

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

Dongguan New Testing Centre Co., Ltd.

Prepare by:

Alan Wang

Engineer: Alan Wang

Date: 2023-06-14

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

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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		4312
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		152.4
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		4192
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	148.1
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		28.3
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	3.36
			277V	9.58
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.994
			277V	0.872
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4026
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		75.4
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		277.0
(Goniophotometer – Section 4.2)		Non-Worst Case		120.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.117
(Goniophotometer – Section 4.2)		Non-Worst Case		0.236
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		28.3
(Goniophotometer – Section 4.2)		Non-Worst Case		28.1

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34S @ 25W / 4000K	230612003-S1
2	Goniophotometer Test	2023-06-13	W34S @ 25W / 4000K	230612003-S1
3	THD and PF Test	2023-06-13	W34S @ 25W / 4000K	230612003-S1

Remark (If any)

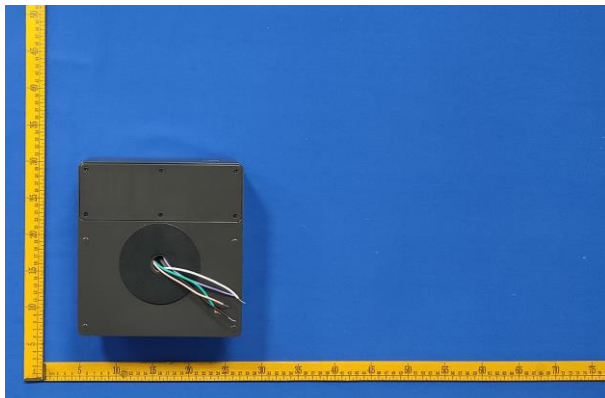
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34S @ 25W / 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 @ 25W / 4000K	Sample ID	230612003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

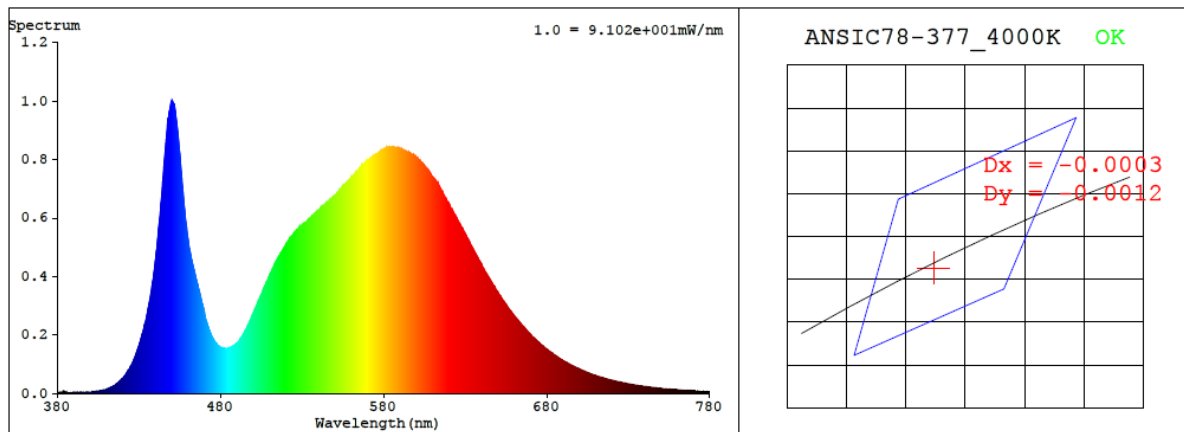
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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. 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	0.236	28.1	0.994
277.0	60	0.117	28.3	0.872

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4026	75.4	-21	-0.0005	77	94	-16%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3790$ $y = 0.3749$ / $u' = 0.2249$ $v' = 0.5005$ ($duv = -4.53e-04$)

