335	319	305	282	227	154	62.5	45.7
20	1053	1041	1020	984	940	892	852	805	744	642	534	432	379	335	291	225	149	62.6	37.0
25	1278	1273	1260	1238	1203	1151	1065	966	862	768	675	583	488	394	302	218	137	61.1	41.7
30	1016	1030	1052	1090	1125	1150	1150	1125	1069	955	819	673	543	420	306	210	128	58.2	61.1
35	824	839	857	873	894	920	984	1036	1057	981	868	732	597	461	332	226	134	55.8	77.9
40	743	749	753	744	739	745	800	858	902	896	860	790	661	513	362	246	143	53.1	80.5
45	730	722	711	695	681	672	681	697	717	756	779	768	658	517	366	251	145	49.8	69.6
50	678	676	674	674	673	669	649	631	619	656	686	687	584	454	314	213	123	44.3	56.8
55	685	676	662	647	631	615	604	594	588	600	604	588	510	411	304	214	125	39.0	47.7
60	679	673	664	653	638	620	595	569	543	533	519	492	427	349	264	188	111	35.1	40.0
65	675	668	657	643	626	606	584	558	529	498	461	416	355	288	218	154	91.6	29.7	31.8
70	661	656	647	635	618	598	573	544	508	465	416	360	293	225	159	107	62.1	24.6	23.9
75	647	642	632	616	596	572	548	520	485	440	388	329	257	185	119	72.9	39.5	18.3	16.6
80	539	538	536	533	527	517	504	484	455	410	356	296	225	155	93.0	52.2	24.7	10.6	9.11
85	280	282	283	285	286	288	291	291	288	281	265	238	184	125	68.7	35.8	14.6	5.28	5.09
90	116	117	117	117	116	115	113	111	108	106	102	94.4	76.0	55.2	34.7	21.0	10.3	2.61	2.75
95	67.1	66.9	66.4	65.7	64.5	62.7	60.0	56.9	53.4	50.6	47.1	42.5	34.3	25.5	16.9	10.7	5.77	2.03	2.10
100	53.3	53.1	52.5	51.8	50.6	48.9	46.2	42.9	39.0	34.6	29.9	25.0	20.2	15.5	11.2	7.68	4.62	2.09	1.97
105	42.3	42.0	41.1	39.1	36.5	33.4	30.0	26.4	23.1	20.9	19.0	17.0	14.0	11.0	8.10	5.71	3.59	1.74	1.67
110	25.0	25.0	24.8	24.4	23.7	22.7	21.1	19.2	17.3	16.1	14.8	13.3	11.1	8.75	6.44	4.58	2.95	1.53	1.47
115	21.1	21.1	20.8	19.9	18.7	17.5	16.5	15.5	14.5	13.5	12.5	11.2	9.22	7.14	5.13	3.60	2.32	1.29	1.27
120	16.8	16.8	16.7	16.1	15.5	14.9	14.8	14.6	14.1	12.6	10.8	8.90	7.20	5.58	4.11	2.90	1.88	1.05	1.12
125	15.2	15.3	15.5	15.6	15.6	15.3	14.6	13.5	12.3	10.7	8.96	7.27	5.82	4.50	3.33	2.35	1.54	0.89	1.03
130	16.6	16.9	17.0	16.6	15.8	14.7	12.9	10.9	8.96	7.82	6.87	6.01	4.90	3.82	2.81	2.01	1.34	0.81	0.92
135	15.3	14.8	14.0	12.7	11.3	9.92	8.84	7.87	7.02	6.32	5.67	5.01	4.13	3.23	2.39	1.73	1.18	0.74	0.82
140	9.76	9.54	9.21	8.76	8.24	7.67	7.08	6.47	5.85	5.27	4.68	4.06	3.32	2.59	1.91	1.39	0.98	0.66	0.76
145	7.59	7.47	7.29	7.05	6.74	6.37	5.88	5.35	4.81	4.37	3.90	3.36	2.48	1.62	0.87	0.53	0.44	0.59	0.67
150	6.22	6.13	5.97	5.73	5.44	5.10	4.72	4.31	3.89	3.54	3.16	2.72	1.97	1.22	0.60	0.34	0.32	0.52	0.61
155	4.56	4.47	4.33	4.19	4.03	3.85	3.62	3.46	3.20	2.89	2.52	2.10	1.51	0.95	0.48	0.30	0.29	0.47	0.55
