

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

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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		21123
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		146.8
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		20348
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	141.4
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		143.9
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	3.52
			277V	8.57
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.997
			277V	0.936
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5067
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		74.8
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-26
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		75
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		94
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-17%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		7.6%
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		1.203
(Goniophotometer – Section 4.2)		Non-Worst Case		0.541
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		143.9
(Goniophotometer – Section 4.2)		Non-Worst Case		140.1

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-12	W34L @ 150W / 5000K	230612001-S1
2	Goniophotometer Test	2023-06-12	W34L @ 150W / 5000K	230612001-S1
3	THD and PF Test	2023-06-12	W34L @ 150W / 5000K	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 / 5000K, color tunable from 3000K, 4000K and 5000K.

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

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	W34L @ 150W / 5000K	Sample ID	230612001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

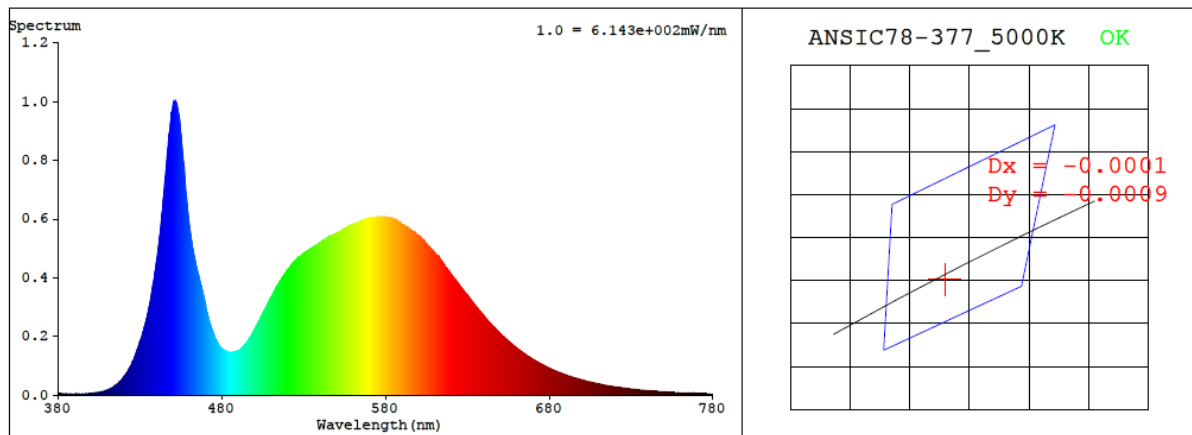
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	1.203	143.9	0.997
277.0	60	0.541	140.1	0.936

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5067	74.8	-26	-0.0004	75	94	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3431$ $y = 0.3493$ / $u' = 0.2110$ $v' = 0.4832$ ($duv = -4.02e-04$)

CCT= 5067K Prcp WL: Ld=572.3nm Purity=7.7%

Peak WL: Lp=451nm FWHM: =21.1nm Ratio:R=14.6% G=81.7% B=3.7%

Render Index: Ra = 74.8 AvgR = 65.2 TM30:Rf=75 Rg=93

EEI: 0.09212 A++ Highest

R1 =72 R2 =81 R3 =86 R4 =74 R5 =73 R6 =73 R7 =82

R8 =57 R9 =-26 R10=54 R11=70 R12=48 R13=74 R14=92 R15=67

4.1 Integrating Sphere Test

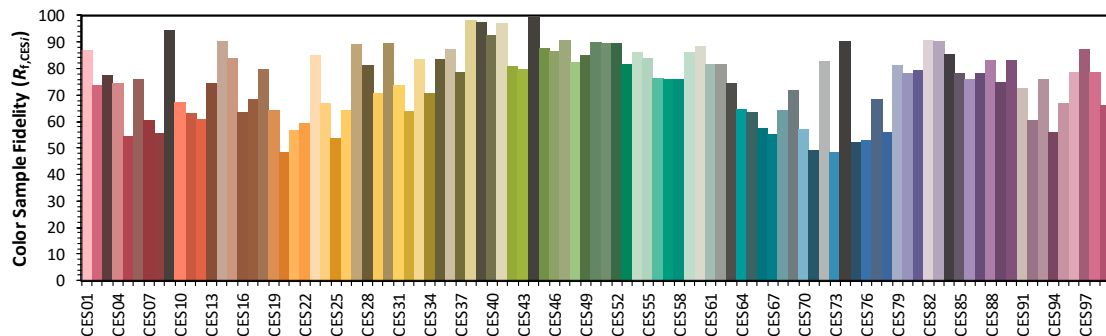
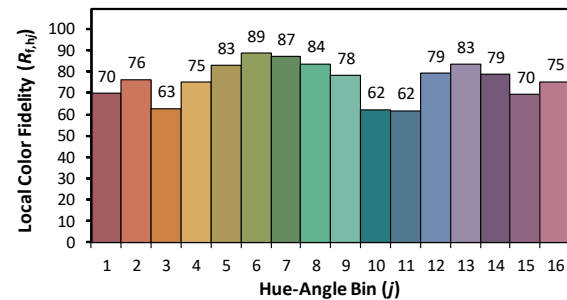
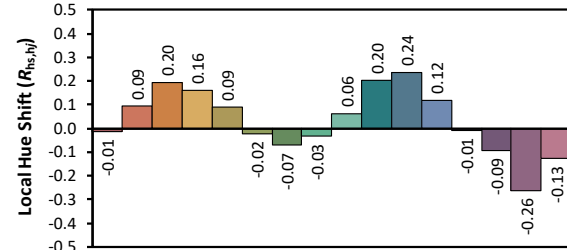
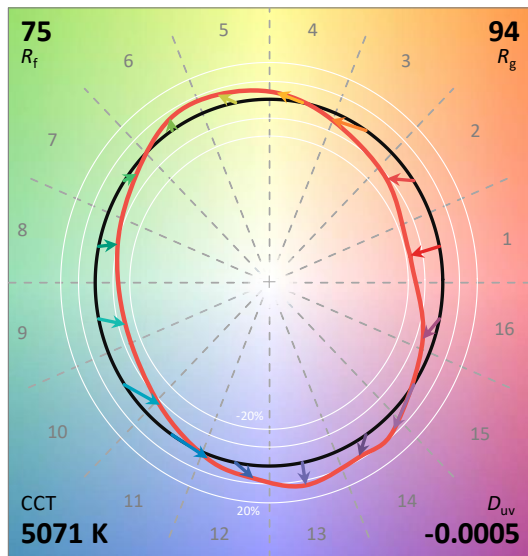
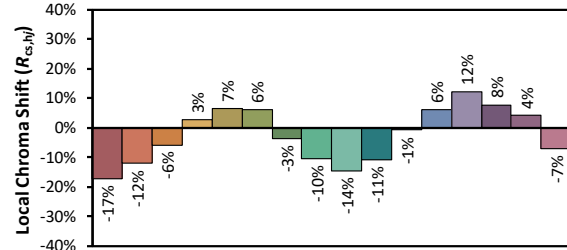
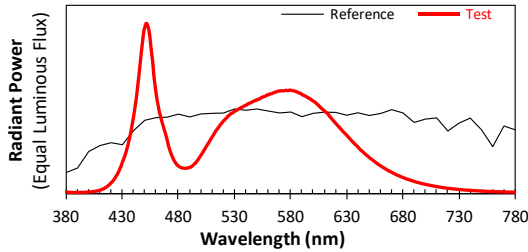
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/13

