

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		5574
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		149.0
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		5419
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	144.9
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		37.4
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.85
			277V	6.55
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
			277V	0.920
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4012
		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		-21
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		94
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-16%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		4.6%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		120.0
(Goniophotometer – Section 4.2)		Non-Worst Case		277.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.313
(Goniophotometer – Section 4.2)		Non-Worst Case		0.146
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		37.4
(Goniophotometer – Section 4.2)		Non-Worst Case		37.3

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34S @ 35W / 4000K	230612003-S1
2	Goniophotometer Test	2023-06-13	W34S @ 35W / 4000K	230612003-S1
3	THD and PF Test	2023-06-13	W34S @ 35W / 4000K	230612003-S1

Remark (If any)

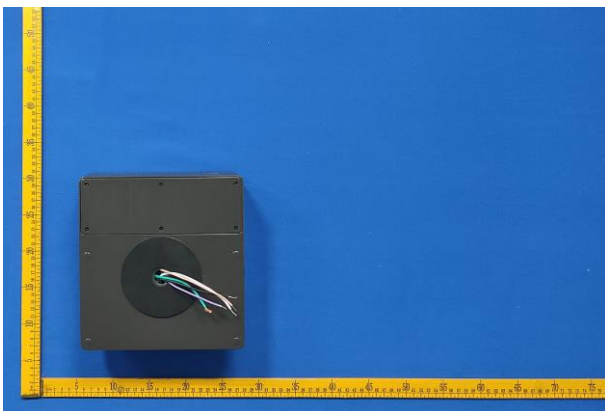
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34S @ 35W / 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.	W34S @ 35W / 4000K	Sample ID	230612003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

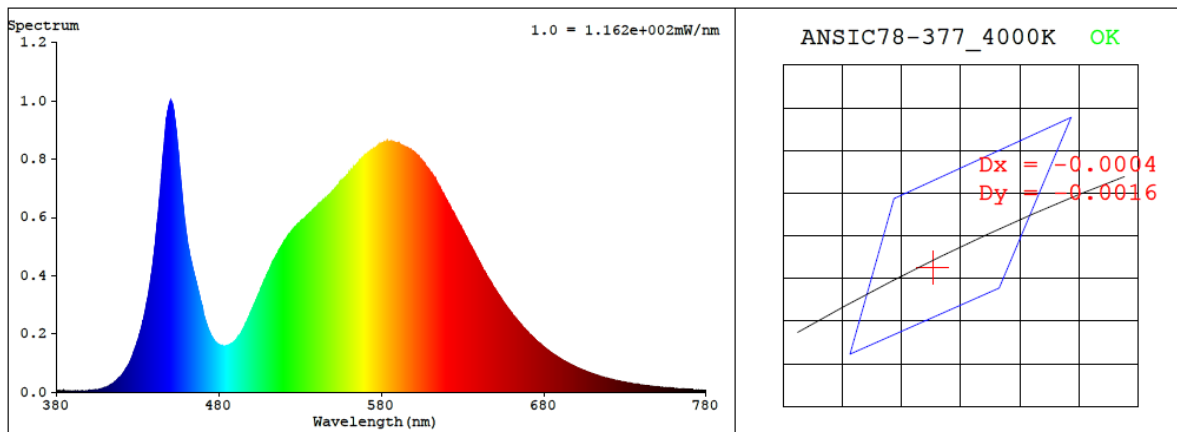
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.313	37.4	0.995
277.0	60	0.146	37.3	0.920

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4012	75.3	-21	-0.0006	77	94	-16%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: x = 0.3795 y = 0.3748 / u' = 0.2253 v' = 0.5006 (duv=-6.39e-04)

CCT= 4012K Prpc WL: Ld=579.4nm Purity=26.4%

Peak WL: Lp=450nm FWHM: =20.7nm Ratio:R=17.2% G=79.9% B=2.9%

Render Index: Ra = 75.3 AvgR = 66.2 TM30:Rf=77 Rg=94

EEL: 0.09298 A++ Highest

R1 =73 R2 =83 R3 =90 R4 =73 R5 =72 R6 =75 R7 =82

R8 =54 R9 =-21 R10=58 R11=70 R12=48 R13=75 R14=94 R15=66

4.1 Integrating Sphere Test

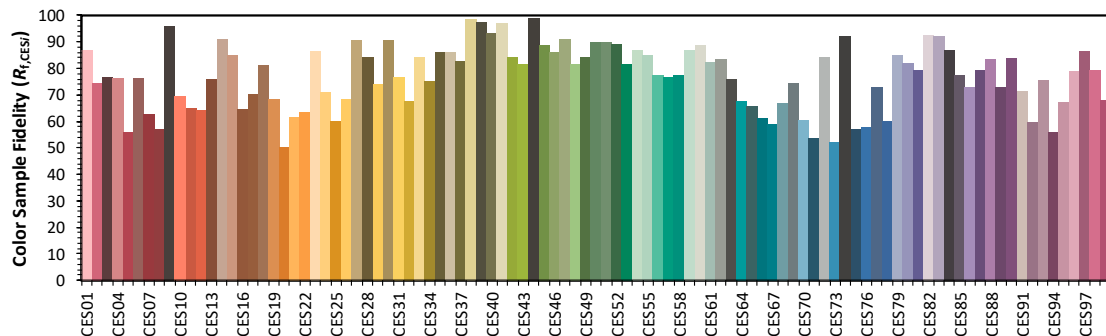
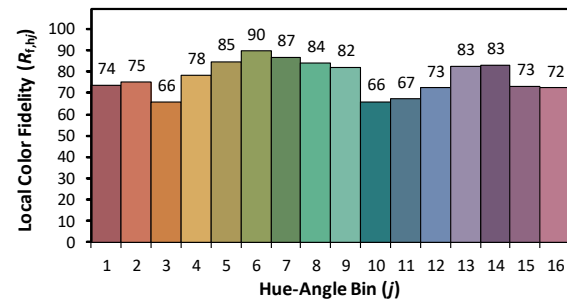
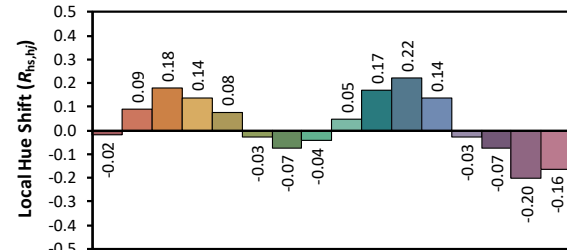
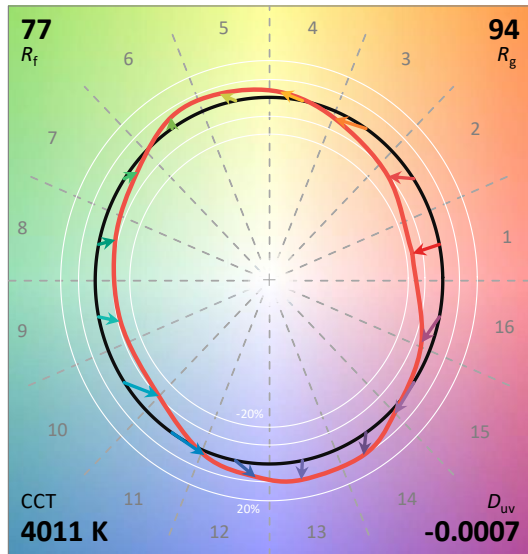
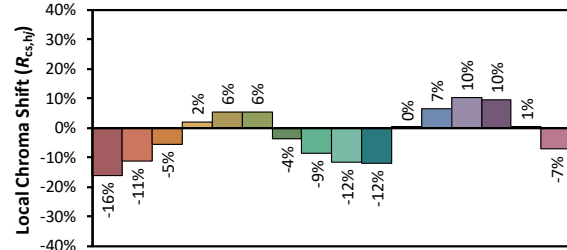
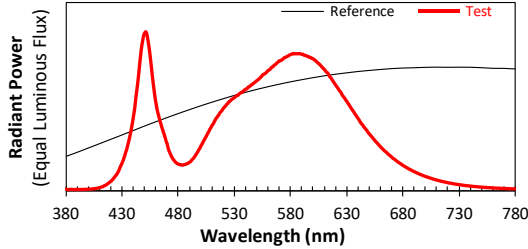
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34S @ 35W / 4000K