CCT= 4026K Prcp WL: Ld=579.2nm Purity=26.2%

Peak WL: Lp=450nm FWHM: =20.1nm Ratio:R=17.2% G=79.9% B=2.9%

Render Index: Ra = 75.4 AvgR = 66.2 TM30:Rf=77 Rg=94

EEL: 0.09109 A++ Highest

R1 =73 R2 =83 R3 =90 R4 =74 R5 =72 R6 =75 R7 =82

R8 =55 R9 =-21 R10=58 R11=70 R12=48 R13=75 R14=94 R15=66

4.1 Integrating Sphere Test

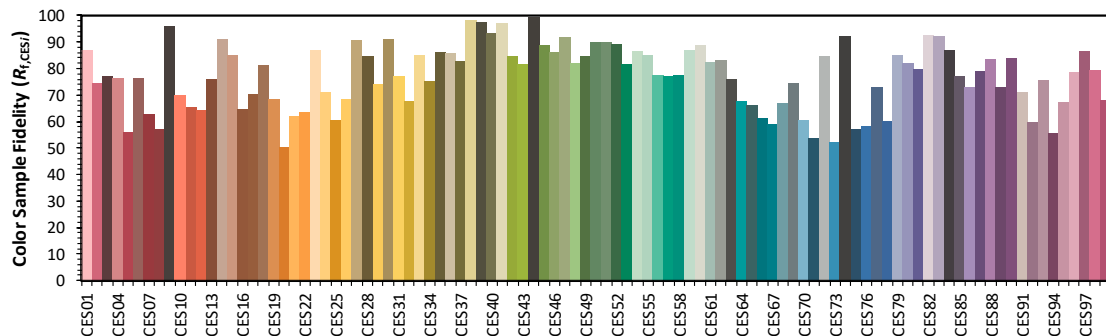
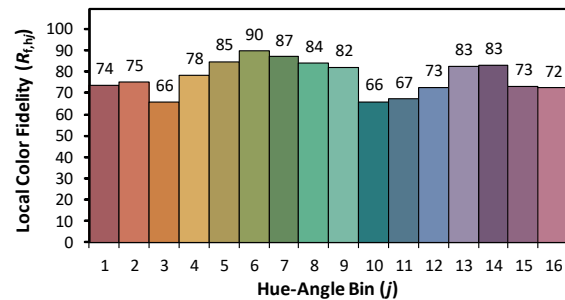
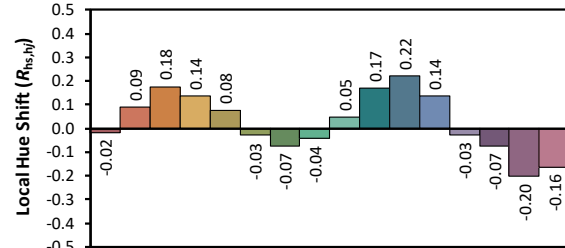
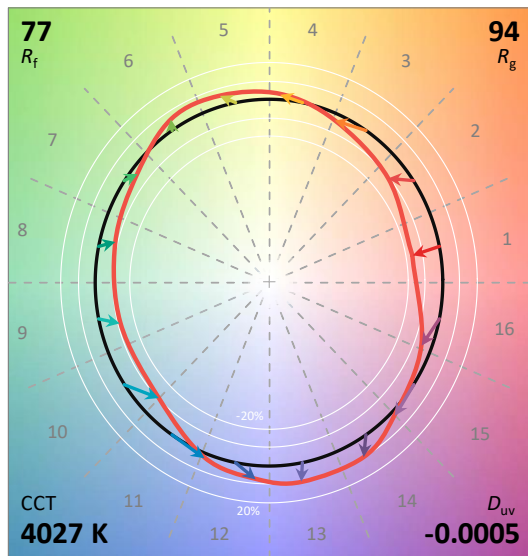
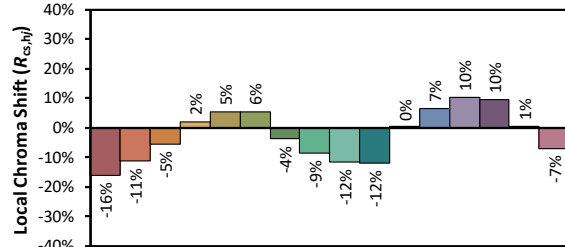
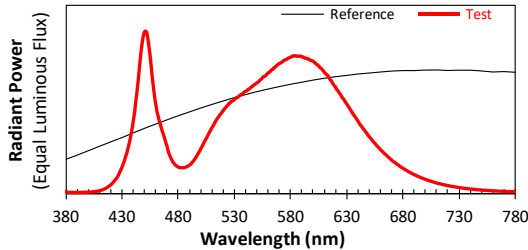
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34S @ 25W / 4000K