Model: W34L @ 150W / 5000K



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

x 0.3431

y 0.3491

u' 0.2110

v' 0.4831

CIE 13.3-1995
(CRI)

R_a 75

R_g -26

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	6.00E-06	447	8.37E-04	514	3.72E-04	581	6.05E-04	648	2.21E-04	715	3.26E-05
381	5.70E-06	448	8.93E-04	515	3.82E-04	582	6.04E-04	649	2.16E-04	716	3.17E-05
382	4.80E-06	449	9.50E-04	516	3.89E-04	583	6.02E-04	650	2.10E-04	717	3.09E-05
383	4.30E-06	450	9.78E-04	517	4.00E-04	584	5.99E-04	651	2.04E-04	718	3.00E-05
384	3.70E-06	451	1.00E-03	518	4.08E-04	585	5.98E-04	652	1.99E-04	719	2.91E-05
385	4.10E-06	452	9.98E-04	519	4.16E-04	586	5.96E-04	653	1.94E-04	720	2.83E-05
386	3.50E-06	453	9.76E-04	520	4.25E-04	587	5.92E-04	654	1.89E-04	721	2.71E-05
387	2.70E-06	454	9.48E-04	521	4.31E-04	588	5.89E-04	655	1.84E-04	722	2.67E-05
388	3.60E-06	455	8.90E-04	522	4.38E-04	589	5.88E-04	656	1.79E-04	723	2.60E-05
389	3.80E-06	456	8.27E-04	523	4.44E-04	590	5.81E-04	657	1.75E-04	724	2.51E-05
390	3.90E-06	457	7.75E-04	524	4.53E-04	591	5.78E-04	658	1.70E-04	725	2.44E-05
391	3.50E-06	458	6.96E-04	525	4.58E-04	592	5.74E-04	659	1.65E-04	726	2.37E-05
392	4.20E-06	459	6.40E-04	526	4.64E-04	593	5.72E-04	660	1.61E-04	727	2.31E-05
393	4.10E-06	460	5.90E-04	527	4.70E-04	594	5.68E-04	661	1.57E-04	728	2.22E-05
394	3.80E-06	461	5.47E-04	528	4.72E-04	595	5.64E-04	662	1.52E-04	729	2.16E-05
395	3.90E-06	462	5.12E-04	529	4.77E-04	596	5.60E-04	663	1.48E-04	730	2.09E-05
396	4.40E-06	463	4.78E-04	530	4.82E-04	597	5.56E-04	664	1.44E-04	731	2.03E-05
397	4.50E-06	464	4.53E-04	531	4.85E-04	598	5.53E-04	665	1.40E-04	732	1.96E-05
398	5.30E-06	465	4.26E-04	532	4.89E-04	599	5.47E-04	666	1.36E-04	733	1.91E-05
399	5.50E-06	466	4.04E-04	533	4.93E-04	600	5.43E-04	667	1.32E-04	734	1.85E-05
400	5.05E-06	467	3.81E-04	534	4.98E-04	601	5.39E-04	668	1.29E-04	735	1.79E-05
401	6.40E-06	468	3.59E-04	535	5.01E-04	602	5.34E-04	669	1.25E-04	736	1.75E-05
402	7.10E-06	469	3.35E-04	536	5.05E-04	603	5.28E-04	670	1.22E-04	737	1.72E-05
403	7.60E-06	470	3.12E-04	537	5.08E-04	604	5.22E-04	671	1.19E-04	738	1.64E-05
404	8.70E-06	471	2.81E-04	538	5.11E-04	605	5.16E-04	672	1.15E-04	739	1.62E-05
405	8.90E-06	472	2.59E-04	539	5.15E-04	606	5.09E-04	673	1.12E-04	740	1.56E-05
406	1.06E-05	473	2.40E-04	540	5.19E-04	607	5.03E-04	674	1.08E-04	741	1.49E-05
407	1.16E-05	474	2.22E-04	541	5.21E-04	608	4.96E-04	675	1.06E-04	742	1.46E-05
408	1.29E-05	475	2.07E-04	542	5.27E-04	609	4.91E-04	676	1.03E-04	743	1.42E-05
409	1.52E-05	476	1.92E-04	543	5.29E-04	610	4.84E-04	677	1.00E-04	744	1.39E-05
410	1.69E-05	477	1.82E-04	544	5.32E-04	611	4.78E-04	678	9.65E-05	745	1.33E-05
411	1.93E-05	478	1.72E-04	545	5.36E-04	612	4.73E-04	679	9.44E-05	746	1.31E-05
412	2.19E-05	479	1.65E-04	546	5.38E-04	613	4.68E-04	680	9.16E-05	747	1.26E-05
413	2.45E-05	480	1.59E-04	547	5.42E-04	614	4.58E-04	681	8.90E-05	748	1.23E-05
414	2.80E-05	481	1.55E-04	548	5.45E-04	615	4.50E-04	682	8.65E-05	749	1.21E-05
415	3.25E-05	482	1.51E-04	549	5.46E-04	616	4.43E-04	683	8.39E-05	750	1.16E-05
416	3.66E-05	483	1.49E-04	550	5.52E-04	617	4.34E-04	684	8.16E-05	751	1.12E-05
417	4.18E-05	484	1.47E-04	551	5.52E-04	618	4.27E-04	685	7.97E-05	752	1.07E-05
418	4.70E-05	485	1.46E-04	552	5.55E-04	619	4.19E-04	686	7.70E-05	753	1.07E-05
419	5.30E-05	486	1.46E-04	553	5.58E-04	620	4.12E-04	687	7.48E-05	754	1.02E-05
420	6.04E-05	487	1.46E-04	554	5.64E-04	621	4.04E-04	688	7.28E-05	755	1.02E-05
421	6.70E-05	488	1.47E-04	555	5.66E-04	622	3.97E-04	689	7.07E-05	756	9.70E-06
422	7.47E-05	489	1.49E-04	556	5.69E-04	623	3.90E-04	690	6.87E-05	757	9.10E-06
423	8.47E-05	490	1.51E-04	557	5.70E-04	624	3.82E-04	691	6.67E-05	758	9.10E-06
424	9.51E-05	491	1.54E-04	558	5.74E-04	625	3.76E-04	692	6.46E-05	759	8.90E-06
425	1.06E-04	492	1.58E-04	559	5.79E-04	626	3.67E-04	693	6.30E-05	760	8.60E-06
426	1.17E-04	493	1.64E-04	560	5.78E-04	627	3.60E-04	694	6.12E-05	761	8.50E-06
427	1.31E-04	494	1.71E-04	561	5.83E-04	628	3.54E-04	695	5.91E-05	762	8.10E-06
428	1.47E-04	495	1.76E-04	562	5.85E-04	629	3.47E-04	696	5.75E-05	763	8.00E-06
429	1.61E-04	496	1.85E-04	563	5.86E-04	630	3.40E-04	697	5.60E-05	764	7.60E-06
430	1.82E-04	497	1.93E-04	564	5.89E-04	631	3.33E-04	698	5.41E-05	765	7.50E-06
431	1.98E-04	498	2.02E-04	565	5.92E-04	632	3.25E-04	699	5.28E-05	766	7.40E-06
432	2.17E-04	499	2.13E-04	566	5.95E-04	633	3.18E-04	700	5.11E-05	767	7.00E-06
433	2.36E-04	500	2.22E-04	567	5.96E-04	634	3.10E-04	701	4.98E-05	768	7.20E-06
434	2.59E-04	501	2.33E-04	568	5.99E-04	635	3.03E-04	702	4.84E-05	769	6.60E-06
435	2.84E-04	502	2.45E-04	569	6.01E-04	636	2.97E-04	703	4.71E-05	770	6.30E-06
436	3.12E-04	503	2.55E-04	570	6.02E-04	637	2.90E-04	704	4.54E-05	771	6.30E-06
437	3.43E-04	504	2.65E-04	571	6.02E-04	638	2.84E-04	705	4.43E-05	772	6.10E-06
438	3.76E-04	505	2.77E-04	572	6.03E-04	639	2.78E-04	706	4.27E-05	773	5.80E-06
439	4.14E-04	506	2.88E-04	573	6.03E-04	640	2.71E-04	707	4.18E-05	774	5.70E-06
440	4.52E-04	507	2.98E-04	574	6.03E-04	641	2.63E-04	708	4.03E-05	775	5.60E-06
441	4.95E-04	508	3.09E-04	575	6.04E-04	642	2.56E-04	709	3.93E-05	776	5.50E-06
442	5.39E-04	509	3.20E-04	576	6.06E-04	643	2.50E-04	710	3.82E-05	777	5.40E-06
443	5.92E-04	510	3.31E-04	577	6.04E-04	644	2.44E-04	711	3.68E-05	778	5.00E-06
444	6.50E-04	511	3.41E-04	578	6.05E-04	645	2.39E-04	712	3.59E-05	779	5.10E-06
445	7.10E-04	512	3.53E-04	579	6.07E-04	646	2.32E-04	713	3.46E-05	780	5.10E-06
446	7.73E-04	513	3.64E-04	580	6.06E-04	647	2.27E-04	714	3.37E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34L @ 150W / 5000K	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	1.203	143.9	0.997
NON-WORST CASE	277.0	60	0.541	140.1	0.936