160	3.44	3.39	3.32	3.22	3.11	2.97	2.84	2.66	2.39	1.84	1.26	0.73	0.52	0.42	0.39	0.36	0.37	0.42	0.51
165	2.39	2.36	2.32	2.28	2.20	2.06	1.76	1.42	1.06	0.76	0.50	0.31	0.28	0.30	0.35	0.36	0.37	0.38	0.45
170	0.75	0.54	0.33	0.27	0.24	0.24	0.24	0.25	0.27	0.28	0.29	0.30	0.31	0.33	0.34	0.35	0.35	0.36	0.41
175	0.27	0.28	0.28	0.28	0.29	0.30	0.31	0.31	0.32	0.33	0.34	0.35	0.36	0.36	0.37	0.37	0.38	0.38	0.41
180	0.35	0.34	0.34	0.34	0.34	0.35	0.36	0.37	0.37	0.38	0.39	0.39	0.40	0.40	0.41	0.41	0.41	0.41	0.41
185	0.35	0.34	0.34	0.34	0.34	0.35	0.36	0.37	0.37	0.38	0.39	0.39	0.40	0.40	0.41	0.41	0.41	0.41	0.41

Table--3

UNIT: ×10cd

C (DEG) γ (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	65.4	66.4	66.8	66.8	66.8	66.9	67.0	67.0	66.9	66.8	66.7	66.7	66.8	66.8	66.6	66.3	66.0	66.3	66.6
5	55.1	51.8	48.7	45.6	42.7	39.8	37.0	34.5	32.2	30.2	28.7	28.1	27.9	27.9	28.0	28.1	28.2	28.1	28.0
10	47.7	41.6	35.2	30.4	28.2	30.8	36.8	46.0	60.4	76.3	91.8	103	112	119	124	128	131	128	124
15	35.2	31.1	33.1	41.6	56.8	86.0	117	144	154	157	154	148	139	129	118	109	104	109	118
20	26.0	29.5	58.7	94.0	127	136	135	127	108	87.0	69.0	69.0	73.5	79.5	78.9	77.5	75.9	77.5	78.9
25	35.0	41.2	73.5	109	137	125	102	77.4	67.1	59.9	54.8	49.3	44.9	41.7	40.4	40.0	40.2	40.0	40.4
30	64.8	69.3	77.5	84.3	87.7	79.0	67.3	55.0	48.4	43.7	41.0	40.8	41.8	43.1	42.8	42.4	42.0	42.4	42.8
35	92.8	100	98.7	91.4	80.4	66.6	52.9	41.4	39.7	40.5	42.0	39.4	36.2	32.9	30.5	28.6	27.6	28.6	30.5
40	97.0	103	91.5	74.3	55.9	49.6	45.7	42.6	36.5	30.5	24.8	20.9	17.8	15.5	14.1	13.3	13.1	13.3	14.1
45	81.3	84.7	75.2	61.0	45.8	38.9	33.8	29.4	23.4	17.8	12.9	10.0	8.06	6.83	5.95	5.51	5.44	5.51	5.95
50	63.9	65.7	59.8	50.4	39.5	31.0	23.3	16.5	11.9	8.35	5.87	4.23	3.25	2.74	2.39	2.26	2.30	2.26	2.39
55	52.2	52.4	46.5	37.9	28.3	21.0	14.5	9.23	6.18	4.24	3.10	2.16	1.60	1.33	1.16	1.12	1.17	1.12	1.16
60	41.7	40.4	34.0	25.9	17.6	12.5	8.57	5.61	3.73	2.55	1.87	1.25	0.85	0.63	0.52	0.50	0.53	0.50	0.52
65	31.7	29.5	23.6	16.6	9.96	6.74	4.65	3.37	2.34	1.68	1.27	0.83	0.50	0.28	0.19	0.18	0.21	0.18	0.19
70	22.2	19.6	15.2	10.4	6.15	4.24	3.15	2.56	1.89	1.39	1.01	0.64	0.35	0.15	0.10	0.11	0.15	0.11	0.10
75	14.6	12.4	9.43	6.56	4.08	3.01	2.45	2.17	1.71	1.32	0.99	0.68	0.43	0.24	0.20	0.21	0.25	0.21	0.20
80	7.75	6.48	5.25	4.15	3.23	2.68	2.29	1.98	1.61	1.26	0.96	0.70	0.49	0.35	0.31	0.32	0.35	0.32	0.31
85	4.81	4.41	3.82	3.19	2.60	2.25	1.97	1.73	1.44	1.16	0.91	0.71	0.55	0.44	0.41	0.42	0.45	0.42	0.41
90	2.79	2.72	2.49	2.21	1.91	1.73	1.57	1.42	1.21	1.01	0.82	0.69	0.59	0.53	0.51	0.52	0.54	0.52	0.51