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

x 0.3795

y 0.3747

u' 0.2253

v' 0.5005

CIE 13.3-1995
(CRI)

R_a 75

R_g -21

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	5.60E-06	447	8.92E-04	514	4.55E-04	581	8.55E-04	648	3.73E-04	715	5.40E-05
381	4.10E-06	448	9.35E-04	515	4.64E-04	582	8.59E-04	649	3.61E-04	716	5.26E-05
382	2.10E-06	449	9.73E-04	516	4.74E-04	583	8.56E-04	650	3.54E-04	717	5.09E-05
383	4.10E-06	450	9.89E-04	517	4.87E-04	584	8.58E-04	651	3.45E-04	718	4.93E-05
384	4.30E-06	451	9.94E-04	518	4.94E-04	585	8.57E-04	652	3.37E-04	719	4.82E-05
385	4.50E-06	452	9.73E-04	519	5.03E-04	586	8.57E-04	653	3.29E-04	720	4.60E-05
386	3.30E-06	453	9.33E-04	520	5.14E-04	587	8.57E-04	654	3.20E-04	721	4.48E-05
387	3.60E-06	454	8.85E-04	521	5.22E-04	588	8.58E-04	655	3.11E-04	722	4.36E-05
388	2.50E-06	455	8.28E-04	522	5.29E-04	589	8.56E-04	656	3.03E-04	723	4.27E-05
389	3.60E-06	456	7.62E-04	523	5.39E-04	590	8.53E-04	657	2.96E-04	724	4.07E-05
390	3.80E-06	457	6.99E-04	524	5.45E-04	591	8.54E-04	658	2.88E-04	725	3.99E-05
391	3.70E-06	458	6.42E-04	525	5.55E-04	592	8.47E-04	659	2.80E-04	726	3.83E-05
392	3.20E-06	459	5.87E-04	526	5.59E-04	593	8.46E-04	660	2.73E-04	727	3.74E-05
393	4.20E-06	460	5.44E-04	527	5.68E-04	594	8.44E-04	661	2.64E-04	728	3.61E-05
394	3.50E-06	461	5.05E-04	528	5.72E-04	595	8.40E-04	662	2.59E-04	729	3.51E-05
395	3.70E-06	462	4.76E-04	529	5.78E-04	596	8.39E-04	663	2.50E-04	730	3.40E-05
396	4.50E-06	463	4.48E-04	530	5.82E-04	597	8.33E-04	664	2.45E-04	731	3.30E-05
397	4.60E-06	464	4.24E-04	531	5.89E-04	598	8.33E-04	665	2.39E-04	732	3.22E-05
398	4.50E-06	465	3.99E-04	532	5.93E-04	599	8.27E-04	666	2.32E-04	733	3.10E-05
399	5.40E-06	466	3.77E-04	533	5.96E-04	600	8.25E-04	667	2.25E-04	734	2.98E-05
400	5.90E-06	467	3.54E-04	534	6.04E-04	601	8.20E-04	668	2.19E-04	735	2.89E-05
401	6.20E-06	468	3.33E-04	535	6.09E-04	602	8.14E-04	669	2.13E-04	736	2.81E-05
402	6.40E-06	469	3.07E-04	536	6.14E-04	603	8.08E-04	670	2.07E-04	737	2.74E-05
403	7.20E-06	470	2.88E-04	537	6.18E-04	604	8.00E-04	671	2.00E-04	738	2.69E-05
404	8.20E-06	471	2.57E-04	538	6.23E-04	605	7.95E-04	672	1.96E-04	739	2.57E-05
405	8.70E-06	472	2.40E-04	539	6.30E-04	606	7.88E-04	673	1.91E-04	740	2.52E-05
406	9.60E-06	473	2.23E-04	540	6.35E-04	607	7.80E-04	674	1.85E-04	741	2.44E-05
407	1.08E-05	474	2.09E-04	541	6.36E-04	608	7.72E-04	675	1.79E-04	742	2.35E-05
408	1.24E-05	475	1.96E-04	542	6.47E-04	609	7.65E-04	676	1.74E-04	743	2.26E-05
409	1.39E-05	476	1.87E-04	543	6.49E-04	610	7.58E-04	677	1.70E-04	744	2.22E-05
410	1.65E-05	477	1.78E-04	544	6.55E-04	611	7.49E-04	678	1.66E-04	745	2.16E-05
411	1.81E-05	478	1.71E-04	545	6.62E-04	612	7.40E-04	679	1.60E-04	746	2.09E-05
412	2.03E-05	479	1.66E-04	546	6.66E-04	613	7.36E-04	680	1.55E-04	747	2.01E-05
413	2.31E-05	480	1.63E-04	547	6.72E-04	614	7.22E-04	681	1.51E-04	748	1.95E-05
414	2.78E-05	481	1.60E-04	548	6.78E-04	615	7.11E-04	682	1.46E-04	749	1.89E-05
415	2.98E-05	482	1.59E-04	549	6.83E-04	616	7.04E-04	683	1.43E-04	750	1.85E-05
416	3.54E-05	483	1.58E-04	550	6.89E-04	617	6.92E-04	684	1.38E-04	751	1.78E-05
417	4.02E-05	484	1.57E-04	551	6.94E-04	618	6.81E-04	685	1.34E-04	752	1.71E-05
418	4.50E-05	485	1.60E-04	552	7.01E-04	619	6.71E-04	686	1.30E-04	753	1.69E-05
419	5.11E-05	486	1.61E-04	553	7.07E-04	620	6.61E-04	687	1.27E-04	754	1.63E-05
420	5.61E-05	487	1.64E-04	554	7.14E-04	621	6.50E-04	688	1.23E-04	755	1.58E-05
421	6.39E-05	488	1.67E-04	555	7.24E-04	622	6.41E-04	689	1.20E-04	756	1.50E-05
422	7.16E-05	489	1.70E-04	556	7.28E-04	623	6.29E-04	690	1.16E-04	757	1.50E-05
423	8.15E-05	490	1.75E-04	557	7.32E-04	624	6.20E-04	691	1.12E-04	758	1.46E-05
424	8.97E-05	491	1.81E-04	558	7.37E-04	625	6.10E-04	692	1.09E-04	759	1.38E-05
425	9.93E-05	492	1.91E-04	559	7.45E-04	626	5.96E-04	693	1.06E-04	760	1.33E-05
426	1.11E-04	493	1.97E-04	560	7.53E-04	627	5.87E-04	694	1.03E-04	761	1.31E-05
427	1.26E-04	494	2.06E-04	561	7.56E-04	628	5.78E-04	695	9.95E-05	762	1.27E-05
428	1.43E-04	495	2.17E-04	562	7.63E-04	629	5.67E-04	696	9.69E-05	763	1.23E-05
429	1.58E-04	496	2.28E-04	563	7.72E-04	630	5.57E-04	697	9.40E-05	764	1.20E-05
430	1.74E-04	497	2.39E-04	564	7.74E-04	631	5.46E-04	698	9.10E-05	765	1.19E-05
431	1.93E-04	498	2.52E-04	565	7.83E-04	632	5.36E-04	699	8.84E-05	766	1.16E-05
432	2.14E-04	499	2.63E-04	566	7.88E-04	633	5.24E-04	700	8.56E-05	767	1.10E-05
433	2.38E-04	500	2.78E-04	567	7.94E-04	634	5.13E-04	701	8.32E-05	768	1.05E-05
434	2.60E-04	501	2.89E-04	568	8.01E-04	635	5.03E-04	702	8.12E-05	769	1.03E-05
435	2.89E-04	502	3.03E-04	569	8.07E-04	636	4.93E-04	703	7.86E-05	770	1.00E-05
436	3.16E-04	503	3.16E-04	570	8.14E-04	637	4.82E-04	704	7.58E-05	771	9.90E-06
437	3.49E-04	504	3.29E-04	571	8.13E-04	638	4.71E-04	705	7.40E-05	772	9.30E-06
438	3.85E-04	505	3.41E-04	572	8.19E-04	639	4.61E-04	706	7.15E-05	773	9.20E-06
439	4.24E-04	506	3.56E-04	573	8.23E-04	640	4.51E-04	707	6.92E-05	774	9.00E-06
440	4.69E-04	507	3.68E-04	574	8.30E-04	641	4.40E-04	708	6.73E-05	775	8.50E-06
441	5.15E-04	508	3.83E-04	575	8.35E-04	642	4.27E-04	709	6.51E-05	776	8.30E-06
442	5.79E-04	509	3.94E-04	576	8.36E-04	643	4.18E-04	710	6.35E-05	777	8.10E-06
443	6.34E-04	510	4.07E-04	577	8.41E-04	644	4.10E-04	711	6.13E-05	778	7.80E-06
444	6.93E-04	511	4.17E-04	578	8.45E-04	645	3.99E-04	712	5.95E-05	779	7.80E-06
445	7.62E-04	512	4.31E-04	579	8.49E-04	646	3.90E-04	713	5.74E-05	780	7.80E-06
446	8.31E-04	513	4.44E-04	580	8.52E-04	647	3.81E-04	714	5.58E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34S @ 35W / 4000K	Sample ID	230612003-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	40.1