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

x 0.3789

y 0.3747

u' 0.2249

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	7.50E-06	447	8.89E-04	514	4.52E-04	581	8.38E-04	648	3.65E-04	715	5.24E-05
381	3.70E-06	448	9.36E-04	515	4.61E-04	582	8.42E-04	649	3.53E-04	716	5.09E-05
382	4.30E-06	449	9.75E-04	516	4.70E-04	583	8.40E-04	650	3.46E-04	717	4.93E-05
383	2.50E-06	450	9.92E-04	517	4.81E-04	584	8.42E-04	651	3.37E-04	718	4.78E-05
384	4.20E-06	451	9.93E-04	518	4.88E-04	585	8.41E-04	652	3.29E-04	719	4.65E-05
385	2.90E-06	452	9.77E-04	519	4.98E-04	586	8.39E-04	653	3.20E-04	720	4.48E-05
386	3.30E-06	453	9.33E-04	520	5.07E-04	587	8.40E-04	654	3.12E-04	721	4.36E-05
387	2.80E-06	454	8.83E-04	521	5.16E-04	588	8.40E-04	655	3.05E-04	722	4.21E-05
388	3.10E-06	455	8.24E-04	522	5.24E-04	589	8.40E-04	656	2.95E-04	723	4.08E-05
389	2.10E-06	456	7.55E-04	523	5.33E-04	590	8.35E-04	657	2.88E-04	724	3.96E-05
390	3.20E-06	457	6.90E-04	524	5.39E-04	591	8.35E-04	658	2.81E-04	725	3.88E-05
391	3.80E-06	458	6.31E-04	525	5.50E-04	592	8.30E-04	659	2.73E-04	726	3.75E-05
392	3.80E-06	459	5.77E-04	526	5.53E-04	593	8.28E-04	660	2.65E-04	727	3.62E-05
393	3.50E-06	460	5.34E-04	527	5.61E-04	594	8.27E-04	661	2.59E-04	728	3.52E-05
394	3.30E-06	461	4.95E-04	528	5.65E-04	595	8.22E-04	662	2.53E-04	729	3.40E-05
395	3.50E-06	462	4.68E-04	529	5.68E-04	596	8.23E-04	663	2.45E-04	730	3.31E-05
396	4.30E-06	463	4.40E-04	530	5.76E-04	597	8.17E-04	664	2.39E-04	731	3.19E-05
397	4.20E-06	464	4.16E-04	531	5.81E-04	598	8.13E-04	665	2.33E-04	732	3.09E-05
398	4.30E-06	465	3.92E-04	532	5.85E-04	599	8.12E-04	666	2.27E-04	733	2.99E-05
399	5.40E-06	466	3.71E-04	533	5.88E-04	600	8.09E-04	667	2.20E-04	734	2.90E-05
400	5.30E-06	467	3.49E-04	534	5.96E-04	601	8.03E-04	668	2.14E-04	735	2.81E-05
401	5.70E-06	468	3.27E-04	535	6.00E-04	602	7.97E-04	669	2.08E-04	736	2.71E-05
402	5.80E-06	469	3.02E-04	536	6.05E-04	603	7.90E-04	670	2.02E-04	737	2.67E-05
403	6.40E-06	470	2.82E-04	537	6.09E-04	604	7.86E-04	671	1.95E-04	738	2.58E-05
404	8.30E-06	471	2.52E-04	538	6.15E-04	605	7.79E-04	672	1.91E-04	739	2.46E-05
405	8.00E-06	472	2.34E-04	539	6.22E-04	606	7.71E-04	673	1.86E-04	740	2.41E-05
406	9.60E-06	473	2.18E-04	540	6.25E-04	607	7.66E-04	674	1.80E-04	741	2.34E-05
407	1.00E-05	474	2.04E-04	541	6.27E-04	608	7.58E-04	675	1.76E-04	742	2.27E-05
408	1.13E-05	475	1.91E-04	542	6.37E-04	609	7.50E-04	676	1.71E-04	743	2.20E-05
409	1.28E-05	476	1.82E-04	543	6.38E-04	610	7.40E-04	677	1.65E-04	744	2.14E-05
410	1.49E-05	477	1.73E-04	544	6.45E-04	611	7.34E-04	678	1.61E-04	745	2.04E-05
411	1.68E-05	478	1.67E-04	545	6.51E-04	612	7.27E-04	679	1.55E-04	746	1.98E-05
412	1.80E-05	479	1.62E-04	546	6.55E-04	613	7.21E-04	680	1.51E-04	747	1.97E-05
413	2.20E-05	480	1.58E-04	547	6.62E-04	614	7.09E-04	681	1.47E-04	748	1.88E-05
414	2.45E-05	481	1.56E-04	548	6.67E-04	615	6.97E-04	682	1.43E-04	749	1.85E-05
415	2.69E-05	482	1.55E-04	549	6.71E-04	616	6.90E-04	683	1.39E-04	750	1.77E-05
416	3.18E-05	483	1.55E-04	550	6.77E-04	617	6.77E-04	684	1.35E-04	751	1.71E-05
417	3.58E-05	484	1.54E-04	551	6.81E-04	618	6.67E-04	685	1.31E-04	752	1.64E-05
418	4.10E-05	485	1.56E-04	552	6.88E-04	619	6.57E-04	686	1.27E-04	753	1.61E-05
419	4.69E-05	486	1.57E-04	553	6.95E-04	620	6.50E-04	687	1.23E-04	754	1.57E-05
420	5.13E-05	487	1.60E-04	554	7.00E-04	621	6.35E-04	688	1.20E-04	755	1.51E-05
421	5.82E-05	488	1.64E-04	555	7.09E-04	622	6.28E-04	689	1.16E-04	756	1.48E-05
422	6.61E-05	489	1.67E-04	556	7.15E-04	623	6.16E-04	690	1.12E-04	757	1.42E-05
423	7.54E-05	490	1.72E-04	557	7.17E-04	624	6.09E-04	691	1.09E-04	758	1.38E-05
424	8.27E-05	491	1.77E-04	558	7.23E-04	625	5.97E-04	692	1.07E-04	759	1.35E-05
425	9.23E-05	492	1.86E-04	559	7.31E-04	626	5.84E-04	693	1.03E-04	760	1.29E-05
426	1.03E-04	493	1.94E-04	560	7.38E-04	627	5.77E-04	694	9.99E-05	761	1.26E-05
427	1.17E-04	494	2.03E-04	561	7.41E-04	628	5.67E-04	695	9.68E-05	762	1.22E-05
428	1.33E-04	495	2.13E-04	562	7.48E-04	629	5.56E-04	696	9.36E-05	763	1.17E-05
429	1.48E-04	496	2.23E-04	563	7.57E-04	630	5.46E-04	697	9.16E-05	764	1.17E-05
430	1.63E-04	497	2.35E-04	564	7.59E-04	631	5.35E-04	698	8.89E-05	765	1.11E-05
431	1.83E-04	498	2.48E-04	565	7.68E-04	632	5.25E-04	699	8.60E-05	766	1.10E-05
432	2.02E-04	499	2.59E-04	566	7.73E-04	633	5.13E-04	700	8.36E-05	767	1.05E-05
433	2.26E-04	500	2.73E-04	567	7.79E-04	634	5.02E-04	701	8.10E-05	768	1.04E-05
434	2.46E-04	501	2.85E-04	568	7.85E-04	635	4.92E-04	702	7.85E-05	769	1.00E-05
435	2.75E-04	502	2.99E-04	569	7.91E-04	636	4.82E-04	703	7.64E-05	770	9.60E-06
436	3.02E-04	503	3.13E-04	570	7.96E-04	637	4.71E-04	704	7.37E-05	771	9.50E-06
437	3.34E-04	504	3.25E-04	571	7.98E-04	638	4.61E-04	705	7.19E-05	772	9.40E-06
438	3.70E-04	505	3.37E-04	572	8.03E-04	639	4.51E-04	706	6.94E-05	773	8.60E-06
439	4.09E-04	506	3.52E-04	573	8.08E-04	640	4.40E-04	707	6.70E-05	774	8.40E-06
440	4.54E-04	507	3.65E-04	574	8.15E-04	641	4.29E-04	708	6.50E-05	775	8.40E-06
441	5.01E-04	508	3.79E-04	575	8.17E-04	642	4.18E-04	709	6.31E-05	776	8.10E-06
442	5.65E-04	509	3.91E-04	576	8.19E-04	643	4.10E-04	710	6.09E-05	777	7.90E-06
443	6.20E-04	510	4.03E-04	577	8.24E-04	644	4.00E-04	711	5.92E-05	778	7.70E-06
444	6.84E-04	511	4.14E-04	578	8.28E-04	645	3.91E-04	712	5.73E-05	779	7.40E-06
445	7.56E-04	512	4.27E-04	579	8.31E-04	646	3.82E-04	713	5.58E-05	780	7.40E-06
446	8.26E-04	513	4.39E-04	580	8.34E-04	647	3.73E-04	714	5.43E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34S @ 25W / 4000K	Sample ID	230612003-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	277.0	60	0.117	28.3	0.872
NON-WORST CASE	120.0	60	0.236	28.1	0.994

