

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

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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		5453
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		140.5
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		5302
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	136.6
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		38.8
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.81
			277V	6.21
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
			277V	0.923
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5073
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		74.3
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-28
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%		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		0.325
(Goniophotometer – Section 4.2)		Non-Worst Case		0.151
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		38.8
(Goniophotometer – Section 4.2)		Non-Worst Case		38.5

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34S @ 35W / 5000K	230612003-S1
2	Goniophotometer Test	2023-06-13	W34S @ 35W / 5000K	230612003-S1
3	THD and PF Test	2023-06-13	W34S @ 35W / 5000K	230612003-S1

Remark (If any)

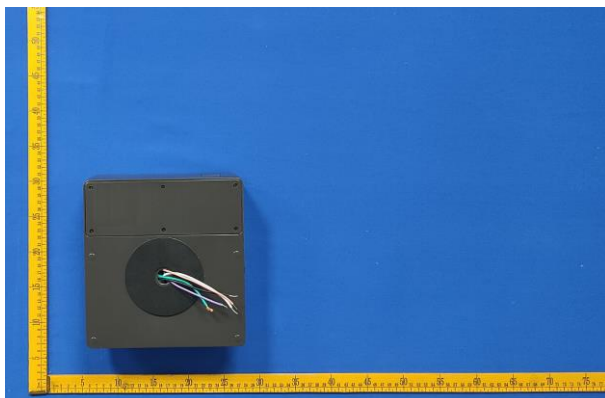
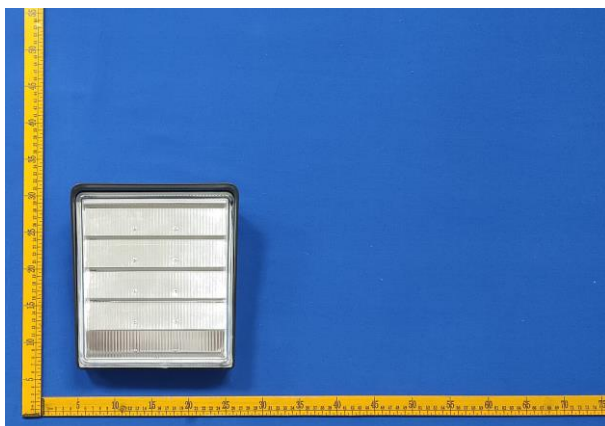
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34S @ 35W / 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.	W34S @ 35W / 5000K	Sample ID	230612003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

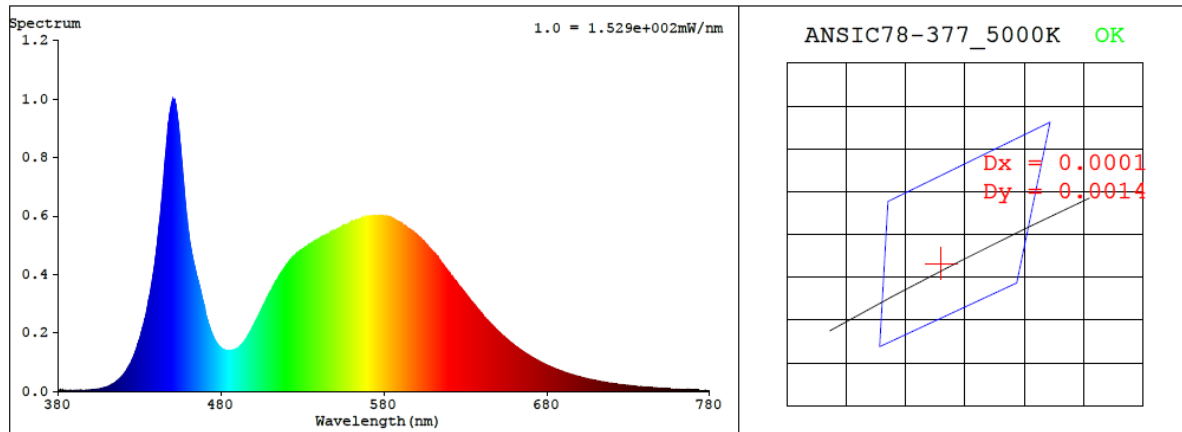
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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. 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	0.325	38.8	0.995
277.0	60	0.151	38.5	0.923

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5073	74.3	-28	0.0007	75	94	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3432$ $y = 0.3514$ / $u' = 0.2102$ $v' = 0.4843$ ($duv=6.50e-04$)

CCT= 5073K Prcp WL: Ld=571.0nm Purity=8.4%

Peak WL: Lp=450nm FWHM: =20.6nm Ratio:R=14.4% G=82.0% B=3.6%

Render Index: Ra = 74.3 AvgR = 64.5 TM30:Rf=75 Rg=93

EEL: 0.09840 A++ Highest

R1 =71	R2 =80	R3 =86	R4 =74	R5 =73	R6 =72	R7 =82
R8 =56	R9 =-28	R10=52	R11=70	R12=47	R13=73	R14=92 R15=66

4.1 Integrating Sphere Test

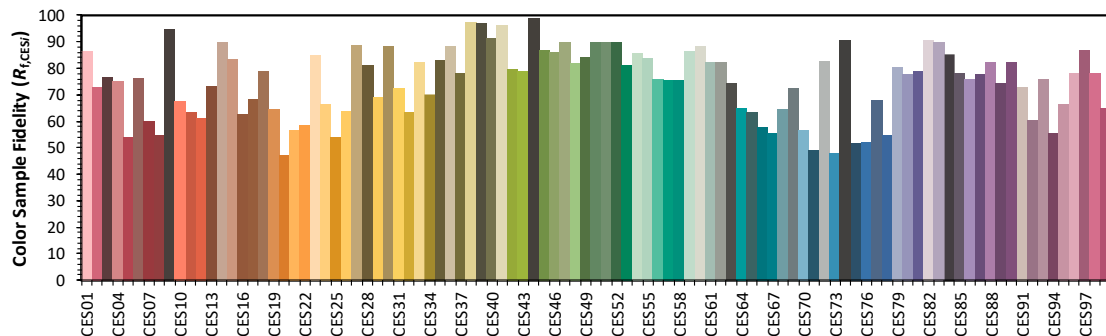
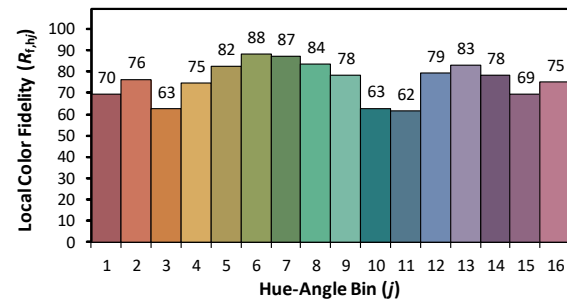
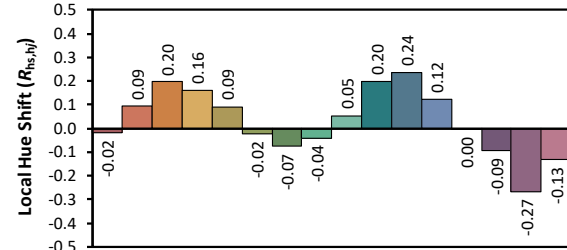
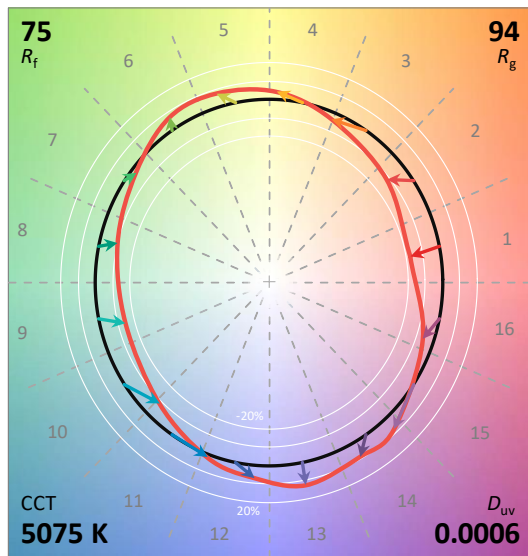
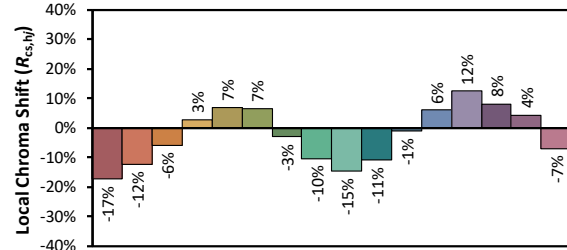
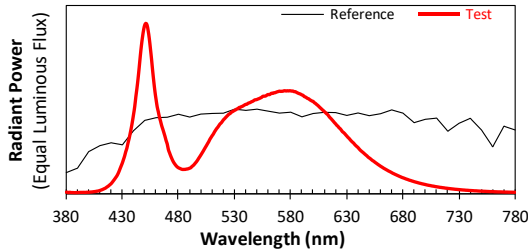
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34S @ 35W / 5000K