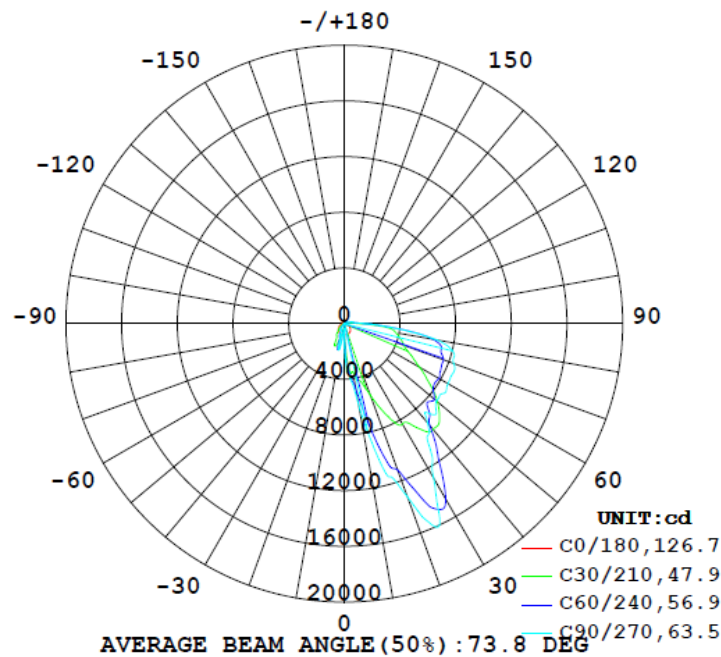
Test Result

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	21123	104.0	134.4	63.1	83.8	146.8	7.3%	B1-U3-G5
0°-90° zones	20348	104.0	134.4	63.1	83.8	141.4	7.6%	B1-U3-G5

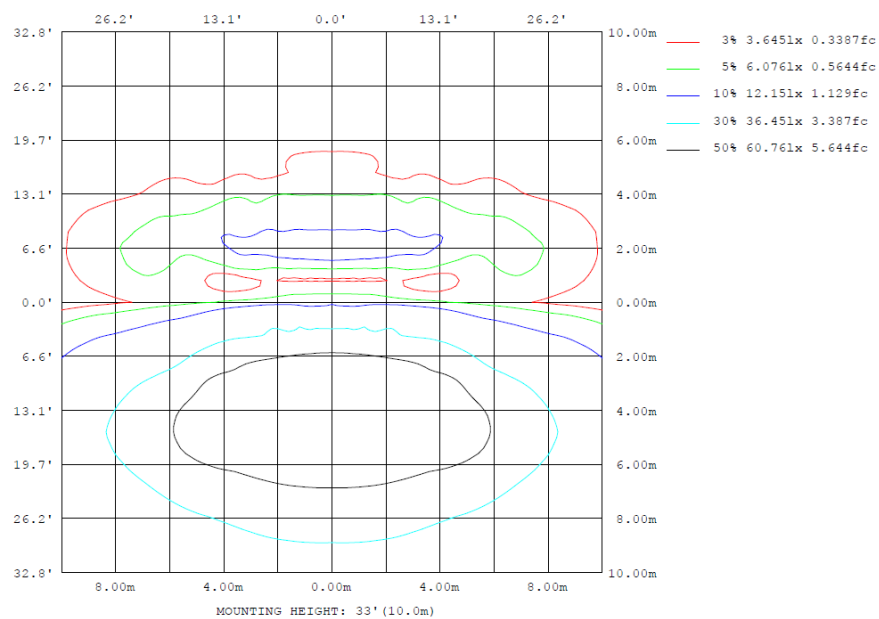
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