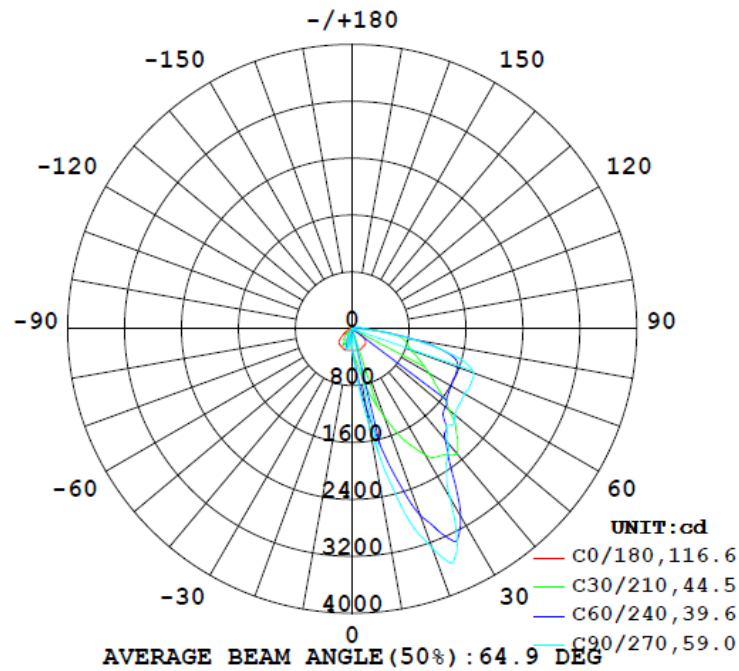
Test Result

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	4312	83.7	131.6	55.0	79.4	152.4	4.5%	B0-U3-G2
0°-90° zones	4192	83.7	131.6	55.0	79.4	148.1	4.6%	B0-U3-G2