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

x 0.3431

y 0.3512

u' 0.2103

v' 0.4842

CIE 13.3-1995
(CRI)

R_a 74

R_g -28

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	5.30E-06	447	8.68E-04	514	3.79E-04	581	5.99E-04	648	2.18E-04	715	3.20E-05
381	5.40E-06	448	9.19E-04	515	3.87E-04	582	5.99E-04	649	2.11E-04	716	3.13E-05
382	2.70E-06	449	9.61E-04	516	3.96E-04	583	5.95E-04	650	2.06E-04	717	3.04E-05
383	4.90E-06	450	9.88E-04	517	4.06E-04	584	5.96E-04	651	2.02E-04	718	2.91E-05
384	3.60E-06	451	9.96E-04	518	4.12E-04	585	5.92E-04	652	1.96E-04	719	2.87E-05
385	3.10E-06	452	9.86E-04	519	4.20E-04	586	5.88E-04	653	1.91E-04	720	2.76E-05
386	3.20E-06	453	9.53E-04	520	4.30E-04	587	5.85E-04	654	1.87E-04	721	2.68E-05
387	2.50E-06	454	9.06E-04	521	4.36E-04	588	5.83E-04	655	1.81E-04	722	2.60E-05
388	2.80E-06	455	8.48E-04	522	4.43E-04	589	5.80E-04	656	1.77E-04	723	2.52E-05
389	2.90E-06	456	7.85E-04	523	4.51E-04	590	5.76E-04	657	1.72E-04	724	2.45E-05
390	3.00E-06	457	7.17E-04	524	4.57E-04	591	5.74E-04	658	1.67E-04	725	2.38E-05
391	3.60E-06	458	6.54E-04	525	4.64E-04	592	5.67E-04	659	1.63E-04	726	2.29E-05
392	3.80E-06	459	5.97E-04	526	4.67E-04	593	5.64E-04	660	1.58E-04	727	2.23E-05
393	4.20E-06	460	5.51E-04	527	4.74E-04	594	5.60E-04	661	1.54E-04	728	2.18E-05
394	4.10E-06	461	5.08E-04	528	4.78E-04	595	5.56E-04	662	1.50E-04	729	2.11E-05
395	4.30E-06	462	4.78E-04	529	4.82E-04	596	5.54E-04	663	1.45E-04	730	2.06E-05
396	4.30E-06	463	4.47E-04	530	4.86E-04	597	5.48E-04	664	1.42E-04	731	1.99E-05
397	4.00E-06	464	4.23E-04	531	4.89E-04	598	5.44E-04	665	1.38E-04	732	1.92E-05
398	4.90E-06	465	3.96E-04	532	4.94E-04	599	5.40E-04	666	1.34E-04	733	1.86E-05
399	5.00E-06	466	3.76E-04	533	4.96E-04	600	5.38E-04	667	1.30E-04	734	1.81E-05
400	4.90E-06	467	3.54E-04	534	5.02E-04	601	5.31E-04	668	1.27E-04	735	1.77E-05
401	5.80E-06	468	3.32E-04	535	5.04E-04	602	5.27E-04	669	1.24E-04	736	1.69E-05
402	6.30E-06	469	3.08E-04	536	5.07E-04	603	5.21E-04	670	1.20E-04	737	1.66E-05
403	6.80E-06	470	2.87E-04	537	5.10E-04	604	5.15E-04	671	1.16E-04	738	1.63E-05
404	7.80E-06	471	2.55E-04	538	5.14E-04	605	5.09E-04	672	1.13E-04	739	1.55E-05
405	8.60E-06	472	2.37E-04	539	5.18E-04	606	5.03E-04	673	1.10E-04	740	1.52E-05
406	9.40E-06	473	2.19E-04	540	5.21E-04	607	4.97E-04	674	1.07E-04	741	1.48E-05
407	1.09E-05	474	2.04E-04	541	5.22E-04	608	4.90E-04	675	1.04E-04	742	1.44E-05
408	1.18E-05	475	1.89E-04	542	5.27E-04	609	4.85E-04	676	1.01E-04	743	1.39E-05
409	1.34E-05	476	1.77E-04	543	5.30E-04	610	4.78E-04	677	9.80E-05	744	1.33E-05
410	1.54E-05	477	1.68E-04	544	5.32E-04	611	4.72E-04	678	9.53E-05	745	1.33E-05
411	1.78E-05	478	1.60E-04	545	5.36E-04	612	4.66E-04	679	9.23E-05	746	1.28E-05
412	2.03E-05	479	1.53E-04	546	5.39E-04	613	4.60E-04	680	8.99E-05	747	1.23E-05
413	2.33E-05	480	1.49E-04	547	5.43E-04	614	4.51E-04	681	8.76E-05	748	1.18E-05
414	2.65E-05	481	1.46E-04	548	5.47E-04	615	4.43E-04	682	8.50E-05	749	1.17E-05
415	2.96E-05	482	1.43E-04	549	5.48E-04	616	4.37E-04	683	8.23E-05	750	1.12E-05
416	3.47E-05	483	1.40E-04	550	5.50E-04	617	4.29E-04	684	8.04E-05	751	1.10E-05
417	3.90E-05	484	1.39E-04	551	5.53E-04	618	4.21E-04	685	7.77E-05	752	1.06E-05
418	4.41E-05	485	1.39E-04	552	5.55E-04	619	4.13E-04	686	7.54E-05	753	1.05E-05
419	4.99E-05	486	1.39E-04	553	5.59E-04	620	4.07E-04	687	7.36E-05	754	1.01E-05
420	5.56E-05	487	1.41E-04	554	5.62E-04	621	3.98E-04	688	7.12E-05	755	9.70E-06
421	6.36E-05	488	1.42E-04	555	5.67E-04	622	3.93E-04	689	6.93E-05	756	9.50E-06
422	7.23E-05	489	1.44E-04	556	5.69E-04	623	3.84E-04	690	6.71E-05	757	9.10E-06
423	8.11E-05	490	1.46E-04	557	5.69E-04	624	3.78E-04	691	6.52E-05	758	8.70E-06
424	9.06E-05	491	1.49E-04	558	5.71E-04	625	3.70E-04	692	6.34E-05	759	8.90E-06
425	1.00E-04	492	1.56E-04	559	5.76E-04	626	3.61E-04	693	6.16E-05	760	8.50E-06
426	1.12E-04	493	1.61E-04	560	5.79E-04	627	3.56E-04	694	5.97E-05	761	8.20E-06
427	1.27E-04	494	1.68E-04	561	5.78E-04	628	3.50E-04	695	5.80E-05	762	7.80E-06
428	1.44E-04	495	1.76E-04	562	5.82E-04	629	3.42E-04	696	5.64E-05	763	7.70E-06
429	1.61E-04	496	1.84E-04	563	5.86E-04	630	3.35E-04	697	5.46E-05	764	7.30E-06
430	1.77E-04	497	1.94E-04	564	5.85E-04	631	3.27E-04	698	5.32E-05	765	7.10E-06
431	1.97E-04	498	2.04E-04	565	5.89E-04	632	3.21E-04	699	5.16E-05	766	7.10E-06
432	2.18E-04	499	2.14E-04	566	5.89E-04	633	3.13E-04	700	5.02E-05	767	7.00E-06
433	2.43E-04	500	2.25E-04	567	5.92E-04	634	3.06E-04	701	4.84E-05	768	6.70E-06
434	2.63E-04	501	2.35E-04	568	5.95E-04	635	2.99E-04	702	4.70E-05	769	6.30E-06
435	2.94E-04	502	2.46E-04	569	5.96E-04	636	2.94E-04	703	4.56E-05	770	6.10E-06
436	3.20E-04	503	2.58E-04	570	5.98E-04	637	2.86E-04	704	4.46E-05	771	6.00E-06
437	3.52E-04	504	2.69E-04	571	5.97E-04	638	2.79E-04	705	4.32E-05	772	5.90E-06
438	3.85E-04	505	2.80E-04	572	5.98E-04	639	2.73E-04	706	4.18E-05	773	5.90E-06
439	4.22E-04	506	2.92E-04	573	5.98E-04	640	2.67E-04	707	4.09E-05	774	5.50E-06
440	4.64E-04	507	3.03E-04	574	6.00E-04	641	2.59E-04	708	3.96E-05	775	5.40E-06
441	5.08E-04	508	3.16E-04	575	6.01E-04	642	2.52E-04	709	3.82E-05	776	5.30E-06
442	5.65E-04	509	3.26E-04	576	5.99E-04	643	2.46E-04	710	3.72E-05	777	5.20E-06
443	6.16E-04	510	3.37E-04	577	6.01E-04	644	2.41E-04	711	3.61E-05	778	5.00E-06
444	6.73E-04	511	3.46E-04	578	6.00E-04	645	2.35E-04	712	3.51E-05	779	5.00E-06
445	7.38E-04	512	3.58E-04	579	6.01E-04	646	2.29E-04	713	3.38E-05	780	5.00E-06
446	8.07E-04	513	3.69E-04	580	6.00E-04	647	2.23E-04	714	3.32E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34S @ 35W / 5000K	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	0.325	38.8	0.995
NON-WORST CASE	277.0	60	0.151	38.5	0.923