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	0.313	37.4	0.995
NON-WORST CASE	277.0	60	0.146	37.3	0.920

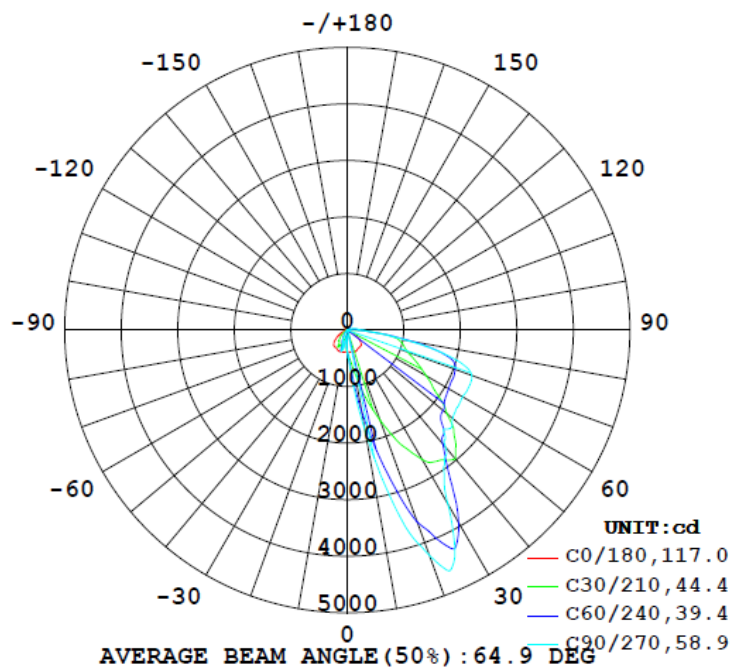
Test Result

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	5574	83.6	131.7	55.0	79.5	149.0	4.5%	B0-U3-G3
0°-90° zones	5419	83.6	131.7	55.0	79.5	144.9	4.6%	B0-U3-G3

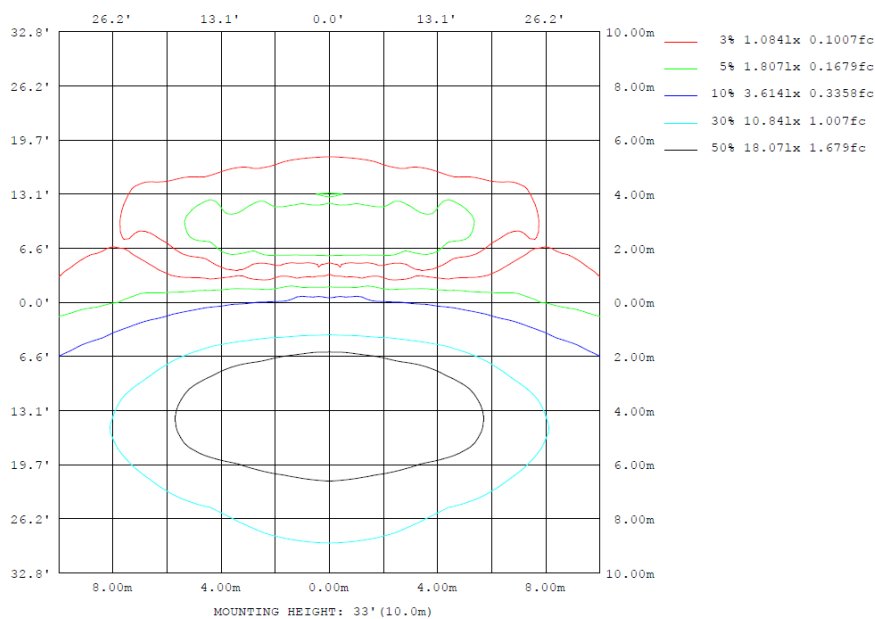
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