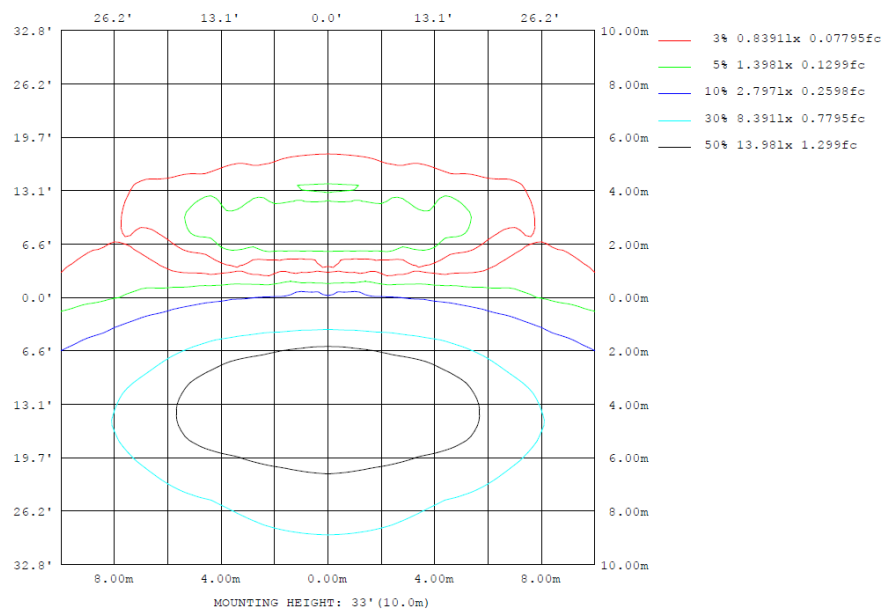
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