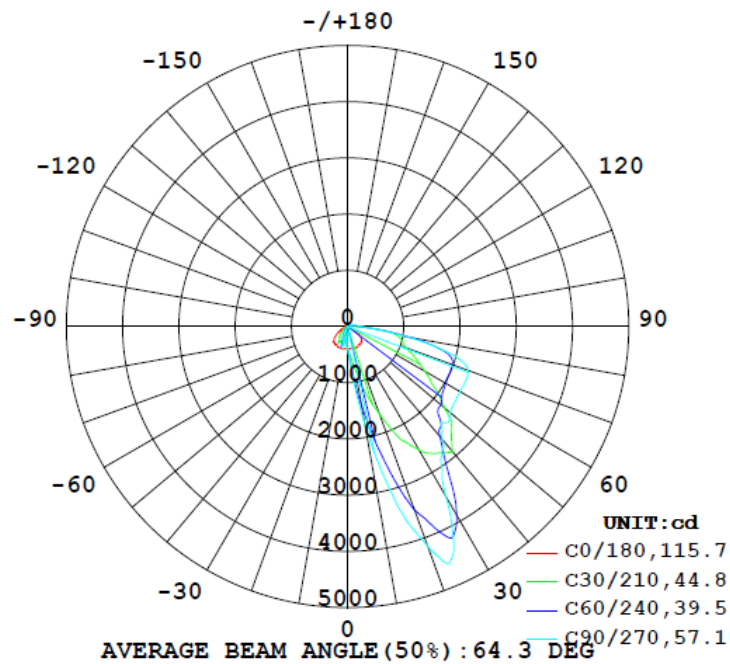
Test Result

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	5453	83.6	131.3	54.0	78.7	140.5	4.4%	B0-U3-G3
0°-90° zones	5302	83.6	131.3	54.0	78.7	136.6	4.6%	B0-U3-G3

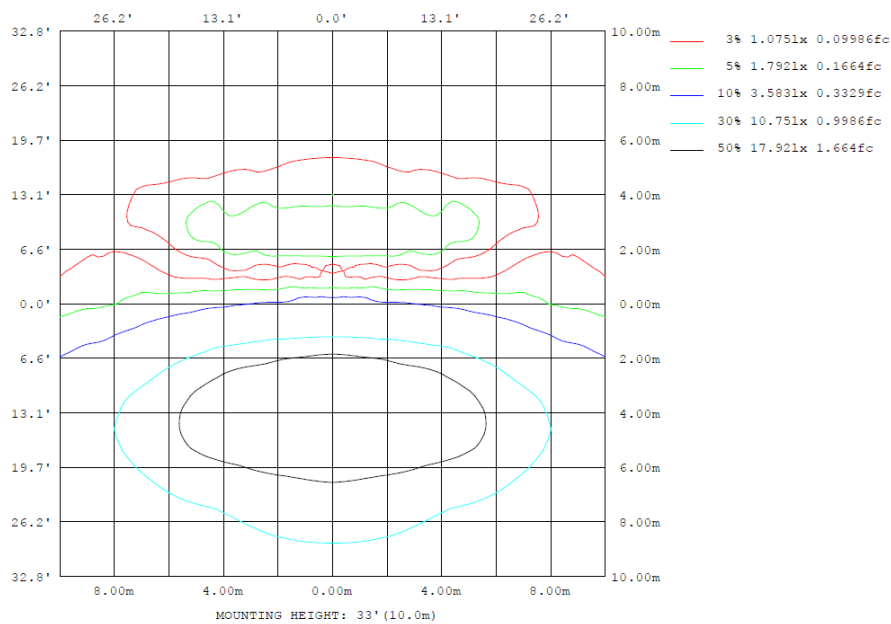
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