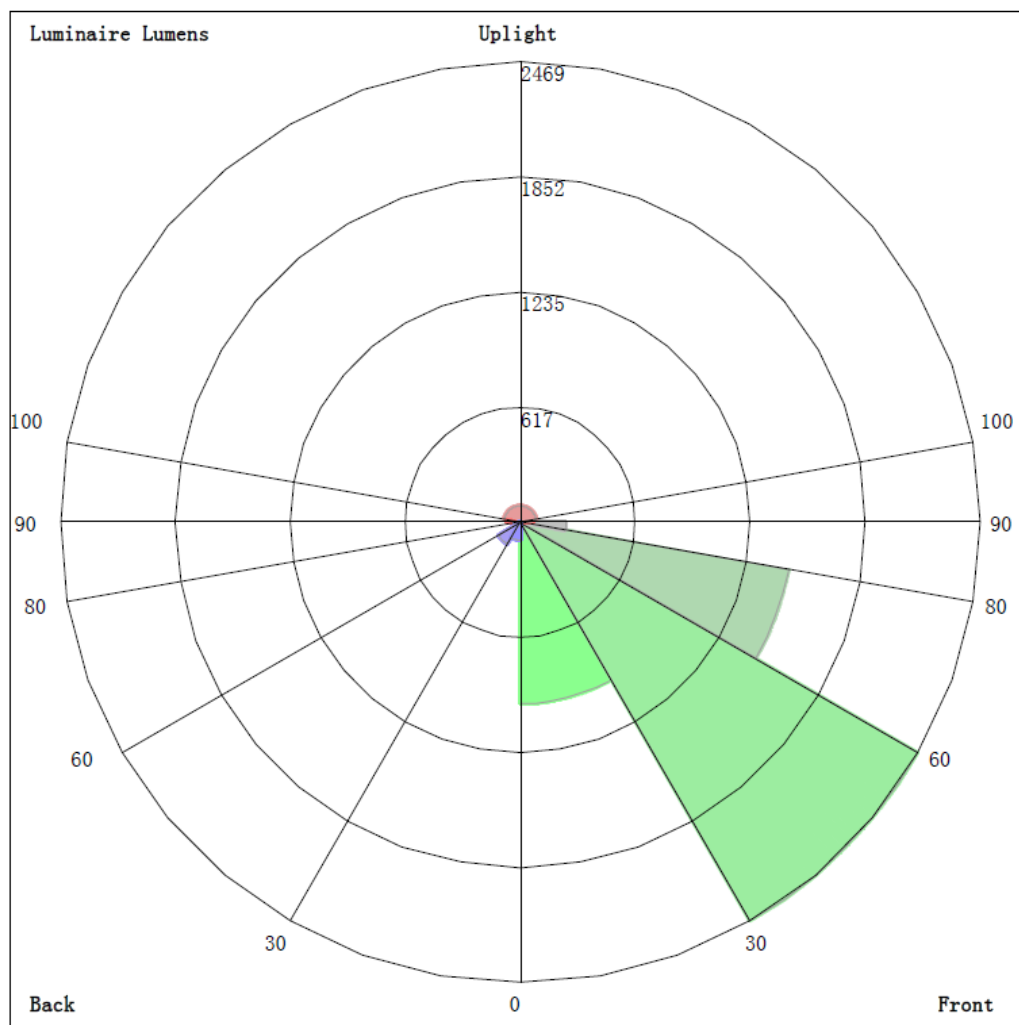
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	zone	total	lum, lamp
10	392.2	1129	1792	1129	392.2	96.34	201.5	96.34	0- 10	46.45	46.45	0.83,0.83
20	409.3	2635	4236	2635	409.3	324.5	216.3	324.5	10- 20	305.6	352.0	6.32,6.32
30	382.6	3883	3558	3883	382.6	241.2	116.9	241.2	20- 30	718.7	1071	19.2,19.2
40	365.2	3149	2699	3149	365.2	127.6	41.35	127.6	30- 40	872.9	1944	34.9,34.9
50	295.5	2209	2433	2209	295.5	57.06	5.598	57.06	40- 50	881.3	2825	50.7,50.7
60	178.2	1875	2355	1875	178.2	19.49	1.536	19.49	50- 60	851.2	3676	66,66
70	94.23	1758	2338	1758	94.23	11.18	0.3276	11.18	60- 70	814.5	4491	80.6,80.6
80	29.97	1267	1116	1267	29.97	7.166	0.8643	7.166	70- 80	678.8	5169	92.7,92.7
90	9.619	222.9	239.7	222.9	9.619	4.189	1.557	4.189	80- 90	249.1	5419	97.2,97.2
100	6.591	99.42	158.5	99.42	6.591	2.991	2.028	2.991	90-100	69.04	5488	98.5,98.5
110	5.352	44.15	68.81	44.15	5.352	2.848	2.144	2.848	100-110	35.07	5523	99.1,99.1
120	3.923	37.71	49.99	37.71	3.923	2.814	2.127	2.814	110-120	20.03	5543	99.4,99.4
130	3.256	25.51	41.49	25.51	3.256	2.890	2.504	2.890	120-130	14.28	5557	99.7,99.7
140	2.595	14.65	25.19	14.65	2.595	2.662	2.705	2.662	130-140	9.636	5567	99.9,99.9
150	2.000	8.930	14.51	8.930	2.000	2.306	2.504	2.306	140-150	4.349	5571	100,100
160	1.570	3.998	6.978	3.998	1.570	2.091	1.927	2.091	150-160	1.955	5573	100,100
170	1.350	0.9957	0.8129	0.9957	1.350	1.618	1.098	1.618	160-170	0.6047	5574	100,100
180	1.521	1.360	1.334	1.360	1.521	1.430	1.217	1.430	170-180	0.1194	5574	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	46.45	0-10	46.45	0.83%
10-20	305.58	0-20	352.03	6.32%
20-30	718.75	0-30	1070.78	19.21%
30-40	872.87	0-40	1943.65	34.87%
40-50	881.31	0-50	2824.96	50.69%
50-60	851.24	0-60	3676.20	65.96%
60-70	814.47	0-70	4490.67	80.57%
70-80	678.76	0-80	5169.43	92.75%
80-90	249.12	0-90	5418.55	97.22%
90-100	69.04	0-100	5487.59	98.46%
100-110	35.07	0-110	5522.66	99.09%
110-120	20.03	0-120	5542.69	99.45%
120-130	14.28	0-130	5556.97	99.70%
130-140	9.64	0-140	5566.61	99.88%
140-150	4.35	0-150	5570.96	99.95%
150-160	1.96	0-160	5572.92	99.99%
160-170	0.60	0-170	5573.52	100.00%
170-180	0.12	0-180	5573.64	100.00%