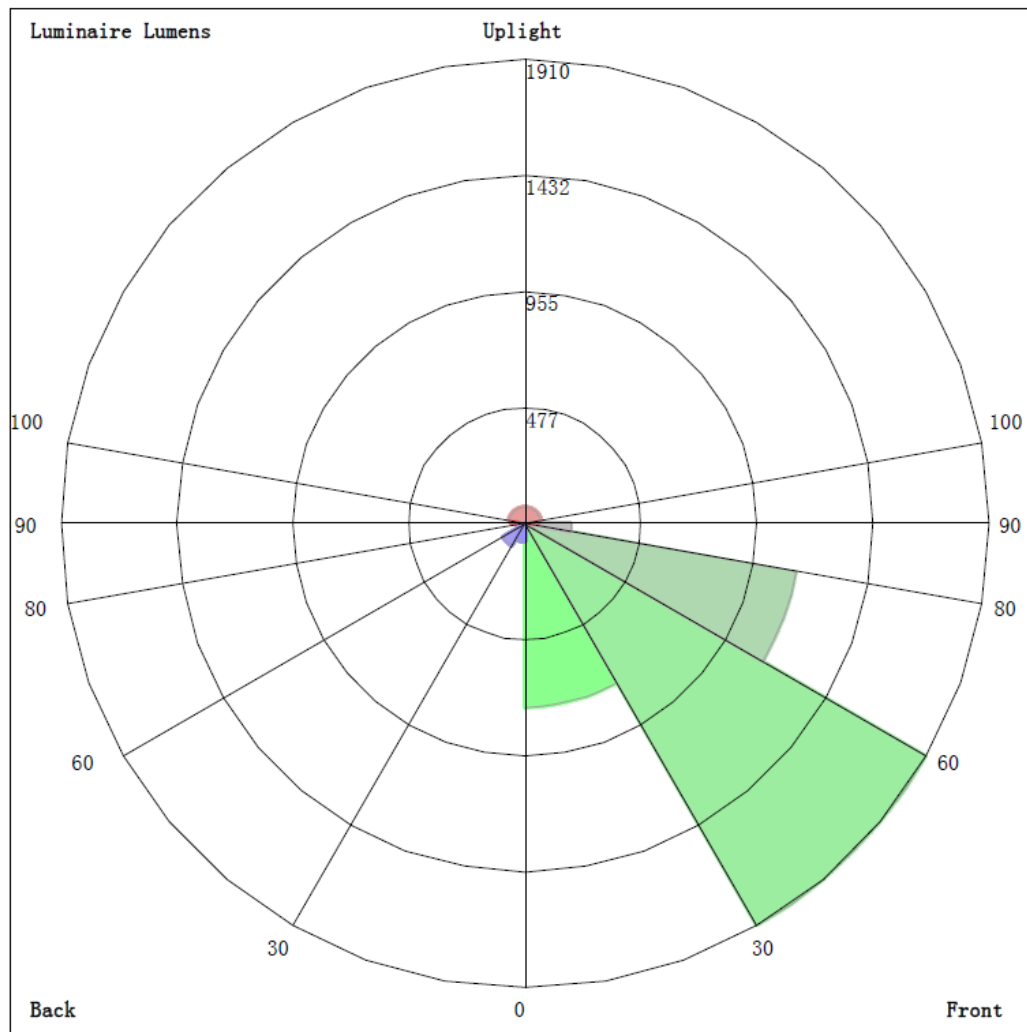
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	± zone	± total	%lum, lamp
10	303.7	875.8	1390	875.8	303.7	69.34	156.4	69.34	0- 10	36.00	36.00	0.83,0.83
20	317.0	2051	3277	2051	317.0	251.0	166.9	251.0	10- 20	236.7	272.7	6.32,6.32
30	296.9	3000	2749	3000	296.9	186.3	90.44	186.3	20- 30	556.2	828.9	19.2,19.2
40	282.8	2433	2087	2433	282.8	98.72	31.97	98.72	30- 40	674.9	1504	34.9,34.9
50	228.2	1709	1885	1709	228.2	44.04	4.385	44.04	40- 50	681.5	2185	50.7,50.7
60	137.5	1450	1823	1450	137.5	15.49	1.213	15.49	50- 60	658.5	2844	65.9,65.9
70	72.19	1361	1810	1361	72.19	8.670	0.2535	8.670	60- 70	630.3	3474	80.6,80.6
80	23.20	979.6	873.3	979.6	23.20	5.571	0.6690	5.571	70- 80	525.6	4000	92.8,92.8
90	7.454	172.7	185.8	172.7	7.454	3.259	1.205	3.259	80- 90	192.5	4192	97.2,97.2
100	5.123	76.95	122.8	76.95	5.123	2.325	1.569	2.325	90-100	53.49	4246	98.5,98.5
110	4.152	34.26	53.26	34.26	4.152	2.209	1.660	2.209	100-110	27.10	4273	99.1,99.1
120	3.053	29.22	38.79	29.22	3.053	2.180	1.646	2.180	110-120	15.53	4288	99.4,99.4
130	2.529	19.78	32.16	19.78	2.529	2.237	1.936	2.237	120-130	11.07	4299	99.7,99.7
140	2.013	11.38	19.54	11.38	2.013	2.061	2.091	2.061	130-140	7.462	4307	99.9,99.9
150	1.549	6.944	11.28	6.944	1.549	1.784	1.935	1.784	140-150	3.375	4310	100,100
160	1.214	3.101	5.418	3.101	1.214	1.619	1.491	1.619	150-160	1.516	4312	100,100
170	1.042	0.7679	0.6315	0.7679	1.042	1.253	0.8492	1.253	160-170	0.4682	4312	100,100
180	1.173	1.050	0.9978	1.050	1.173	1.104	0.9391	1.104	170-180	0.0923	4312	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	36.00	0-10	36.00	0.83%
10-20	236.70	0-20	272.70	6.32%
20-30	556.20	0-30	828.90	19.22%
30-40	674.89	0-40	1503.79	34.87%
40-50	681.54	0-50	2185.33	50.68%
50-60	658.53	0-60	2843.86	65.95%
60-70	630.35	0-70	3474.21	80.56%
70-80	525.57	0-80	3999.78	92.75%
80-90	192.54	0-90	4192.32	97.22%
90-100	53.49	0-100	4245.81	98.46%
100-110	27.10	0-110	4272.91	99.09%
110-120	15.53	0-120	4288.44	99.45%
120-130	11.07	0-130	4299.51	99.70%
130-140	7.46	0-140	4306.97	99.88%
140-150	3.38	0-150	4310.35	99.95%
150-160	1.52	0-160	4311.87	99.99%
160-170	0.47	0-170	4312.34	100.00%
170-180	0.09	0-180	4312.43	100.00%