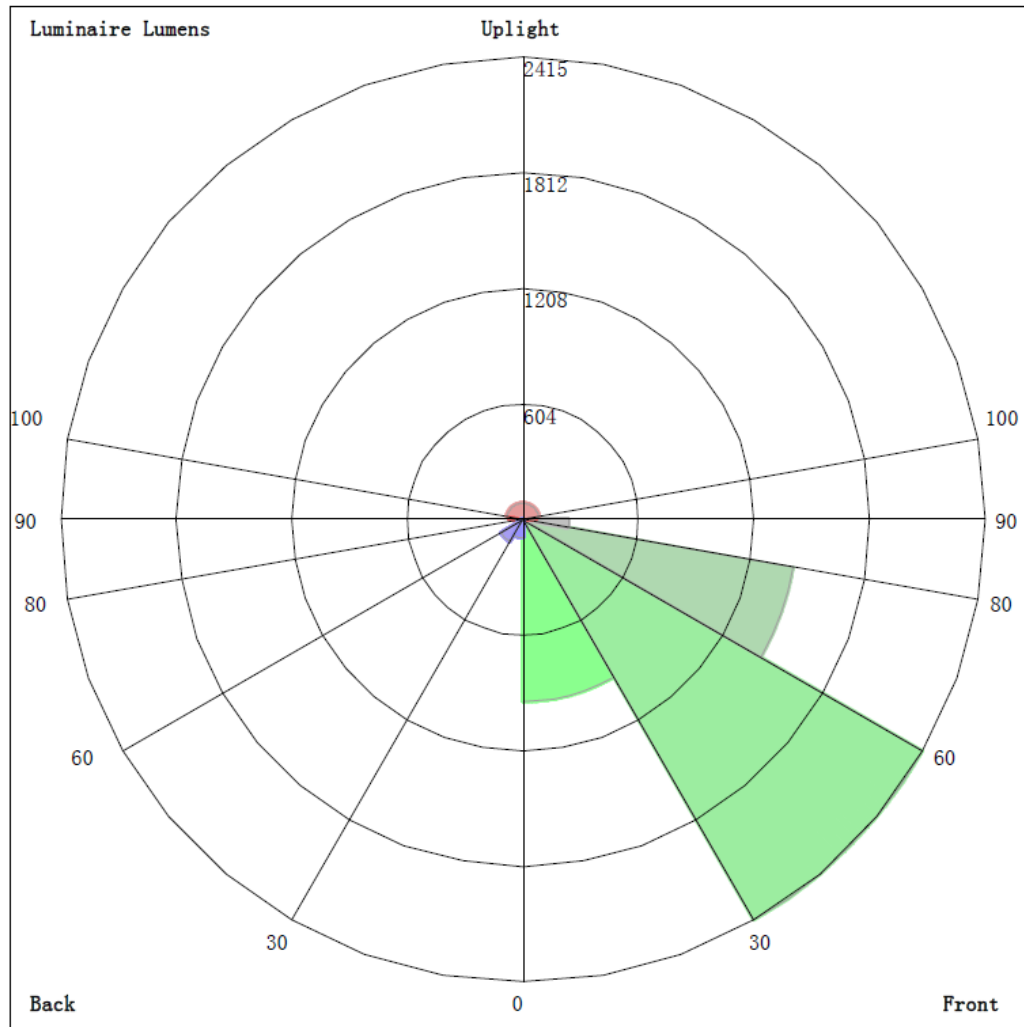
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	399.8	1117	1761	1117	399.8	95.11	196.7	95.11	0- 10	46.52	46.52	0.85,0.85
20	409.3	2549	4154	2549	409.3	322.4	213.4	322.4	10- 20	297.8	344.3	6.31,6.31
30	386.2	3775	3504	3775	386.2	234.2	114.2	234.2	20- 30	701.9	1046	19.2,19.2
40	370.6	3120	2628	3120	370.6	123.6	39.40	123.6	30- 40	853.1	1899	34.8,34.8
50	305.2	2151	2383	2151	305.2	55.76	5.463	55.76	40- 50	861.8	2761	50.6,50.6
60	178.7	1845	2305	1845	178.7	19.15	1.498	19.15	50- 60	834.2	3595	65.9,65.9
70	92.83	1738	2278	1738	92.83	10.97	0.3175	10.97	60- 70	798.1	4393	80.6,80.6
80	29.45	1252	1085	1252	29.45	7.275	0.8405	7.275	70- 80	665.9	5059	92.8,92.8
90	9.955	218.6	233.4	218.6	9.955	4.130	1.515	4.130	80- 90	242.5	5302	97.2,97.2
100	6.550	98.33	153.5	98.33	6.550	2.935	1.973	2.935	90-100	67.37	5369	98.5,98.5
110	5.277	42.96	67.26	42.96	5.277	2.792	2.088	2.792	100-110	34.14	5403	99.1,99.1
120	3.862	37.35	48.81	37.35	3.862	2.749	2.071	2.749	110-120	19.62	5423	99.4,99.4
130	3.202	25.25	41.04	25.25	3.202	2.825	2.441	2.825	120-130	14.08	5437	99.7,99.7
140	2.552	14.37	24.75	14.37	2.552	2.599	2.635	2.599	130-140	9.515	5447	99.9,99.9
150	1.955	8.794	14.22	8.794	1.955	2.248	2.441	2.248	140-150	4.266	5451	100,100
160	1.533	3.923	6.858	3.923	1.533	2.043	1.882	2.043	150-160	1.918	5453	100,100
170	1.314	0.9672	0.7950	0.9672	1.314	1.582	1.072	1.582	160-170	0.5916	5453	100,100
180	1.481	1.327	1.230	1.327	1.481	1.395	1.188	1.395	170-180	0.1165	5453	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

0-10	46.52	0-10	46.52	0.85%
10-20	297.76	0-20	344.28	6.31%
20-30	701.91	0-30	1046.19	19.18%
30-40	853.10	0-40	1899.29	34.83%
40-50	861.80	0-50	2761.09	50.63%
50-60	834.24	0-60	3595.33	65.93%
60-70	798.12	0-70	4393.45	80.56%
70-80	665.88	0-80	5059.33	92.77%
80-90	242.51	0-90	5301.84	97.22%
90-100	67.37	0-100	5369.21	98.46%
100-110	34.14	0-110	5403.35	99.08%
110-120	19.62	0-120	5422.97	99.44%
120-130	14.08	0-130	5437.05	99.70%
130-140	9.52	0-140	5446.57	99.88%
140-150	4.27	0-150	5450.84	99.95%
150-160	1.92	0-160	5452.76	99.99%
160-170	0.59	0-170	5453.35	100.00%
170-180	0.12	0-180	5453.47	100.00%