4.2 Goniophotometer Test

LCS/BUG

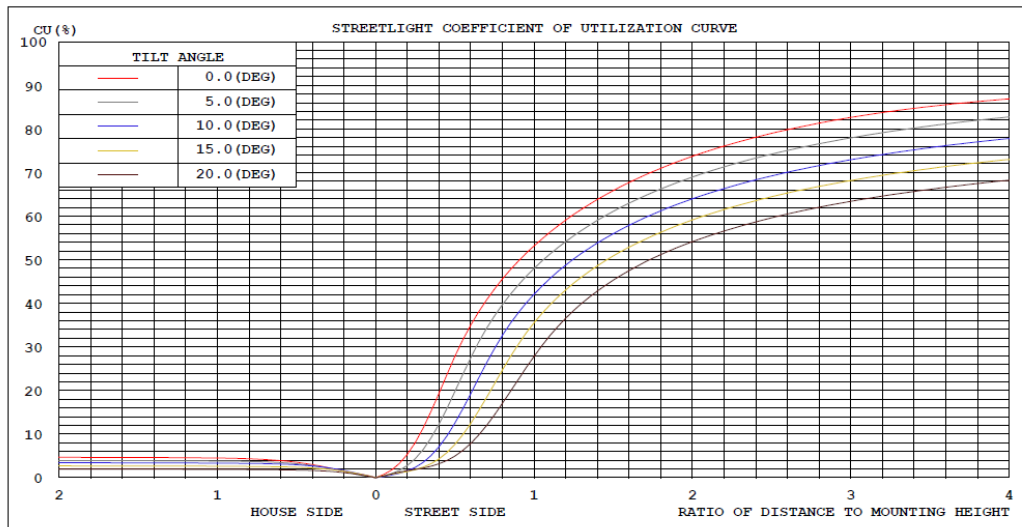


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

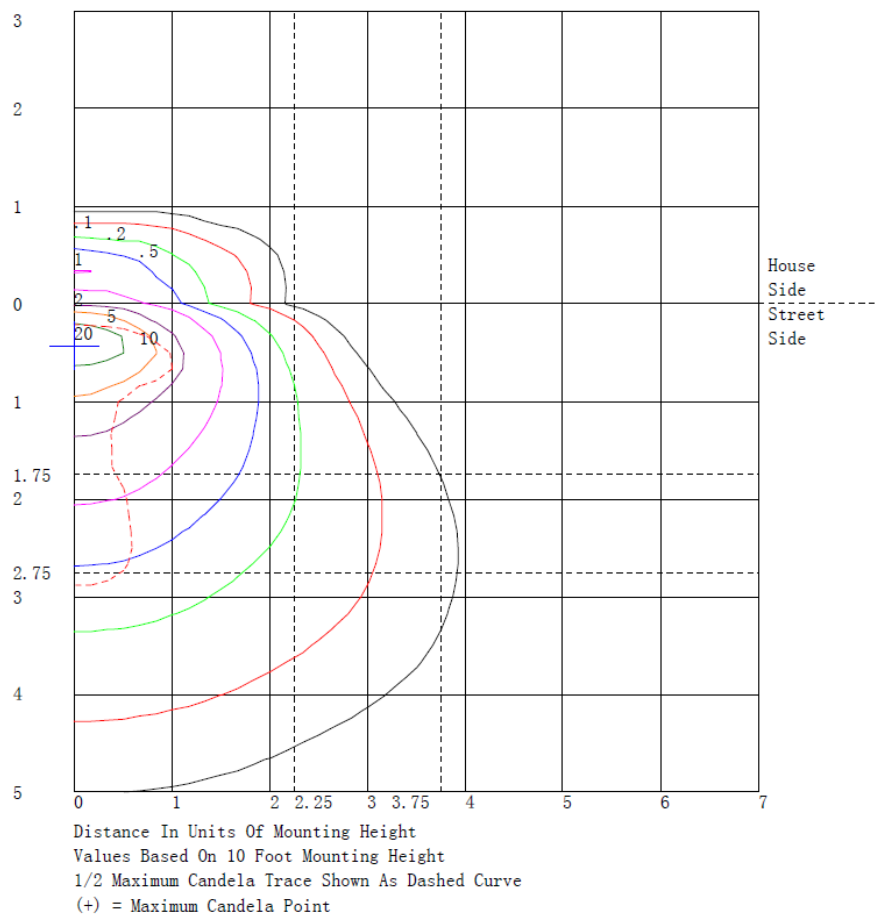
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	975.0	N.A.	17.5
FM - Front-Medium (30-60)	2469.4	N.A.	44.3
FH - Front-High (60-80)	1463.5	N.A.	26.3
FVH - Front-Very High (80-90)	244.9	N.A.	4.4
BL - Back-Low (0-30)	95.7	N.A.	1.7
BM - Back-Medium (30-60)	136.0	N.A.	2.4
BH - Back-High (60-80)	29.8	N.A.	0.5
BVH - Back-Very High (80-90)	4.2	N.A.	0.1
UL - Uplight-Low (90-100)	69.0	N.A.	1.2
UH - Uplight-High (100-180)	86.0	N.A.	1.5
Total	5573.5	N.A.	100.0
BUG Rating	B0-U3-G3		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG) y (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	388	388	388	389	389	389	390	390	390	391	391	392	392	393	393	394	395	395	396
5	391	404	421	441	465	491	518	541	564	587	615	644	672	698	722	743	759	769	775
10	392	429	477	535	603	683	775	887	1007	1129	1245	1356	1459	1553	1635	1702	1750	1780	1792
15	403	454	539	658	823	1012	1218	1422	1632	1846	2068	2286	2494	2682	2848	2988	3098	3174	3209
20	409	516	666	860	1111	1395	1700	2004	2316	2635	2984	3316	3609	3796	3933	4034	4134	4203	4236
25	400	564	784	1060	1417	1811	2223	2624	3012	3378	3711	4000	4230	4356	4428	4462	4483	4488	4483
30	383	584	855	1196	1647	2137	2636	3123	3550	3883	3992	4000	3938	3852	3748	3646	3594	3565	3558
35	380	592	882	1250	1762	2302	2819	3236	3549	3728	3607	3390	3148	3055	2999	2970	2957	2958	2966
40	365	577	878	1268	1860	2456	2968	3157	3207	3149	2989	2799	2629	2629	2669	2723	2719	2709	2699
45	345	627	952	1321	1825	2304	2685	2735	2673	2552	2488	2428	2381	2374	2384	2404	2432	2459	2478
50	296	607	928	1258	1659	2023	2306	2339	2292	2209	2195	2194	2210	2265	2329	2388	2416	2430	2433
55	233	558	865	1153	1448	1706	1909	1982	2007	2008	2038	2071	2112	2181	2252	2317	2352	2372	2377
60	178	483	761	1012	1242	1441	1608	1721	1806	1875	1942	2006	2070	2154	2234	2302	2337	2353	2355
65	134	362	580	788	989	1179	1357	1522	1670	1801	1897	1980	2056	2153	2243	2317	2355	2372	2372
70	94.2	207	344	505	703	916	1136	1361	1573	1758	1871	1958	2030	2126	2214	2286	2322	2339	2338
75	57.1	108	203	342	549	784	1029	1266	1482	1664	1763	1826	1865	1908	1940	1960	1965	1962	1955
80	30.0	59.2	135	257	461	685	904	1064	1187	1267	1267	1235	1189	1171	1156	1143	1130	1121	1116
85	19.0	51.8	103	174	285	399	499	539	556	553	534	508	482	474	471	471	467	465	464
90	9.62	19.0	34.9	57.1	90.8	127	162	189	209	223	222	218	213	219	226	233	237	239	240
95	7.42	11.1	18.8	30.4	47.4	67.4	89.3	114	137	156	162	165	167	176	185	193	198	200	201
100	6.59	10.5	15.8	22.4	29.8	38.9	50.1	66.3	83.4	99.4	109	118	125	135	144	152	156	158	159
105	6.41	9.66	13.7	18.6	24.7	31.2	38.0	44.1	50.3	57.0	65.1	73.7	82.7	92.9	102	110	114	115	115
110	5.35	7.71	11.0	15.2	21.2	27.5	33.5	37.4	40.8	44.2	49.0	53.9	58.6	62.5	65.7	68.0	68.9	69.0	68.8
115	4.46	6.37	9.22	13.0	18.5	24.4	29.9	33.2	35.9	38.5	41.9	45.4	48.9	52.6	55.8	58.2	58.5	58.2	57.7
120	3.92	5.74	8.03	10.8	14.0	17.7	21.9	27.5	32.9	37.7	39.9	41.4	42.6	45.3	47.8	49.9	50.3	50.3	50.0
125	3.58	4.65	6.28	8.47	11.1	14.4	18.4	24.6	30.9	36.4	38.8	40.1	40.8	42.1	43.2	43.9	43.7	43.3	42.9
130	3.26	3.71	4.81	6.56	9.22	12.3	15.7	18.6	21.7	25.5	31.8	37.9	43.0	44.0	43.6	42.5	42.1	41.7	41.5
135	2.90	2.98	3.70	5.07	7.50	10.3	13.0	14.7	16.3	18.3	21.3	25.0	29.6	36.3	43.2	49.4	52.6	54.5	55.0
140	2.60	2.42	2.83	3.81	5.74	7.99	10.3	11.8	13.2	14.7	16.4	18.3	20.1	21.7	23.2	24.4	24.9	25.2	25.2
145	2.29	1.65	1.64	2.24	3.82	5.75	7.75	9.04	10.2	11.4	12.8	14.3	15.6	16.8	17.8	18.5	18.8	18.8	18.7
150	2.00	1.39	1.26	1.61	2.67	4.03	5.51	6.70	7.84	8.93	10.0	11.0	12.0	12.8	13.6	14.1	14.4	14.5	14.5
155	1.73	1.39	1.30	1.47	1.94	2.63	3.48	4.53	5.63	6.70	7.55	8.29	8.89	9.32	9.61	9.80	9.88	9.89	9.85
160	1.57	1.50	1.46	1.44	1.35	1.37	1.56	2.26	3.11	4.00	4.70	5.32	5.87	6.33	6.69	6.94	7.02	7.02	6.98
165	1.42	1.40	1.38	1.35	1.30	1.25	1.22	1.21	1.27	1.42	1.80	2.25	2.70	3.05	3.34	3.57	3.71	3.80	3.84
170	1.35	1.33	1.30	1.27	1.23	1.19	1.14	1.09	1.04	1.00	0.95	0.91	0.87	0.84	0.81	0.80	0.79	0.79	0.81
175	1.41	1.40	1.39	1.37	1.34	1.32	1.29	1.26	1.23	1.19	1.16	1.12	1.09	1.06	1.03	1.01	1.00	1.00	1.02
180	1.52	1.51	1.50	1.49	1.48	1.46	1.44	1.42	1.39	1.36	1.34	1.31	1.29	1.27	1.26	1.25	1.26	1.29	1.33