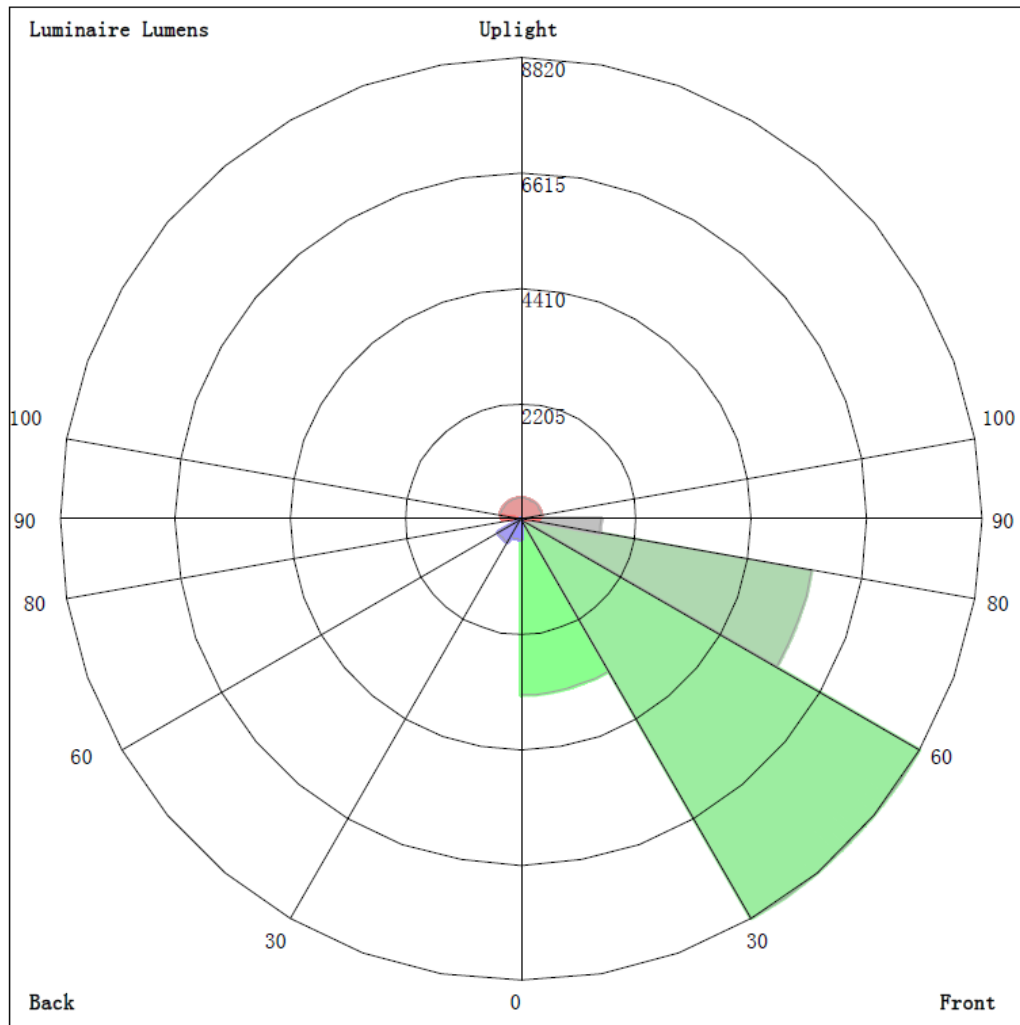
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	φ zone	φ total	%lum, lamp
10	78.85	419.7	583.1	419.7	78.85	59.71	164.0	59.71	0- 10	181.0	181.0	0.86,0.86
20	79.42	932.0	1323	932.0	79.42	157.6	94.16	157.6	10- 20	1085	1266	5.99,5.99
30	74.20	1346	1285	1346	74.20	70.05	52.64	70.05	20- 30	2473	3739	17.7,17.7
40	67.41	1149	930.1	1149	67.41	52.75	16.32	52.75	30- 40	3102	6841	32.4,32.4
50	56.52	784.1	862.3	784.1	56.52	20.90	2.820	20.90	40- 50	3131	9972	47.2,47.2
60	44.96	693.6	860.3	693.6	44.96	6.898	0.6711	6.898	50- 60	3087	13060	61.8,61.8
70	31.30	649.8	836.2	649.8	31.30	3.292	0.1945	3.292	60- 70	2991	16050	76,76
80	13.57	576.7	672.1	576.7	13.57	2.559	0.4465	2.559	70- 80	2756	18806	89,89
90	3.336	139.6	153.1	139.6	3.336	1.813	0.6804	1.813	80- 90	1542	20348	96.3,96.3
100	2.637	49.26	67.52	49.26	2.637	1.205	0.8136	1.205	90-100	372.4	20720	98.1,98.1
110	1.956	22.09	31.45	22.09	1.956	1.101	0.8414	1.101	100-110	171.5	20892	98.9,98.9
120	1.342	17.74	21.23	17.74	1.342	1.034	0.8161	1.034	110-120	91.16	20983	99.3,99.3
130	1.035	11.31	20.44	11.31	1.035	1.006	0.9102	1.006	120-130	63.43	21047	99.6,99.6
140	0.8467	7.345	12.33	7.345	0.8467	0.9024	0.9456	0.9024	130-140	42.02	21089	99.8,99.8
150	0.6657	4.886	7.863	4.886	0.6657	0.7855	0.8667	0.7855	140-150	20.80	21109	99.9,99.9
160	0.5313	2.984	4.350	2.984	0.5313	0.7412	0.6608	0.7412	150-160	9.950	21119	100,100
170	0.4541	0.3346	1.135	0.3346	0.4541	0.5828	0.3861	0.5828	160-170	3.178	21123	100,100
180	0.5171	0.4697	0.4436	0.4697	0.5171	0.5062	0.4232	0.5062	170-180	0.4256	21123	100,100
DEG	LUMINOUS INTENSITY:×10cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	181.01	0-10	181.01	0.86%
10-20	1085.00	0-20	1266.01	5.99%
20-30	2473.35	0-30	3739.36	17.70%
30-40	3101.69	0-40	6841.05	32.39%
40-50	3131.35	0-50	9972.40	47.21%
50-60	3087.26	0-60	13059.66	61.83%
60-70	2990.68	0-70	16050.34	75.99%
70-80	2755.60	0-80	18805.94	89.03%
80-90	1542.22	0-90	20348.16	96.33%
90-100	372.37	0-100	20720.53	98.10%
100-110	171.49	0-110	20892.02	98.91%
110-120	91.16	0-120	20983.18	99.34%
120-130	63.43	0-130	21046.61	99.64%
130-140	42.02	0-140	21088.63	99.84%
140-150	20.80	0-150	21109.43	99.94%
150-160	9.95	0-160	21119.38	99.98%
160-170	3.18	0-170	21122.56	100.00%
170-180	0.43	0-180	21122.99	100.00%