4.2 Goniophotometer Test

LCS/BUG

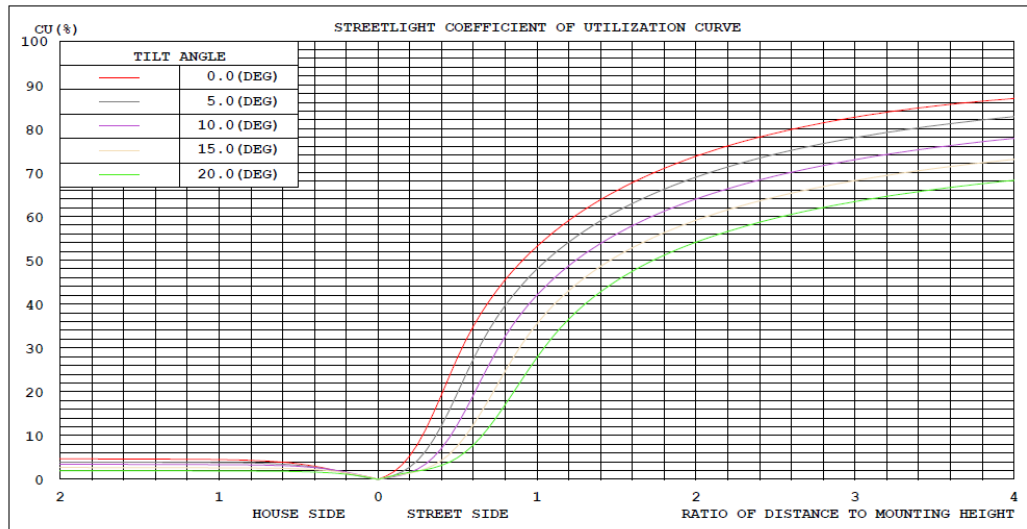


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

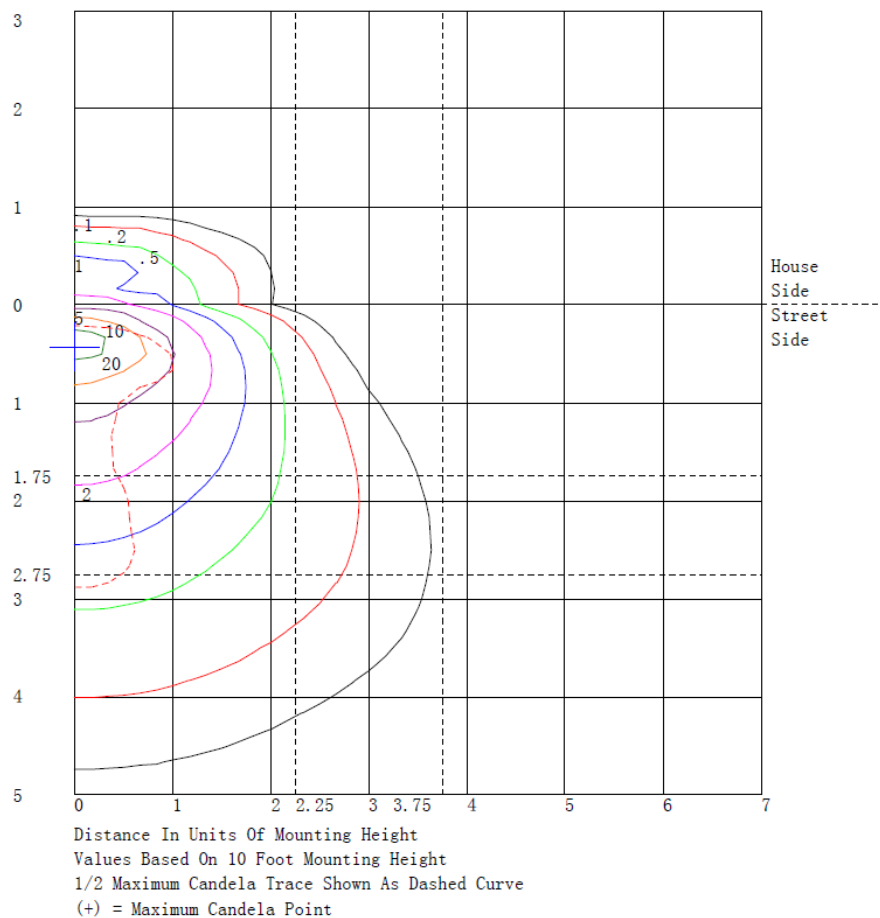
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	754.6	N.A.	17.5
FM - Front-Medium (30-60)	1909.7	N.A.	44.3
FH - Front-High (60-80)	1132.8	N.A.	26.3
FVH - Front-Very High (80-90)	189.3	N.A.	4.4
BL - Back-Low (0-30)	74.3	N.A.	1.7
BM - Back-Medium (30-60)	105.3	N.A.	2.4
BH - Back-High (60-80)	23.1	N.A.	0.5
BVH - Back-Very High (80-90)	3.3	N.A.	0.1
UL - Uplight-Low (90-100)	53.5	N.A.	1.2
UH - Uplight-High (100-180)	66.6	N.A.	1.5
Total	4312.5	N.A.	100.0
BUG Rating	B0-U3-G2		