																			UNIT: cd	
C (DEG) y (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	
0	395	395	394	393	393	392	392	392	391	391	390	390	389	389	389	388	388	388	393	
5	769	759	743	722	698	672	644	615	587	564	541	518	491	465	441	421	404	391	394	
10	1780	1750	1702	1635	1553	1459	1356	1245	1129	1007	887	775	683	603	535	477	429	392	325	
15	3174	3098	2988	2848	2682	2494	2286	2068	1846	1632	1422	1218	1012	823	658	539	454	403	291	
20	4203	4134	4034	3933	3796	3609	3316	2984	2635	2316	2004	1700	1395	1111	860	666	516	409	273	
25	4488	4483	4462	4428	4356	4230	4000	3711	3378	3012	2624	2223	1811	1417	1060	784	564	400	250	
30	3565	3594	3646	3748	3852	3938	4000	3992	3883	3550	3123	2636	2137	1647	1196	855	584	383	244	
35	2958	2957	2970	2999	3055	3148	3390	3607	3728	3549	3236	2819	2302	1762	1250	882	592	380	283	
40	2709	2719	2723	2669	2629	2629	2799	2989	3149	3207	3157	2968	2456	1860	1268	878	577	365	307	
45	2459	2432	2404	2384	2374	2381	2428	2488	2552	2673	2735	2685	2304	1825	1321	952	627	345	311	
50	2430	2416	2388	2329	2265	2210	2194	2195	2209	2292	2339	2306	2023	1659	1258	928	607	296	280	
55	2372	2352	2317	2252	2181	2112	2071	2038	2008	2007	1982	1909	1706	1448	1153	865	558	233	223	
60	2353	2337	2302	2234	2154	2070	2006	1942	1875	1806	1721	1608	1441	1242	1012	761	483	178	185	
65	2372	2355	2317	2243	2153	2056	1980	1897	1801	1670	1522	1357	1179	989	788	580	362	134	140	
70	2339	2322	2286	2214	2126	2030	1958	1871	1758	1573	1361	1136	916	703	505	344	207	94.2	89.4	
75	1962	1965	1960	1940	1908	1865	1826	1763	1664	1482	1266	1029	784	549	342	203	108	57.1	51.9	
80	1121	1130	1143	1156	1171	1189	1235	1267	1267	1187	1064	904	685	461	257	135	59.2	30.0	28.8	
85	465	467	471	471	474	482	508	534	553	556	539	499	399	285	174	103	51.8	19.0	19.5	
90	239	237	233	226	219	213	218	222	223	209	189	162	127	90.8	57.1	34.9	19.0	9.62	9.31	
95	200	198	193	185	176	167	165	162	156	137	114	89.3	67.4	47.4	30.4	18.8	11.1	7.42	7.46	
100	158	156	152	144	135	125	118	109	99.4	83.4	66.3	50.1	38.9	29.8	22.4	15.8	10.5	6.59	6.34	
105	115	114	110	102	92.9	82.7	73.7	65.1	57.0	50.3	44.1	38.0	31.2	24.7	18.6	13.7	9.66	6.41	6.28	
110	69.0	68.9	68.0	65.7	62.5	58.6	53.9	49.0	44.2	40.8	37.4	33.5	27.5	21.2	15.2	11.0	7.71	5.35	5.70	
115	58.2	58.5	58.2	55.8	52.6	48.9	45.4	41.9	38.5	35.9	33.2	29.9	24.4	18.5	13.0	9.22	6.37	4.46	5.46	
120	50.3	50.3	49.9	47.8	45.3	42.6	41.4	39.9	37.7	32.9	27.5	21.9	17.7	14.0	10.8	8.03	5.74	3.92	5.50	
125	43.3	43.7	43.9	43.2	42.1	40.8	40.1	38.8	36.4	30.9	24.6	18.4	14.4	11.1	8.47	6.28	4.65	3.58	4.82	
130	41.7	42.1	42.5	43.6	44.0	43.0	37.9	31.8	25.5	21.7	18.6	15.7	12.3	9.22	6.56	4.81	3.71	3.26	3.84	
135	54.5	52.6	49.4	43.2	36.3	29.6	25.0	21.3	18.3	16.3	14.7	13.0	10.3	7.50	5.07	3.70	2.98	2.90	3.35	
140	25.2	24.9	24.4	23.2	21.7	20.1	18.3	16.4	14.7	13.2	11.8	10.3	7.99	5.74	3.81	2.83	2.42	2.60	2.87	
145	18.8	18.8	18.5	17.8	16.8	15.6	14.3	12.8	11.4	10.2	9.04	7.75	5.75	3.82	2.4	1.64	1.65	2.29	2.45	
150	14.5	14.4	14.1	13.6	12.8	12.0	11.0	10.0	8.93	7.94	6.70	5.51	4.03	2.67	1.61	1.26	1.39	2.00	2.24	
155	9.89	9.88	9.80	9.61	9.32	8.89	8.29	7.55	6.70	5.63	4.53	3.48	2.63	1.94	1.47	1.30	1.39	1.73	2.02	
160	7.02	7.02	6.94	6.69	6.33	5.87	5.32	4.70	4.00	3.11	2.26	1.56	1.37	1.35	1.44	1.46	1.50	1.57	1.85	
165	3.80	3.71	3.57	3.34	3.05	2.70	2.25	1.80	1.42	1.27	1.21	1.22	1.25	1.30	1.35	1.38	1.40	1.42	1.65	
170	0.79	0.79	0.80	0.81	0.84	0.87	0.91	0.95	1.00	1.04	1.09	1.14	1.19	1.23	1.27	1.30	1.33	1.35	1.48	
175	1.00	1.00	1.01	1.03	1.06	1.09	1.12	1.16	1.19	1.23	1.26	1.29	1.32	1.34	1.37	1.39	1.40	1.41	1.45	
180	1.29	1.26	1.25	1.26	1.27	1.29	1.31	1.34	1.36	1.39	1.42	1.44	1.46	1.48	1.49	1.50	1.51	1.52	1.47	