4.2 Goniophotometer Test

LCS/BUG

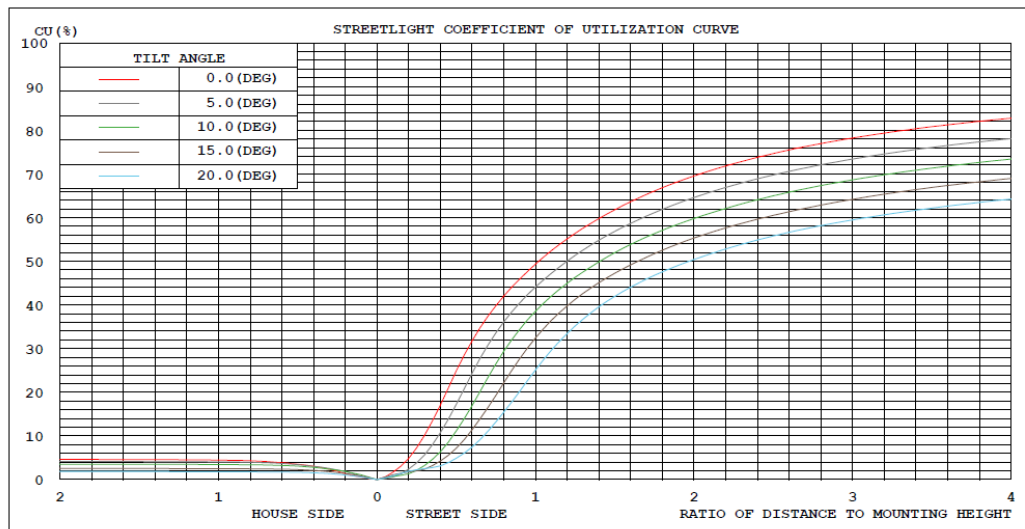


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

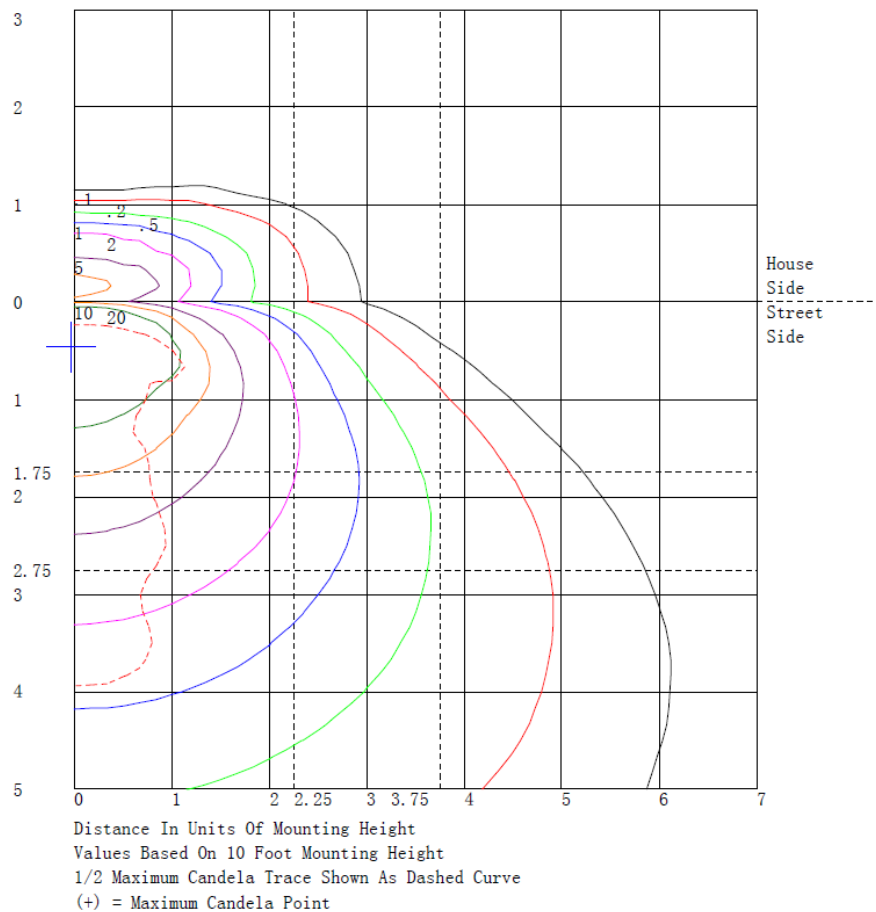
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	3356.7	N.A.	15.9
FM - Front-Medium (30-60)	8819.6	N.A.	41.8
FH - Front-High (60-80)	5650.3	N.A.	26.7
FVH - Front-Very High (80-90)	1526.7	N.A.	7.2
BL - Back-Low (0-30)	382.7	N.A.	1.8
BM - Back-Medium (30-60)	500.7	N.A.	2.4
BH - Back-High (60-80)	95.9	N.A.	0.5
BVH - Back-Very High (80-90)	15.5	N.A.	0.1
UL - Uplight-Low (90-100)	372.4	N.A.	1.8
UH - Uplight-High (100-180)	402.5	N.A.	1.9
Total	21123.0	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) y (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	79.3	79.4	79.5	79.7	79.9	80.0	80.2	80.5	80.7	81.0	81.2	81.4	81.6	81.9	82.2	82.5	82.7	82.9	83.1
5	79.0	92.6	115	146	193	243	290	319	339	352	354	352	348	346	344	343	343	343	344
10	78.9	172	246	301	328	342	352	374	397	420	437	455	474	502	530	556	571	580	583
15	79.4	195	288	357	386	404	423	475	539	612	694	778	858	922	975	1018	1048	1067	1074
20	79.4	188	284	367	424	479	546	672	806	932	1007	1066	1117	1178	1233	1279	1305	1319	1323
25	77.3	175	278	384	497	613	731	847	965	1084	1216	1341	1449	1513	1556	1582	1600	1607	1607
30	74.2	162	266	385	523	673	834	1020	1197	1346	1419	1454	1457	1425	1380	1331	1306	1290	1285
35	71.6	169	284	416	577	745	914	1087	1233	1333	1313	1253	1178	1145	1119	1099	1077	1061	1053
40	67.4	182	312	458	645	829	991	1084	1136	1149	1096	1025	955	945	947	956	947	937	930
45	63.5	182	314	458	648	826	967	987	963	918	889	864	846	854	871	891	906	918	925
50	56.5	156	271	400	577	744	873	871	832	784	797	820	844	850	852	852	857	860	862
55	49.5	159	270	385	521	646	745	765	759	744	753	766	782	800	819	837	854	866	873
60	45.0	143	241	337	443	541	622	658	679	694	725	756	785	807	824	837	849	857	860
65	37.6	120	201	283	368	450	525	584	634	677	712	742	767	791	812	830	843	853	857
70	31.3	79.8	137	203	286	371	456	528	593	650	693	729	757	782	801	816	827	834	836
75	23.5	49.4	91.3	149	233	326	418	494	560	617	659	693	721	750	775	795	807	813	815