4.2 Goniophotometer Test

LCS/BUG

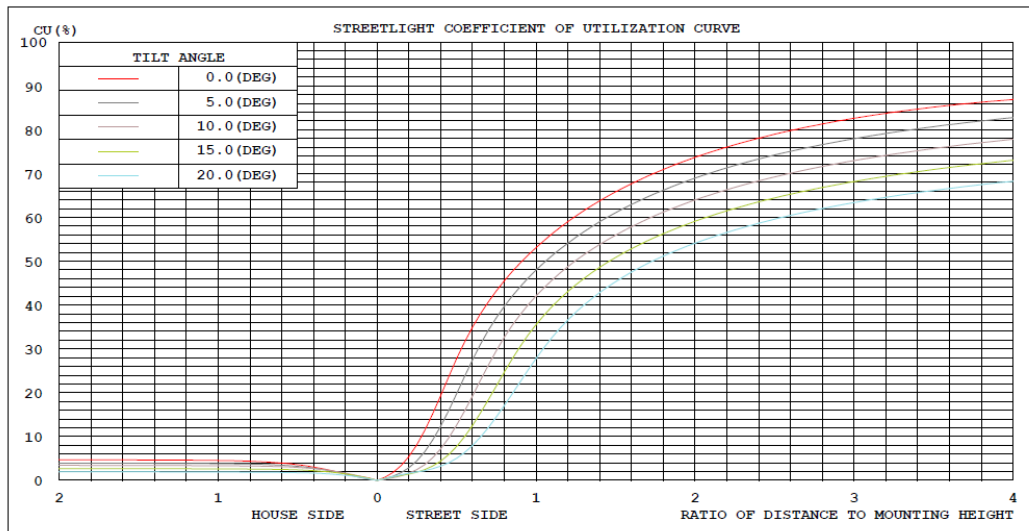


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

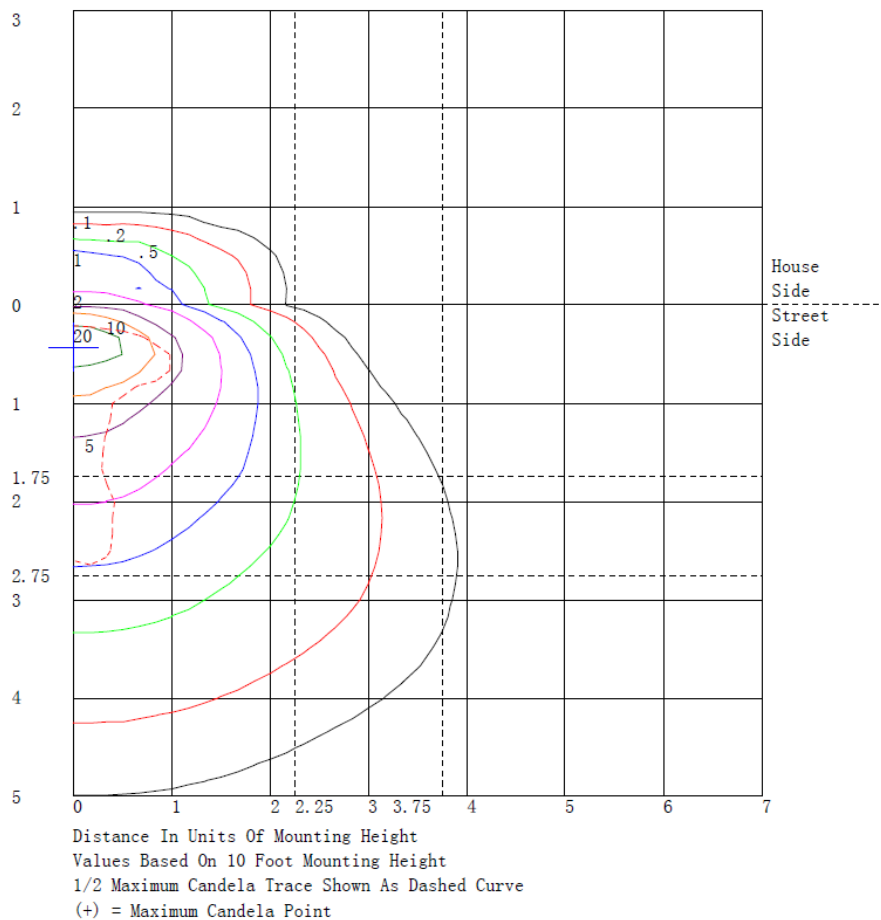
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	951.4	N.A.	17.4
FM - Front-Medium (30-60)	2415.5	N.A.	44.3
FH - Front-High (60-80)	1434.9	N.A.	26.3
FVH - Front-Very High (80-90)	238.3	N.A.	4.4
BL - Back-Low (0-30)	94.8	N.A.	1.7
BM - Back-Medium (30-60)	133.6	N.A.	2.5
BH - Back-High (60-80)	29.1	N.A.	0.5
BVH - Back-Very High (80-90)	4.2	N.A.	0.1
UL - Uplight-Low (90-100)	67.4	N.A.	1.2
UH - Uplight-High (100-180)	84.3	N.A.	1.5
Total	5453.5	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)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
γ (DEG)	0	397	397	397	398	398	399	399	399	400	400	401	401	401	402	402	402	403	403
5	400	410	425	443	466	492	520	544	569	593	621	648	675	699	721	739	754	764	768
10	400	433	478	534	601	680	771	882	999	1117	1225	1327	1422	1510	1587	1653	1706	1742	1761
15	415	463	544	658	816	999	1199	1402	1609	1817	2021	2219	2407	2585	2745	2885	3006	3092	3135
20	409	518	666	853	1091	1359	1648	1941	2243	2549	2876	3185	3459	3637	3773	3880	4006	4101	4154
25	411	566	778	1047	1404	1795	2199	2571	2928	3265	3587	3870	4101	4229	4307	4353	4403	4435	4449
30	386	589	853	1179	1599	2056	2526	3005	3434	3775	3903	3930	3883	3790	3675	3563	3519	3500	3504
35	399	589	860	1211	1713	2244	2753	3157	3459	3632	3522	3319	3089	2992	2928	2891	2876	2875	2882
40	371	566	852	1228	1805	2389	2896	3098	3165	3120	2949	2744	2558	2550	2587	2641	2642	2636	2628
45	348	638	962	1321	1796	2243	2600	2656	2608	2502	2437	2373	2321	2313	2323	2343	2373	2400	2419
50	305	596	901	1219	1611	1971	2251	2282	2233	2151	2140	2143	2163	2220	2283	2343	2368	2381	2383
55	240	562	865	1149	1437	1689	1884	1947	1962	1954	1981	2015	2058	2131	2207	2275	2309	2327	2329
60	179	476	749	996	1222	1420	1585	1696	1780	1845	1904	1960	2017	2105	2190	2263	2295	2308	2305
65	134	353	564	768	965	1153	1331	1502	1655	1787	1869	1936	1998	2096	2190	2269	2303	2315	2310
70	92.8	206	341	500	690	896	1111	1338	1552	1738	1841	1917	1979	2077	2167	2241	2273	2284	2278
75	56.9	109	203	339	538	764	1003	1240	1458	1641	1734	1790	1823	1868	1902	1926	1930	1925	1915
80	29.5	55.8	129	249	449	671	888	1049	1172	1252	1246	1207	1156	1138	1124	1113	1100	1091	1085
85	18.6	49.5	99.8	170	281	396	496	534	547	540	516	486	457	450	448	449	446	443	442
90	9.95	18.7	33.9	55.6	88.9	125	160	186	205	219	218	212	207	213	220	227	231	233	233
95	7.33	11.0	18.5	29.9	46.5	66.0	87.4	112	134	153	159	161	162	171	180	188	193	195	196
100	6.55	10.6	15.8	22.1	28.9	37.4	48.0	64.6	82.0	98.3	108	115	122	131	140	147	151	153	153
105	6.38	9.72	13.7	18.4	24.0	30.0	36.4	42.4	48.6	55.4	63.5	72.0	80.8	90.5	99.4	107	110	112	112
110	5.28	7.66	10.9	15.0	20.8	26.8	32.6	36.3	39.6	43.0	47.7	52.6	57.2	61.0	64.1	66.4	67.3	67.4	67.3
115	4.39	6.32	9.13	12.8	18.2	23.8	29.2	32.4	35.1	37.7	41.0	44.5	47.9	51.5	54.6	57.0	57.3	57.0	56.5
120	3.86	5.66	7.91	10.6	13.8	17.4	21.5	27.0	32.5	37.3	39.5	40.8	41.9	44.4	46.7	48.7	49.1	49.1	48.8
125	3.54	4.58	6.18	8.34	10.9	14.1	18.2	24.4	30.7	36.3	38.6	39.9	40.5	41.7	42.6	43.2	43.0	42.6	42.2
130	3.20	3.64	4.73	6.45	9.05	12.1	15.4	18.3	21.4	25.3	31.6	37.9	43.1	44.0	43.5	42.3	41.8	41.3	41.0
135	2.85	2.92	3.63	4.97	7.37	10.1	12.8	14.4	16.0	18.0	20.8	24.5	29.1	35.9	42.9	49.3	52.9	55.1	55.8
140	2.55	2.37	2.76	3.73	5.63	7.84	10.1	11.6	13.0	14.4	16.1	17.9	19.7	21.4	22.8	24.0	24.5	24.8	24.8
145	2.25	1.62	1.60	2.19	3.75	5.65	7.61	8.88	10.0	11.2	12.6	14.0	15.4	16.5	17.5	18.2	18.4	18.4	18.3
150	1.96	1.36	1.23	1.58	2.62	3.95	5.41	6.58	7.71	8.79	9.86	10.9	11.8	12.6	13.3	13.9	14.1	14.2	14.2
155	1.70	1.36	1.27	1.43	1.90	2.57	3.42	4.46	5.54	6.60	7.44	8.16	8.75	9.18	9.49	9.68	9.74	9.73	9.68
160	1.53	1.46	1.42	1.41	1.32	1.34	1.53	2.21	3.05	3.92	4.62	5.24	5.78	6.23	6.58	6.82	6.90	6.90	6.86
165	1.38	1.37	1.35	1.32	1.26	1.21	1.19	1.18	1.24	1.38	1.76	2.20	2.65	2.99	3.28	3.51	3.65	3.74	3.78
170	1.31	1.29	1.27	1.23	1.20	1.15	1.11	1.06	1.01	0.97	0.92	0.88	0.84	0.82	0.79	0.78	0.77	0.77	0.79
175	1.38	1.36	1.35	1.33	1.31	1.28	1.26	1.23	1.19	1.16	1.13	1.09	1.06	1.03	1.00	0.99	0.97	0.97	0.99
180	1.48	1.48	1.47	1.46	1.45	1.43	1.41	1.38	1.36	1.33	1.30	1.27	1.24	1.22	1.20	1.19	1.20	1.21	1.23