95	2.10	2.03	1.84	1.62	1.39	1.27	1.18	1.09	0.95	0.81	0.70	0.64	0.60	0.58	0.58	0.59	0.60	0.59	0.58
100	1.84	1.70	1.52	1.35	1.19	1.09	1.01	0.95	0.85	0.76	0.68	0.65	0.63	0.63	0.63	0.64	0.64	0.64	0.63
105	1.59	1.48	1.35	1.21	1.09	1.01	0.96	0.90	0.83	0.75	0.69	0.67	0.66	0.66	0.66	0.67	0.67	0.67	0.66
110	1.40	1.32	1.21	1.11	1.01	0.95	0.91	0.87	0.80	0.74	0.68	0.66	0.65	0.66	0.66	0.66	0.67	0.66	0.66
115	1.24	1.19	1.10	1.02	0.93	0.89	0.86	0.83	0.77	0.72	0.67	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
120	1.15	1.14	1.07	0.99	0.90	0.86	0.84	0.81	0.76	0.71	0.67	0.65	0.65	0.65	0.64	0.64	0.65	0.64	0.64
125	1.10	1.13	1.06	0.96	0.86	0.84	0.82	0.81	0.77	0.73	0.69	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
130	0.99	1.02	0.98	0.91	0.85	0.82	0.81	0.79	0.76	0.74	0.72	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.72
135	0.88	0.91	0.89	0.86	0.82	0.79	0.78	0.76	0.74	0.73	0.72	0.72	0.73	0.74	0.75	0.75	0.75	0.75	0.75
140	0.83	0.86	0.84	0.81	0.76	0.74	0.73	0.71	0.70	0.70	0.70	0.71	0.73	0.74	0.75	0.75	0.75	0.75	0.75
145	0.73	0.76	0.76	0.74	0.71	0.69	0.68	0.66	0.66	0.67	0.68	0.69	0.70	0.72	0.73	0.73	0.73	0.73	0.73
150	0.67	0.71	0.70	0.68	0.66	0.64	0.63	0.62	0.63	0.64	0.65	0.66	0.67	0.67	0.68	0.69	0.69	0.69	0.68
155	0.61	0.65	0.65	0.63	0.61	0.60	0.59	0.59	0.59	0.60	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
160	0.57	0.60	0.60	0.59	0.57	0.57	0.58	0.58	0.58	0.58	0.58	0.57	0.57	0.56	0.55	0.54	0.52	0.54	0.55
165	0.50	0.54	0.54	0.54	0.53	0.54	0.54	0.55	0.54	0.53	0.52	0.50	0.48	0.47	0.45	0.44	0.43	0.44	0.45
170	0.45	0.48	0.48	0.48	0.47	0.47	0.47	0.46	0.44	0.42	0.39	0.37	0.34	0.32	0.31	0.31	0.31	0.31	0.31
175	0.44	0.45	0.46	0.45	0.44	0.44	0.43	0.42	0.40	0.38	0.36	0.34	0.33	0.32	0.32	0.32	0.32	0.32	0.32
180	0.40	0.40	0.39	0.40	0.40	0.40	0.40	0.40	0.40	0.39	0.38	0.37	0.36	0.35	0.34	0.34	0.34	0.34	0.34

C (DEG) γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	66.8	66.8	66.7	66.7	66.8	66.9	67.0	67.0	66.9	66.8	66.8	66.8	66.4	65.4	64.0				
5	27.9	27.9	28.1	28.7	30.2	32.2	34.5	37.0	39.8	42.7	45.6	48.7	51.8	55.1	58.6				
10	119	112	103	91.8	76.3	60.4	46.0	36.8	30.8	28.2	30.4	35.2	41.6	47.7	54.5				
15	129	139	148	154	157	154	144	117	86.0	56.8	41.6	33.1	31.1	35.2	45.7				
20	79.5	73.5	69.0	69.0	87.0	108	127	135	136	127	94.0	58.7	29.5	26.0	37.0				
25	41.7	44.9	49.3	54.8	59.9	67.1	77.4	102	125	137	109	73.5	41.2	35.0	41.7				
30	43.1	41.8	40.8	41.0	43.7	48.4	55.0	67.3	79.0	87.7	84.3	77.5	69.3	64.8	61.1				
35	32.9	36.2	39.4	42.0	40.5	39.7	41.4	52.9	66.6	80.4	91.4	98.7	100	92.8	77.9				
40	15.5	17.8	20.9	24.8	30.5	36.5	42.6	45.7	49.6	55.9	74.3	91.5	103	97.0	80.5				