80	13.6	30.8	65.3	117	197	285	376	453	521	577	611	634	648	659	666	670	672	673	672
85	6.75	18.7	45.4	87.0	157	232	301	334	354	363	368	368	365	364	362	360	359	358	357
90	3.34	13.0	26.6	44.1	69.9	96.3	120	130	136	140	145	149	153	154	154	154	154	154	153
95	2.57	7.30	13.6	21.5	32.7	44.1	54.7	60.2	64.4	68.0	73.7	79.2	83.9	86.2	87.4	88.0	88.5	88.6	88.5
100	2.64	5.94	9.89	14.5	20.0	25.9	32.1	38.0	43.8	49.3	54.4	58.9	62.5	64.6	65.9	66.6	67.2	67.5	67.5
105	2.21	4.55	7.26	10.3	14.1	18.0	21.8	24.2	26.6	29.2	33.7	38.4	42.9	46.5	49.4	51.6	52.7	53.2	53.1
110	1.96	3.72	5.79	8.17	11.2	14.3	17.2	19.0	20.5	22.1	24.5	26.9	29.0	30.2	30.9	31.3	31.5	31.5	31.4
115	1.63	2.90	4.52	6.49	9.16	11.9	14.5	16.0	17.3	18.4	19.7	20.9	22.2	23.7	25.1	26.2	26.5	26.6	26.5
120	1.34	2.35	3.64	5.20	7.16	9.30	11.5	13.9	16.0	17.7	18.3	18.6	18.7	19.6	20.4	21.1	21.3	21.3	21.2
125	1.15	1.94	2.95	4.20	5.73	7.45	9.33	11.5	13.6	15.5	17.1	18.3	19.1	19.5	19.5	19.4	19.3	19.1	19.0
130	1.03	1.69	2.53	3.54	4.82	6.21	7.63	8.70	9.88	11.3	13.8	16.3	18.6	19.9	20.7	21.2	21.1	20.8	20.4
135	0.95	1.50	2.18	3.01	4.07	5.20	6.32	7.15	7.97	8.85	9.97	11.2	12.7	14.5	16.2	17.8	18.8	19.3	19.5
140	0.85	1.23	1.75	2.39	3.25	4.17	5.10	5.87	6.61	7.35	8.15	8.95	9.71	10.4	11.1	11.6	12.0	12.2	12.3
145	0.75	0.55	0.66	1.08	2.02	3.11	4.21	4.89	5.49	6.04	6.72	7.38	7.99	8.48	8.88	9.20	9.43	9.57	9.62
150	0.67	0.41	0.44	0.75	1.54	2.46	3.40	3.97	4.45	4.89	5.41	5.92	6.40	6.82	7.18	7.48	7.68	7.81	7.86
155	0.59	0.38	0.38	0.61	1.18	1.89	2.62	3.15	3.61	4.01	4.33	4.60	4.83	5.06	5.26	5.44	5.60	5.73	5.79
160	0.53	0.49	0.48	0.50	0.45	0.50	0.71	1.42	2.22	2.98	3.34	3.56	3.71	3.89	4.04	4.16	4.25	4.32	4.35
165	0.48	0.47	0.46	0.45	0.41	0.39	0.39	0.39	0.47	0.68	1.28	1.95	2.56	2.77	2.87	2.89	2.95	2.99	3.01
170	0.45	0.45	0.44	0.42	0.41	0.39	0.38	0.36	0.35	0.33	0.32	0.31	0.31	0.31	0.35	0.43	0.69	0.94	1.14
175	0.48	0.47	0.47	0.46	0.45	0.45	0.44	0.43	0.42	0.41	0.39	0.38	0.37	0.36	0.36	0.35	0.35	0.34	0.35
180	0.52	0.52	0.51	0.51	0.51	0.50	0.49	0.49	0.48	0.47	0.46	0.45	0.44	0.43	0.43	0.42	0.43	0.43	0.44