																			UNIT: cd		
γ	C (DEG)																				
	(DEG)		95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
	0	403	402	402	402	402	401	401	401	400	400	399	399	399	399	398	398	397	397	397	400
	5	764	754	739	721	699	675	648	621	593	569	544	520	492	466	443	425	410	400	403	
	10	1742	1706	1653	1587	1510	1422	1327	1225	1117	999	882	771	680	601	534	478	433	400	334	
	15	3092	3006	2885	2745	2585	2407	2219	2021	1817	1609	1402	1199	999	816	658	544	463	415	301	
	20	4101	4006	3880	3773	3637	3459	3185	2876	2549	2243	1941	1648	1359	1091	853	666	518	409	275	
	25	4435	4403	4353	4307	4229	4101	3870	3587	3265	2928	2571	2199	1795	1404	1047	778	566	411	258	
	30	3500	3519	3563	3675	3790	3883	3930	3903	3775	3434	3005	2526	2056	1599	1179	853	589	386	244	
	35	2875	2876	2891	2928	2992	3089	3319	3522	3632	3459	3157	2753	2244	1713	1211	860	589	399	292	
	40	2636	2642	2641	2587	2550	2558	2744	2949	3120	3165	3098	2896	2389	1805	1228	852	566	371	306	
	45	2400	2373	2343	2323	2313	2321	2373	2437	2502	2608	2656	2600	2243	1796	1321	962	638	348	311	
	50	2381	2368	2343	2283	2220	2163	2143	2140	2151	2233	2282	2251	1971	1611	1219	901	596	305	283	
	55	2327	2309	2275	2207	2131	2058	2015	1981	1954	1962	1947	1884	1689	1437	1149	865	562	240	223	
	60	2308	2295	2263	2190	2105	2017	1960	1904	1845	1780	1696	1585	1420	1222	996	749	476	179	184	
	65	2315	2303	2269	2190	2096	1998	1936	1869	1787	1655	1502	1331	1153	965	768	564	353	134	138	
	70	2284	2273	2241	2167	2077	1979	1917	1841	1738	1552	1338	1111	896	690	500	341	206	92.8	86.7	
	75	1925	1930	1926	1902	1868	1823	1790	1734	1641	1458	1240	1003	764	538	339	203	109	56.9	51.2	
	80	1091	1100	1113	1124	1138	1156	1207	1246	1252	1172	1049	888	671	449	249	129	55.8	29.5	28.2	
	85	443	446	449	448	450	457	486	516	540	547	534	496	396	281	170	99.8	49.5	18.6	19.2	
	90	233	231	227	220	213	207	212	218	219	205	186	160	125	88.9	55.6	33.9	18.7	9.95	9.50	
	95	195	193	188	180	171	162	161	159	153	134	112	87.4	66.0	46.5	29.9	18.5	11.0	7.33	7.39	
	100	153	151	147	140	131	122	115	108	98.3	82.0	64.6	48.0	37.4	28.9	22.1	15.8	10.6	6.55	6.28	
	105	112	110	107	99.4	90.5	80.8	72.0	63.5	55.4	48.6	42.4	36.4	30.0	24.0	18.4	13.7	9.72	6.38	6.21	
	110	67.4	67.3	66.4	64.1	61.0	57.2	52.6	47.7	43.0	39.6	36.3	32.6	26.8	20.8	15.0	10.9	7.66	5.28	5.67	
	115	57.0	57.3	57.0	54.6	51.5	47.9	44.5	41.0	37.7	35.1	32.4	29.2	23.8	18.2	12.8	9.13	6.32	4.39	5.48	
	120	49.1	49.1	48.7	46.7	44.4	41.9	40.8	39.5	37.3	32.5	27.0	21.5	17.4	13.8	10.6	7.91	5.66	3.86	5.46	
	125	42.6	43.0	43.2	42.6	41.7	40.5	39.9	38.6	36.3	30.7	24.4	18.2	14.1	10.9	8.34	6.18	4.58	3.54	4.95	
	130	41.3	41.8	42.3	43.5	44.0	43.1	37.9	31.6	25.3	21.4	18.3	15.4	12.1	9.05	6.45	4.73	3.64	3.20	3.77	
	135	55.1	52.9	49.3	42.9	35.9	29.1	24.5	20.8	18.0	16.0	14.4	12.8	10.1	7.37	4.97	3.63	2.92	2.85	3.18	
	140	24.8	24.5	24.0	22.8	21.4	19.7	17.9	16.1	14.4	13.0	11.6	10.1	7.84	5.63	3.73	2.76	2.37	2.55	2.82	
	145	18.4	18.4	18.2	17.5	16.5	15.4	14.0	12.6	11.2	10.0	8.88	7.61	5.65	3.75	2.19	1.60	1.62	2.25	2.45	
	150	14.2	14.1	13.9	13.3	12.6	11.8	10.9	9.86	8.79	7.71	6.58	5.41	3.95	2.62	1.58	1.23	1.36	1.96	2.20	
	155	9.73	9.74	9.68	9.49	9.18	8.75	8.16	7.44	6.60	5.54	4.46	3.42	2.57	1.90	1.43	1.27	1.36	1.70	1.98	
	160	6.90	6.90	6.82	6.58	6.23	5.78	5.24	4.62	3.92	3.05	2.21	1.53	1.34	1.32	1.41	1.42	1.46	1.53	1.81	
	165	3.74	3.65	3.51	3.28	2.99	2.65	2.20	1.76	1.38	1.24	1.18	1.19	1.21	1.26	1.32	1.35	1.37	1.38	1.61	
	170	0.77	0.77	0.78	0.79	0.82	0.84	0.88	0.92	0.97	1.01	1.06	1.11	1.15	1.20	1.23	1.27	1.29	1.31	1.45	
	175	0.97	0.97	0.99	1.00	1.03	1.06	1.09	1.13	1.16	1.19	1.23	1.26	1.28	1.31	1.33	1.35	1.36	1.38	1.45	
	180	1.21	1.20	1.19	1.20	1.22	1.24	1.27	1.30	1.33	1.36	1.38	1.41	1.43	1.45	1.46	1.47	1.48	1.48	1.41	