Table--3

UNIT: cd

C (DEG) y (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	396	399	399	399	399	398	398	398	398	398	398	397	397	396	396	396	396	396	396
5	387	368	331	288	243	205	172	146	134	127	125	122	120	119	117	117	116	117	117
10	267	217	176	144	120	105	97.5	96.3	100	109	122	142	163	182	193	199	202	199	193
15	204	142	105	91.9	101	141	193	247	282	309	327	329	326	322	333	343	350	343	333
20	178	126	132	167	217	260	298	325	317	298	272	254	236	223	217	215	216	215	217
25	153	110	155	227	299	294	273	246	241	238	233	220	206	192	183	177	174	177	183
30	159	127	188	272	349	332	292	241	212	186	165	151	140	132	125	119	117	119	125
35	216	179	191	218	245	230	205	176	150	126	107	97.9	93.2	91.3	88.5	86.8	86.2	86.8	88.5
40	264	236	237	243	245	211	169	128	104	86.9	73.5	60.7	50.8	43.7	41.0	40.5	41.3	40.5	41.0
45	280	252	227	204	181	152	123	96.3	75.3	57.8	43.7	33.9	26.9	22.2	18.6	16.6	16.0	16.6	18.6
50	259	235	202	168	134	105	79.2	57.1	40.5	27.8	18.5	12.5	8.88	7.00	5.77	5.40	5.60	5.40	5.77
55	207	187	159	128	97.8	71.1	47.9	29.2	19.3	13.6	10.6	7.18	4.85	3.44	2.82	2.71	2.92	2.71	2.82
60	181	167	134	96.8	60.9	41.7	28.3	19.5	13.3	9.62	7.45	4.92	3.06	1.83	1.38	1.34	1.54	1.34	1.38
65	137	125	96.4	64.1	34.1	22.7	16.9	14.6	10.7	7.70	5.41	3.36	1.81	0.76	0.40	0.38	0.55	0.38	0.40
70	81.9	71.7	56.0	39.7	24.9	18.0	13.7	11.2	8.23	5.88	4.04	2.41	1.18	0.34	0.11	0.15	0.33	0.15	0.11
75	46.1	39.8	31.9	24.2	17.3	13.3	10.5	8.46	6.45	4.81	3.46	2.22	1.24	0.55	0.37	0.41	0.55	0.41	0.37
80	27.0	24.5	20.8	16.8	13.0	10.6	8.71	7.17	5.66	4.36	3.24	2.24	1.43	0.86	0.72	0.75	0.86	0.75	0.72
85	19.1	17.9	15.3	12.4	9.52	7.96	6.77	5.81	4.72	3.74	2.88	2.16	1.59	1.20	1.10	1.12	1.21	1.12	1.10
90	8.87	8.30	7.51	6.66	5.83	5.24	4.70	4.19	3.55	2.94	2.39	2.01	1.72	1.54	1.49	1.51	1.56	1.51	1.49
95	7.29	6.93	6.22	5.41	4.61	4.09	3.66	3.27	2.84	2.45	2.13	1.95	1.85	1.80	1.79	1.81	1.83	1.81	1.79
100	6.04	5.69	5.26	4.80	4.33	3.85	3.40	2.99	2.64	2.36	2.14	2.04	1.99	1.99	1.99	2.01	2.03	2.01	1.99
105	6.04	5.67	5.09	4.46	3.85	3.48	3.18	2.93	2.65	2.40	2.21	2.13	2.10	2.11	2.12	2.14	2.15	2.14	2.12
110	5.79	5.63	5.06	4.36	3.66	3.31	3.05	2.85	2.60	2.38	2.20	2.13	2.11	2.12	2.12	2.13	2.14	2.13	2.12
115	5.99	6.07	5.38	4.45	3.51	3.16	2.96	2.83	2.60	2.38	2.21	2.14	2.11	2.11	2.11	2.12	2.13	2.12	2.11
120	6.41	6.66	5.81	4.61	3.39	3.03	2.87	2.81	2.60	2.41	2.25	2.18	2.15	2.14	2.13	2.13	2.13	2.13	2.13
125	5.56	5.79	5.18	4.31	3.40	3.10	2.94	2.86	2.68	2.52	2.40	2.34	2.31	2.30	2.29	2.28	2.27	2.28	2.29
130	4.20	4.33	4.11	3.75	3.36	3.16	3.01	2.89	2.75	2.64	2.56	2.53	2.53	2.52	2.51	2.50	2.51	2.51	2.52
135	3.64	3.78	3.68	3.48	3.24	3.08	2.94	2.82	2.72	2.65	2.61	2.62	2.64	2.67	2.68	2.68	2.67	2.68	2.68
140	3.06	3.18	3.18	3.13	3.03	2.91	2.78	2.66	2.60	2.57	2.56	2.59	2.64	2.68	2.70	2.71	2.71	2.71	2.70
145	2.63	2.72	2.72	2.69	2.63	2.57	2.51	2.46	2.45	2.46	2.51	2.56	2.61	2.63	2.65	2.64	2.65	2.65	2.63
150	2.42	2.52	2.52	2.48	2.41	2.37	2.33	2.31	2.31	2.34	2.37	2.41	2.44	2.48	2.50	2.51	2.50	2.51	2.50
155	2.22	2.34	2.34	2.29	2.21	2.18	2.16	2.15	2.17	2.19	2.22	2.23	2.24	2.25	2.25	2.24	2.23	2.24	2.25
160	2.06	2.18	2.18	2.13	2.07	2.07	2.08	2.09	2.10	2.10	2.09	2.08	2.06	2.04	2.01	1.97	1.93	1.97	2.01
165	1.82	1.93	1.95	1.93	1.89	1.91	1.93	1.94	1.92	1.89	1.85	1.80	1.75	1.69	1.64	1.60	1.56	1.60	1.64
170	1.58	1.65	1.66	1.65	1.62	1.63	1.63	1.62	1.57	1.50	1.41	1.32	1.24	1.16	1.12	1.10	1.10	1.10	1.12
175	1.54	1.57	1.58	1.57	1.56	1.55	1.53	1.49	1.43	1.35	1.27	1.21	1.17	1.14	1.13	1.13	1.14	1.13	1.13
180	1.43	1.40	1.40	1.40	1.41	1.42	1.43	1.43	1.42	1.40	1.37	1.33	1.29	1.25	1.23	1.22	1.22	1.22	1.23