C (DEG) y (DEG)		95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	82.9	82.7	82.5	82.2	81.9	81.6	81.4	81.2	81.0	80.7	80.5	80.2	80.0	79.9	79.7	79.5	79.4	79.3	79.3	81.6
5	343	343	343	344	346	348	352	354	352	339	319	290	243	193	146	115	92.6	79.0	74.4	61.6
10	580	571	556	530	502	474	455	437	420	397	374	352	342	328	301	246	172	78.9	69.0	57.0
15	1067	1048	1018	975	922	858	778	694	612	539	475	423	404	386	357	288	195	79.4	57.6	47.2
20	1319	1305	1279	1233	1178	1117	1066	1007	932	806	672	546	479	424	367	284	188	79.4	47.2	22.2
25	1607	1600	1582	1556	1513	1449	1341	1216	1084	965	847	731	613	497	384	278	175	77.3	53.4	4.4
30	1290	1306	1331	1380	1425	1457	1454	1419	1346	1197	1020	834	673	523	385	266	162	74.2	78.5	9.5
35	1061	1077	1099	1119	1145	1178	1253	1313	1333	1233	1087	914	745	577	416	284	169	71.6	99.3	3.3
40	937	947	956	947	945	955	1025	1096	1149	1136	1084	991	829	645	458	312	182	67.4	101	0.1
45	918	906	891	871	854	846	864	889	918	963	987	967	826	648	458	314	182	63.5	88.1	0.1
50	860	857	852	852	850	844	820	797	784	832	871	873	744	577	400	271	156	56.5	71.5	0.1
55	866	854	837	819	800	782	766	753	744	759	765	745	646	521	385	270	159	49.5	60.4	0.1
60	857	849	837	824	807	785	756	725	694	679	658	622	541	443	337	241	143	45.0	50.8	0.1
65	853	843	830	812	791	767	742	712	677	634	584	525	450	368	283	201	120	37.6	40.1	0.1
70	834	827	816	801	782	757	729	693	650	593	528	456	371	286	203	137	79.8	31.3	30.4	0.1
75	813	807	795	775	750	721	693	659	617	560	494	418	326	233	149	91.3	49.4	23.5	21.4	0.1
80	673	672	670	666	659	648	634	611	577	521	453	376	285	197	117	65.3	30.8	13.6	11.8	0.1
85	358	359	360	362	364	365	368	368	363	354	334	301	232	157	87.0	45.4	18.7	6.75	6.55	0.1
90	154	154	154	154	154	153	149	145	140	136	130	120	96.3	69.9	44.1	26.6	13.0	3.34	3.47	0.1
95	88.6	88.5	88.0	87.4	86.2	83.9	79.2	73.7	68.0	64.4	60.2	54.7	44.1	32.7	21.5	13.6	7.30	2.57	2.67	0.1
100	67.5	67.2	66.6	65.9	64.6	62.5	58.9	54.4	49.3	43.8	38.0	32.1	25.9	20.0	14.5	9.89	5.94	2.64	2.51	0.1
105	53.2	52.7	51.6	49.4	46.5	42.9	38.4	33.7	29.2	26.6	24.2	21.8	18.0	14.1	10.3	7.26	4.55	2.21	2.12	0.1
110	31.5	31.5	31.3	30.9	30.2	29.0	26.9	24.5	22.1	20.5	19.0	17.2	14.3	11.2	8.17	5.79	3.72	1.96	1.87	0.1
115	26.6	26.5	26.2	25.1	23.7	22.2	20.9	19.7	18.4	17.3	16.0	14.5	11.9	9.16	6.49	4.52	2.90	1.63	1.61	0.1
120	21.3	21.3	21.1	20.4	19.6	18.7	18.6	18.3	17.7	16.0	13.9	11.5	9.30	7.16	5.20	3.64	2.35	1.34	1.44	0.1
125	19.1	19.3	19.4	19.5	19.5	19.1	18.3	17.1	15.5	13.6	11.5	9.33	7.45	5.73	4.20	2.95	1.94	1.15	1.34	0.1
130	20.8	21.1	21.2	20.7	19.9	18.6	16.3	13.8	11.3	9.88	8.70	7.63	6.21	4.82	3.54	2.53	1.69	1.03	1.20	0.1
135	19.3	18.8	17.8	16.2	14.5	12.7	11.2	9.97	8.85	7.97	7.15	6.32	5.20	4.07	3.01	2.18	1.50	0.95	1.04	0.1
140	12.2	12.0	11.6	11.1	10.4	9.71	8.95	8.15	7.35	6.61	5.87	5.10	4.17	3.25	2.39	1.75	1.23	0.85	0.98	0.1
145	9.57	9.43	9.20	8.88	8.48	7.99	7.38	6.72	6.04	5.49	4.89	4.21	3.1	2.02	1.08	0.66	0.55	0.75	0.85	0.1
150	7.81	7.68	7.48	7.18	6.82	6.40	5.92	5.41	4.89	4.45	3.97	3.40	2.46	1.54	0.75	0.44	0.41	0.67	0.77	0.1
155	5.73	5.60	5.44	5.26	5.06	4.83	4.60	4.33	4.01	3.61	3.15	2.62	1.89	1.18	0.61	0.38	0.38	0.59	0.70	0.1
160	4.32	4.25	4.16	4.04	3.89	3.71	3.56	3.34	2.98	2.22	1.42	0.71	0.50	0.45	0.50	0.48	0.49	0.53	0.64	0.1
165	2.99	2.95	2.89	2.87	2.77	2.66	1.95	1.28	0.68	0.47	0.39	0.39	0.39	0.41	0.45	0.46	0.47	0.48	0.57	0.1
170	0.94	0.69	0.43	0.35	0.31	0.31	0.31	0.32	0.33	0.35	0.36	0.38	0.39	0.41	0.42	0.44	0.45	0.45	0.52	0.1
175	0.34	0.35	0.35	0.36	0.36	0.37	0.38	0.39	0.41	0.42	0.43	0.44	0.45	0.45	0.46	0.47	0.47	0.48	0.52	0.1
180	0.43	0.43	0.42	0.43	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.49	0.50	0.51	0.51	0.51	0.52	0.52	0.51	0.1