Table--3

UNIT: °C

C (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	403	404	405	405	405	405	406	406	406	405	405	405	405	405	404	404	403	404	404
5	397	390	350	312	270	226	184	150	136	130	129	126	124	123	121	120	120	120	121
10	275	225	183	148	122	106	97.3	95.1	98.5	107	120	138	158	176	187	194	197	194	187
15	211	146	108	94.3	102	139	187	238	271	298	317	321	320	319	328	337	342	337	328
20	181	126	128	159	205	250	292	322	315	294	267	248	231	218	213	212	213	212	213
25	157	110	150	217	286	284	267	244	239	234	228	212	195	180	174	171	171	171	174
30	157	123	184	269	347	328	286	234	205	179	159	146	137	130	123	117	114	117	123
35	218	175	186	214	242	228	203	173	147	124	104	93.8	88.3	85.6	82.5	80.7	80.3	80.7	82.5
40	258	227	227	233	237	204	164	124	101	83.2	69.8	57.9	48.9	42.7	39.9	39.0	39.4	39.0	39.9
45	278	248	224	201	178	150	121	95.1	74.7	57.8	44.3	34.9	28.1	23.5	19.4	16.8	15.7	16.8	19.4
50	258	229	195	161	127	100.0	76.0	55.8	39.9	27.5	18.4	12.5	8.84	6.92	5.69	5.29	5.46	5.29	5.69
55	203	181	154	125	96.6	70.2	46.8	27.8	18.2	12.7	9.94	6.76	4.64	3.39	2.80	2.68	2.86	2.68	2.80
60	179	164	131	92.6	56.4	38.4	26.5	19.1	13.3	9.59	7.29	4.81	3.00	1.80	1.36	1.31	1.50	1.31	1.36
65	134	121	93.1	61.9	33.1	22.0	16.5	14.3	10.4	7.51	5.28	3.28	1.77	0.75	0.40	0.37	0.54	0.37	0.40
70	78.5	68.2	53.3	38.2	24.6	17.9	13.6	11.0	8.04	5.73	3.92	2.34	1.14	0.33	0.11	0.14	0.32	0.14	0.11
75	45.2	38.8	31.2	23.8	17.3	13.4	10.6	8.49	6.44	4.75	3.36	2.14	1.19	0.54	0.36	0.40	0.53	0.40	0.36
80	26.4	24.0	20.4	16.5	12.9	10.6	8.80	7.27	5.72	4.34	3.15	2.16	1.38	0.84	0.70	0.73	0.84	0.73	0.70
85	18.9	17.8	15.2	12.3	9.40	7.89	6.76	5.84	4.73	3.71	2.80	2.09	1.54	1.17	1.07	1.09	1.17	1.09	1.07
90	8.94	8.28	7.43	6.55	5.71	5.13	4.62	4.13	3.50	2.89	2.35	1.96	1.68	1.50	1.45	1.47	1.52	1.47	1.45
95	7.23	6.87	6.16	5.35	4.55	4.03	3.59	3.21	2.78	2.40	2.08	1.91	1.80	1.75	1.74	1.76	1.78	1.76	1.74
100	5.95	5.57	5.09	4.60	4.10	3.68	3.29	2.94	2.60	2.31	2.09	1.98	1.94	1.93	1.94	1.95	1.97	1.95	1.94
105	5.93	5.55	4.97	4.36	3.78	3.41	3.12	2.87	2.59	2.35	2.15	2.08	2.05	2.05	2.06	2.08	2.10	2.08	2.06
110	5.79	5.64	5.04	4.31	3.58	3.23	2.98	2.79	2.54	2.32	2.15	2.08	2.05	2.06	2.06	2.08	2.09	2.08	2.06
115	6.08	6.17	5.44	4.45	3.45	3.10	2.89	2.77	2.54	2.33	2.15	2.08	2.06	2.06	2.06	2.06	2.07	2.06	2.06
120	6.38	6.62	5.76	4.55	3.32	2.96	2.80	2.75	2.54	2.35	2.19	2.12	2.09	2.08	2.07	2.07	2.07	2.07	2.07
125	5.79	6.05	5.37	4.37	3.35	3.02	2.87	2.79	2.62	2.46	2.33	2.27	2.25	2.24	2.23	2.22	2.21	2.22	2.23
130	4.11	4.24	4.02	3.68	3.30	3.11	2.95	2.82	2.69	2.57	2.49	2.46	2.46	2.47	2.46	2.45	2.44	2.45	2.46
135	3.40	3.51	3.45	3.32	3.15	3.01	2.88	2.75	2.66	2.59	2.54	2.54	2.57	2.59	2.60	2.60	2.60	2.60	2.60
140	3.02	3.14	3.16	3.12	3.03	2.89	2.74	2.60	2.53	2.50	2.50	2.52	2.56	2.61	2.63	2.64	2.63	2.64	2.63
145	2.59	2.67	2.67	2.62	2.56	2.50	2.45	2.40	2.38	2.38	2.40	2.44	2.49	2.54	2.56	2.58	2.58	2.58	2.56
150	2.37	2.47	2.46	2.41	2.34	2.30	2.27	2.25	2.26	2.28	2.31	2.34	2.38	2.41	2.43	2.44	2.44	2.44	2.43
155	2.18	2.29	2.29	2.23	2.16	2.13	2.11	2.10	2.12	2.14	2.16	2.17	2.18	2.19	2.19	2.19	2.17	2.19	2.19
160	2.01	2.13	2.13	2.08	2.02	2.02	2.03	2.04	2.05	2.05	2.04	2.03	2.01	1.99	1.96	1.92	1.88	1.92	1.96
165	1.78	1.88	1.90	1.88	1.85	1.86	1.88	1.89	1.87	1.85	1.81	1.76	1.71	1.65	1.60	1.56	1.52	1.56	1.60
170	1.54	1.61	1.62	1.61	1.59	1.59	1.58	1.53	1.46	1.38	1.29	1.20	1.13	1.09	1.07	1.07	1.07	1.07	1.09
175	1.50	1.54	1.54	1.54	1.52	1.51	1.49	1.46	1.39	1.32	1.24	1.19	1.14	1.11	1.10	1.11	1.12	1.11	1.10
180	1.40	1.37	1.37	1.37	1.37	1.38	1.39	1.40	1.38	1.36	1.33	1.29	1.26	1.22	1.20	1.19	1.19	1.19	1.20