C (DEG)																UNIT: cd			
γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	396	397	397	398	398	398	398	398	398	399	399	399	399	396	393				
5	119	120	122	125	127	134	146	172	205	243	288	331	368	387	394				
10	182	163	142	122	109	100	96.3	97.5	105	120	144	176	217	267	325				
15	322	326	329	327	309	282	247	193	141	101	91.9	105	142	204	291				
20	223	236	254	272	298	317	325	298	260	217	167	132	126	178	273				
25	192	206	220	233	238	241	246	273	294	299	227	155	110	153	250				
30	132	140	151	165	186	212	241	292	332	349	272	188	127	159	244				
35	91.3	93.2	97.9	107	126	150	176	205	230	245	218	191	179	216	283				
40	43.7	50.8	60.7	73.5	86.9	104	128	169	211	245	243	237	236	264	307				
45	22.2	26.9	33.9	43.7	57.8	75.3	96.3	123	152	181	204	227	252	280	311				
50	7.00	8.88	12.5	18.5	27.8	40.5	57.1	79.2	105	134	168	202	235	259	280				
55	3.44	4.85	7.18	10.6	13.6	19.3	29.2	47.9	71.1	97.8	128	159	187	207	223				
60	1.83	3.06	4.92	7.45	9.62	13.3	19.5	28.3	41.7	60.9	96.8	134	167	181	185				
65	0.76	1.81	3.36	5.41	7.70	10.7	14.6	16.9	22.7	34.1	64.1	96.4	125	137	140				
70	0.34	1.18	2.41	4.04	5.88	8.23	11.2	13.7	18.0	24.9	39.7	56.0	71.7	81.9	89.4				
75	0.55	1.24	2.22	3.46	4.81	6.45	8.46	10.5	13.3	17.3	24.2	31.9	39.8	46.1	51.9				
80	0.86	1.43	2.24	3.24	4.36	5.66	7.17	8.71	10.6	13.0	16.8	20.8	24.5	27.0	28.8				
85	1.20	1.59	2.16	2.88	3.74	4.72	5.81	6.77	7.96	9.52	12.4	15.3	17.9	19.1	19.5				
90	1.54	1.72	2.01	2.39	2.94	3.55	4.19	4.70	5.24	5.83	6.66	7.51	8.30	8.87	9.31				
95	1.80	1.85	1.95	2.13	2.45	2.84	3.27	3.66	4.09	4.61	5.41	6.22	6.93	7.29	7.46				
100	1.99	1.99	2.04	2.14	2.36	2.64	2.99	3.40	3.85	4.33	4.80	5.26	5.69	6.04	6.34				
105	2.11	2.10	2.13	2.21	2.40	2.65	2.93	3.18	3.48	3.85	4.46	5.09	5.67	6.04	6.28				
110	2.12	2.11	2.13	2.20	2.38	2.60	2.85	3.05	3.31	3.66	4.36	5.06	5.63	5.79	5.70				
115	2.11	2.11	2.14	2.21	2.38	2.60	2.83	2.96	3.16	3.51	4.45	5.38	6.07	5.99	5.46				
120	2.14	2.15	2.18	2.25	2.41	2.60	2.81	2.87	3.03	3.39	4.61	5.81	6.66	6.41	5.50				
125	2.30	2.31	2.34	2.40	2.52	2.68	2.86	2.94	3.10	3.40	4.31	5.18	5.79	5.56	4.82				
130	2.53	2.53	2.53	2.56	2.64	2.75	2.89	3.01	3.16	3.36	3.75	4.11	4.33	4.20	3.84				
135	2.67	2.64	2.62	2.61	2.65	2.72	2.82	2.94	3.08	3.24	3.48	3.68	3.78	3.64	3.35				
140	2.68	2.64	2.59	2.56	2.57	2.60	2.66	2.78	2.91	3.03	3.13	3.18	3.18	3.06	2.87				
145	2.61	2.56	2.51	2.46	2.45	2.45	2.46	2.51	2.57	2.63	2.69	2.72	2.72	2.63	2.49				
150	2.48	2.44	2.41	2.37	2.34	2.31	2.31	2.33	2.37	2.41	2.48	2.52	2.52	2.42	2.24				
155	2.25	2.24	2.23	2.22	2.19	2.17	2.15	2.16	2.18	2.21	2.29	2.34	2.34	2.22	2.02				
160	2.04	2.06	2.08	2.09	2.10	2.10	2.09	2.08	2.07	2.07	2.13	2.18	2.18	2.06	1.85				
165	1.69	1.75	1.80	1.85	1.89	1.92	1.94	1.93	1.91	1.89	1.93	1.95	1.93	1.82	1.65				
170	1.16	1.24	1.32	1.41	1.50	1.57	1.62	1.63	1.63	1.62	1.65	1.66	1.65	1.58	1.48				
175	1.14	1.17	1.21	1.27	1.35	1.43	1.49	1.53	1.55	1.56	1.57	1.58	1.57	1.54	1.49				
180	1.25	1.29	1.33	1.37	1.40	1.42	1.43	1.43	1.42	1.41	1.40	1.40	1.40	1.43	1.47				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34S @ 35W / 4000K	Sample ID	230612003-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 $25 \pm 1^{\circ}\text{C}$. 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	0.313	37.4	0.995	2.85
277.0	60	0.146	37.3	0.920	6.55

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*****