45	6.83	8.06	10.0	12.9	17.8	23.4	29.4	33.8	38.9	45.8	61.0	75.2	84.7	81.3	69.6				
50	2.74	3.25	4.23	5.87	8.35	11.9	16.5	23.3	31.0	39.5	50.4	59.8	65.7	63.9	56.8				
55	1.33	1.60	2.16	3.10	4.24	6.18	9.23	14.5	21.0	28.3	37.9	46.5	52.4	52.2	47.7				
60	0.63	0.85	1.25	1.87	2.55	3.73	5.61	8.57	12.5	17.6	25.9	34.0	40.4	41.7	40.0				
65	0.28	0.50	0.83	1.27	1.68	2.34	3.37	4.65	6.74	9.96	16.6	23.6	29.5	31.7	31.8				
70	0.15	0.35	0.64	1.01	1.39	1.89	2.56	3.15	4.24	6.15	10.4	15.2	19.6	22.2	23.9				
75	0.24	0.43	0.68	0.99	1.32	1.71	2.17	2.45	3.01	4.08	6.56	9.43	12.4	14.6	16.6				
80	0.35	0.49	0.70	0.96	1.26	1.61	1.98	2.29	2.68	3.23	4.15	5.25	6.48	7.75	9.11				
85	0.44	0.55	0.71	0.91	1.16	1.44	1.73	1.97	2.25	2.60	3.19	3.82	4.41	4.81	5.09				
90	0.53	0.59	0.69	0.82	1.01	1.21	1.42	1.57	1.73	1.91	2.21	2.49	2.72	2.79	2.75				
95	0.58	0.60	0.64	0.70	0.81	0.95	1.09	1.18	1.27	1.39	1.62	1.84	2.03	2.10	2.10				
100	0.63	0.63	0.65	0.68	0.76	0.85	0.95	1.01	1.09	1.19	1.35	1.52	1.70	1.84	1.97				
105	0.66	0.66	0.67	0.69	0.75	0.83	0.90	0.96	1.01	1.09	1.21	1.35	1.48	1.59	1.67				
110	0.66	0.65	0.66	0.68	0.74	0.80	0.87	0.91	0.95	1.01	1.11	1.21	1.32	1.40	1.47				
115	0.65	0.65	0.65	0.67	0.72	0.77	0.83	0.86	0.89	0.93	1.02	1.10	1.19	1.24	1.27				
120	0.65	0.65	0.65	0.67	0.71	0.76	0.81	0.84	0.86	0.90	0.99	1.07	1.14	1.15	1.12				
125	0.68	0.68	0.68	0.69	0.73	0.77	0.81	0.82	0.84	0.86	0.96	1.06	1.13	1.10	1.03				
130	0.72	0.72	0.71	0.72	0.74	0.76	0.79	0.81	0.82	0.85	0.91	0.98	1.02	0.99	0.92				
135	0.74	0.73	0.72	0.72	0.73	0.74	0.76	0.78	0.79	0.82	0.86	0.89	0.91	0.88	0.82				
140	0.74	0.73	0.71	0.70	0.70	0.70	0.71	0.73	0.74	0.76	0.81	0.84	0.86	0.83	0.76				
145	0.72	0.70	0.69	0.68	0.67	0.66	0.66	0.68	0.69	0.71	0.74	0.76	0.76	0.73	0.67				
150	0.67	0.67	0.66	0.65	0.64	0.63	0.62	0.63	0.64	0.66	0.68	0.70	0.71	0.67	0.61				
155	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.60	0.61	0.63	0.65	0.65	0.61	0.55				
160	0.56	0.57	0.57	0.58	0.58	0.58	0.59	0.58	0.57	0.57	0.59	0.60	0.60	0.57	0.51				
165	0.47	0.48	0.50	0.52	0.53	0.54	0.55	0.54	0.54	0.53	0.54	0.54	0.54	0.50	0.45				
170	0.32	0.34	0.37	0.39	0.42	0.44	0.46	0.47	0.47	0.47	0.48	0.48	0.48	0.48	0.45	0.41			
175	0.32	0.33	0.34	0.36	0.38	0.40	0.42	0.43	0.44	0.44	0.45	0.46	0.45	0.44	0.41				
180	0.35	0.36	0.37	0.38	0.39	0.40	0.40	0.40	0.40	0.40	0.40	0.39	0.40	0.40	0.40				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34L @ 100W / 4000K	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	0.850	101.5	0.995	3.73
277.0	60	0.399	98.7	0.894	12.39

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*****