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	83.4	84.6	84.9	84.9	84.7	84.7	84.6	84.5	84.4	84.3	84.3	84.1	83.8	83.6	83.4	83.3	83.1	83.3	83.4
5	70.0	65.8	61.7	57.7	53.9	49.9	46.2	42.9	40.1	37.8	36.1	35.4	35.2	35.2	35.3	35.5	35.6	35.5	35.3
10	60.1	52.4	44.1	38.1	35.5	33.3	31.3	29.7	28.8	28.8	29.5	31.9	34.3	36.7	39.1	41.5	43.9	46.3	48.7
15	44.2	39.1	34.6	30.3	27.1	24.1	21.3	18.7	16.3	14.1	12.1	10.3	8.7	7.3	6.1	5.1	4.2	3.4	2.7
20	33.2	29.3	25.9	22.9	20.3	18.1	16.1	14.3	12.7	11.3	10.1	9.1	8.2	7.4	6.7	6.1	5.6	5.1	4.7
25	25.3	22.4	19.9	17.7	15.9	14.3	12.9	11.7	10.7	9.9	9.2	8.6	8.1	7.6	7.2	6.8	6.4	6.1	5.8
30	19.5	17.3	15.4	13.8	12.5	11.4	10.5	9.7	9.0	8.4	7.9	7.4	7.0	6.6	6.3	6.0	5.7	5.4	5.2
35	14.8	13.1	11.7	10.5	9.5	8.6	7.8	7.1	6.6	6.1	5.7	5.3	5.0	4.7	4.4	4.2	4.0	3.8	3.6
40	11.2	10.0	9.0	8.2	7.5	6.8	6.2	5.7	5.3	4.9	4.6	4.3	4.0	3.8	3.5	3.3	3.1	3.0	2.8
45	8.3	7.5	6.8	6.2	5.7	5.2	4.8	4.4	4.1	3.8	3.5	3.3	3.0	2.8	2.6	2.4	2.2	2.1	1.9
50	6.0	5.4	4.9	4.4	4.0	3.7	3.4	3.1	2.9	2.7	2.5	2.3	2.1	1.9	1.8	1.6	1.5	1.3	1.2
55	4.5	4.0	3.6	3.2	2.9	2.6	2.4	2.2	2.0	1.8	1.7	1.5	1.4	1.2	1.1	1.0	0.9	0.8	0.7
60	3.5	3.1	2.8	2.5	2.2	2.0	1.8	1.6	1.5	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4
65	2.8	2.5	2.2	2.0	1.8	1.6	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.3
70	2.3	2.0	1.8	1.6	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2
75	1.9	1.6	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1
80	1.6	1.4	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
85	1.3	1.2	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0
90	1.1	1.0	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
95	0.9	0.8	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
100	0.8	0.7	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
105	0.7	0.6	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
110	0.6	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
115	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
120	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
125	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
130	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
135	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
140	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
145	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
150	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
155	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
160	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
165	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
170	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
175	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	83.6	83.8	84.1	84.3	84.4	84.4	84.5	84.6	84.7	84.7	84.9	84.9	84.6	83.4	81.6				
5	35.2	35.2	35.4	36.1	37.8	40.1	42.9	46.2	49.9	53.9	57.7	61.7	65.8	70.0	74.4				
10	15.0	14.3	13.2	11.9	9.9	7.8	5.9	4.7	3.9	3.5	3.1	2.4	1.2	0.1	0.0				
15	16.0	17.3	18.5	19.4	19.7	19.3	18.1	14.7	11.0	7.4	5.4	4.2	3.9	4.4	5.7				
20	9.4	9.2	8.7	8.1	10.9	13.4	15.8	16.8	17.0	15.9	11.8	7.3	3.7	3.2	4.7				
25	52.8	57.0	62.6	69.7	76.0	84.9	97.5	129	156	171	136	93.0	53.0	45.3	53.4				
30	54.1	52.7	51.9	52.3	56.0	61.9	70.1	84.7	98.7	109	106	98.3	89.0	83.5	78.5				
35	40.1	44.2	48.2	51.7	50.2	49.9	52.7	67.5	85.1	103	116	125	128	118	99.3				
40	19.2	21.4	24.6	29.1	36.4	44.5	52.8	57.3	62.8	71.1	93.8	115	129	122	101				
45	8.48	10.0	12.5	16.1	22.0	28.8	36.3	42.2	49.3	58.4	77.5	95.0	107	103	88.1				
50	3.44	4.07	5.29	7.35	10.5	15.0	20.9	29.3	39.0	49.5	63.0	74.6	82.1	80.0	71.5				
55	1.67	2.02	2.74	3.94	5.41	7.87	11.7	18.2	26.1	35.1	47.4	58.5	66.3	66.0	60.4				
60	0.79	1.06	1.53	2.29	3.12	4.57	6.90	10.6	15.6	22.0	32.5	42.7	50.9	52.8	50.8				
65	0.35	0.63	1.05	1.61	2.15	2.99	4.29	5.83	8.39	12.4	20.8	29.5	37.0	39.9	40.1				
70	0.20	0.45	0.81	1.29	1.78	2.43	3.29	4.00	5.37	7.77	13.2	19.3	25.0	28.3	30.4				
75	0.31	0.54	0.86	1.26	1.69	2.20	2.79	3.14	3.86	5.24	8.48	12.2	16.0	18.9	21.4				
80	0.44	0.62	0.89	1.22	1.62	2.07	2.56	2.94	3.43	4.13	5.35	6.80	8.41	10.0	11.8				
85	0.56	0.69	0.90	1.16	1.49	1.85	2.24	2.53	2.88	3.33	4.10	4.93	5.70	6.20	6.55				
90	0.66	0.75	0.87	1.04	1.28	1.55	1.81	2.02	2.22	2.44	2.79	3.12	3.39	3.49	3.47				
95	0.74	0.76	0.80	0.88	1.03	1.21	1.39	1.50	1.63	1.78	2.06	2.35	2.60	2.68	2.67				
100	0.79	0.80	0.82	0.86	0.96	1.08	1.21	1.29	1.39	1.51	1.72	1.95	2.18	2.36	2.51				
105	0.83	0.83	0.84	0.88	0.95	1.05	1.15	1.21	1.28	1.37	1.54	1.71	1.88	2.01	2.12				
110	0.83	0.83	0.84	0.86	0.93	1.02	1.10	1.15	1.21	1.28	1.41	1.54	1.67	1.78	1.87				
115	0.82	0.82	0.83	0.85	0.91	0.98	1.06	1.09	1.13	1.19	1.29	1.41	1.51	1.58	1.61				
120	0.82	0.82	0.83	0.85	0.90	0.97	1.03	1.06	1.09	1.14	1.26	1.38	1.47	1.48	1.44				
125	0.86	0.86	0.86	0.88	0.92	0.97	1.03	1.04	1.06	1.10	1.24	1.39	1.49	1.45	1.34				
130	0.91	0.91	0.90	0.91	0.93	0.97	1.01	1.02	1.04	1.08	1.18	1.28	1.35	1.31	1.20				
135	0.94	0.93	0.91	0.91	0.92	0.94	0.97	0.99	1.01	1.03	1.08	1.12	1.14	1.11	1.04				
140	0.94	0.92	0.90	0.89	0.89	0.89	0.89	0.90	0.92	0.94	0.97	1.03	1.09	1.11	1.07	0.98			
145	0.91	0.89	0.87	0.85	0.84	0.84	0.84	0.85	0.86	0.88	0.93	0.96	0.97	0.93	0.85				
150	0.85	0.84	0.83	0.82	0.80	0.79	0.79	0.80	0.81	0.83	0.86	0.88	0.88	0.84	0.77				
155	0.77	0.77	0.77	0.77	0.76	0.75	0.75	0.75	0.76	0.78	0.80	0.82	0.82	0.77	0.70				
160	0.71	0.72	0.73	0.73	0.74	0.74	0.74	0.73	0.73	0.72	0.75	0.76	0.76	0.71	0.64				
165	0.59	0.61	0.63	0.65	0.67	0.68	0.69	0.69	0.68	0.67	0.68	0.69	0.68	0.63	0.57				
170	0.40	0.43	0.46	0.50	0.53	0.56	0.58	0.59	0.60	0.60	0.61	0.61	0.60	0.57	0.52				
175	0.41	0.42	0.43	0.45	0.48	0.51	0.54	0.55	0.56	0.56	0.57	0.58	0.57	0.55	0.52				
180	0.44	0.45	0.46	0.48	0.49	0.50	0.51	0.51	0.51	0.50	0.50	0.50	0.50	0.50	0.51				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34L @ 150W / 5000K	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	1.203	143.9	0.997	3.52
277.0	60	0.541	140.1	0.936	8.57

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*****