																UNIT: °C				
γ	C (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
	(DEG)																			
0		405	405	405	405	405	406	406	406	405	405	405	405	404	403	400				
5		123	124	126	129	130	136	150	184	226	270	312	350	380	397	403				
10		176	158	138	120	107	98.5	95.1	97.3	106	122	148	183	225	275	334				
15		319	320	321	317	298	271	238	187	139	102	94.3	108	146	211	301				
20		218	231	248	267	294	315	322	292	250	205	159	128	126	181	275				
25		180	195	212	228	234	239	244	267	284	286	217	150	110	157	258				
30		130	137	146	159	179	205	234	286	328	347	269	184	123	157	244				
35		85.6	88.3	93.8	104	124	147	173	203	228	242	214	186	175	218	292				
40		42.7	48.9	57.9	69.8	83.2	101	124	164	204	237	233	227	227	258	306				
45		23.5	28.1	34.9	44.3	57.8	74.7	95.1	121	150	178	201	224	248	278	311				
50		6.92	8.84	12.5	18.4	27.5	39.9	55.8	76.0	100.0	127	161	195	229	258	283				
55		3.39	4.64	6.76	9.94	12.7	18.2	27.8	46.8	70.2	96.6	125	154	181	203	223				
60		1.80	3.00	4.81	7.29	9.59	13.3	19.1	26.5	38.4	56.4	92.6	131	164	179	184				
65		0.75	1.77	3.28	5.28	7.51	10.4	14.3	16.5	22.0	33.1	61.9	93.1	121	134	138				
70		0.33	1.14	2.34	3.92	5.73	8.04	11.0	13.6	17.9	24.6	38.2	53.3	68.2	78.5	86.7				
75		0.54	1.19	2.14	3.36	4.75	6.44	8.49	10.6	13.4	17.3	23.8	31.2	38.8	45.2	51.2				
80		0.84	1.38	2.16	3.15	4.34	5.72	7.27	8.80	10.6	12.9	16.5	20.4	24.0	26.4	28.2				
85		1.17	1.54	2.09	2.80	3.71	4.73	5.84	6.76	7.89	9.40	12.3	15.2	17.8	18.9	19.2				
90		1.50	1.68	1.96	2.35	2.89	3.50	4.13	4.62	5.13	5.71	6.55	7.43	8.28	8.94	9.50				
95		1.75	1.80	1.91	2.08	2.40	2.78	3.21	3.59	4.03	4.55	5.35	6.16	6.87	7.23	7.39				
100		1.93	1.94	1.98	2.09	2.31	2.60	2.94	3.29	3.68	4.10	4.60	5.09	5.57	5.95	6.28				
105		2.05	2.05	2.08	2.15	2.35	2.59	2.87	3.12	3.41	3.78	4.36	4.97	5.55	5.93	6.21				
110		2.06	2.05	2.08	2.15	2.32	2.54	2.79	2.98	3.23	3.58	4.31	5.04	5.64	5.79	5.67				
115		2.06	2.06	2.08	2.15	2.33	2.54	2.77	2.89	3.10	3.45	4.45	5.44	6.17	6.08	5.48				
120		2.08	2.09	2.12	2.19	2.35	2.54	2.75	2.80	2.96	3.32	4.55	5.76	6.62	6.38	5.46				
125		2.24	2.25	2.27	2.33	2.46	2.62	2.79	2.87	3.02	3.35	4.37	5.37	6.05	5.79	4.95				
130		2.47	2.46	2.46	2.49	2.57	2.69	2.82	2.95	3.11	3.30	3.68	4.02	4.24	4.11	3.77				
135		2.59	2.57	2.54	2.54	2.59	2.66	2.75	2.88	3.01	3.15	3.32	3.45	3.51	3.40	3.18				
140		2.61	2.56	2.52	2.50	2.50	2.53	2.60	2.74	2.89	3.03	3.12	3.16	3.14	3.02	2.82				
145		2.54	2.49	2.44	2.40	2.38	2.38	2.40	2.45	2.50	2.56	2.62	2.67	2.67	2.59	2.45				
150		2.41	2.38	2.34	2.31	2.28	2.26	2.25	2.27	2.30	2.34	2.41	2.46	2.47	2.37	2.20				
155		2.19	2.18	2.17	2.16	2.14	2.12	2.10	2.11	2.13	2.16	2.23	2.29	2.29	2.18	1.98				
160		1.99	2.01	2.03	2.04	2.05	2.05	2.04	2.03	2.02	2.02	2.08	2.13	2.13	2.01	1.81				
165		1.65	1.71	1.76	1.81	1.85	1.87	1.89	1.88	1.86	1.85	1.88	1.90	1.88	1.78	1.61				
170		1.13	1.20	1.29	1.38	1.46	1.53	1.58	1.59	1.59	1.59	1.61	1.62	1.61	1.54	1.45				
175		1.11	1.14	1.19	1.24	1.32	1.39	1.46	1.49	1.51	1.52	1.54	1.54	1.54	1.50	1.45				
180		1.22	1.26	1.29	1.33	1.36	1.38	1.40	1.38	1.38	1.37	1.37	1.37	1.37	1.40	1.43				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34S @ 35W / 5000K	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	0.325	38.8	0.995	2.81
277.0	60	0.151	38.5	0.923	6.21

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*****