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	301	301	301	302	302	302	302	303	303	304	304	305	305	306	306	306	307	307	307
5	303	313	326	342	361	381	402	420	438	456	478	501	523	543	562	578	590	599	603
10	304	332	369	414	467	529	600	688	781	876	966	1052	1133	1206	1269	1321	1358	1381	1390
15	312	351	417	509	637	784	944	1101	1264	1430	1606	1779	1942	2084	2209	2313	2398	2457	2485
20	317	400	516	665	859	1078	1315	1555	1801	2051	2317	2568	2789	2932	3039	3118	3196	3250	3277
25	310	434	604	819	1099	1409	1731	2037	2333	2611	2867	3090	3269	3366	3422	3448	3466	3470	3467
30	297	452	661	924	1273	1652	2038	2413	2743	3000	3085	3092	3045	2979	2898	2819	2778	2754	2749
35	294	458	681	965	1361	1778	2177	2500	2742	2880	2787	2621	2434	2363	2319	2297	2287	2288	2294
40	283	447	679	980	1437	1896	2292	2438	2477	2433	2310	2164	2033	2033	2065	2107	2103	2095	2087
45	267	486	737	1022	1410	1778	2072	2112	2066	1975	1926	1879	1842	1838	1846	1863	1885	1906	1920
50	228	469	716	971	1280	1561	1779	1806	1771	1709	1698	1698	1711	1753	1801	1846	1868	1881	1885
55	180	432	669	892	1119	1318	1475	1532	1553	1555	1578	1605	1636	1689	1743	1792	1820	1836	1840
60	137	373	588	783	960	1114	1242	1330	1396	1450	1503	1552	1602	1668	1731	1784	1810	1823	1823
65	103	279	447	608	764	911	1049	1177	1293	1394	1468	1533	1592	1667	1736	1794	1823	1836	1837
70	72.2	159	265	390	544	710	882	1055	1218	1361	1448	1516	1572	1647	1715	1770	1798	1810	1810
75	44.1	82.6	156	264	425	607	798	981	1148	1288	1364	1412	1441	1475	1501	1517	1521	1518	1512
80	23.2	45.8	104	199	356	529	698	822	917	980	979	954	919	907	899	892	883	877	873
85	14.7	40.0	79.8	134	220	307	385	417	431	429	414	394	373	368	367	368	364	362	360
90	7.45	14.6	26.8	44.0	70.2	98.3	126	146	162	173	172	169	165	169	175	182	184	185	186
95	5.77	8.76	14.7	23.6	36.4	51.4	68.1	87.3	105	121	126	128	129	136	143	150	153	155	156
100	5.12	8.21	12.3	17.4	23.1	30.2	38.8	51.3	64.5	77.0	84.8	91.3	97.1	105	112	118	121	122	123
105	4.98	7.52	10.7	14.5	19.1	24.2	29.5	34.2	39.0	44.2	50.4	57.1	64.0	71.7	78.9	84.9	87.9	89.3	89.4
110	4.15	6.00	8.56	11.8	16.5	21.3	26.0	29.0	31.6	34.3	38.0	41.8	45.5	48.5	50.9	52.7	53.3	53.5	53.3
115	3.46	4.94	7.14	10.1	14.4	18.9	23.2	25.7	27.8	29.8	32.5	35.2	37.9	40.7	43.2	45.1	45.4	45.1	44.7
120	3.05	4.44	6.21	8.35	10.8	13.7	17.0	21.3	25.5	29.2	30.9	32.1	33.1	35.1	37.0	38.6	39.0	39.0	38.8
125	2.78	3.60	4.87	6.57	8.60	11.2	14.3	19.1	23.9	28.2	30.0	31.1	31.7	32.7	33.5	34.0	33.9	33.6	33.3
130	2.53	2.88	3.73	5.09	7.15	9.57	12.2	14.4	16.9	19.8	24.6	29.4	33.3	34.0	33.8	32.9	32.6	32.3	32.2
135	2.25	2.31	2.88	3.93	5.81	7.94	10.1	11.4	12.7	14.2	16.5	19.3	22.9	28.1	33.4	38.1	40.7	42.2	42.7
140	2.01	1.88	2.19	2.96	4.45	6.18	7.95	9.15	10.3	11.4	12.8	14.2	15.6	16.9	18.0	18.9	19.4	19.5	19.5
145	1.77	1.29	1.27	1.74	2.97	4.47	6.01	7.01	7.92	8.81	9.95	11.1	12.2	13.1	13.8	14.4	14.6	14.6	14.5
150	1.55	1.08	0.98	1.25	2.07	3.13	4.28	5.21	6.09	6.94	7.78	8.57	9.29	9.97	10.5	11.0	11.2	11.3	11.3
155	1.34	1.08	1.01	1.14	1.51	2.04	2.71	3.52	4.38	5.20	5.87	6.45	6.91	7.22	7.42	7.55	7.60	7.60	7.57
160	1.21	1.16	1.13	1.12	1.05	1.06	1.21	1.75	2.41	3.10	3.65	4.14	4.56	4.92	5.19	5.39	5.45	5.45	5.42
165	1.10	1.08	1.07	1.04	1.00	0.96	0.94	0.94	0.98	1.09	1.39	1.74	2.09	2.36	2.59	2.77	2.88	2.95	2.98
170	1.04	1.02	1.00	0.98	0.95	0.92	0.88	0.84	0.81	0.77	0.73	0.70	0.67	0.65	0.63	0.62	0.61	0.62	0.63
175	1.03	1.08	1.07	1.05	1.04	1.02	1.00	0.97	0.95	0.92	0.89	0.87	0.84	0.82	0.80	0.78	0.77	0.77	0.79
180	1.17	1.17	1.17	1.16	1.15	1.13	1.12	1.10	1.07	1.05	1.03	1.01	0.99	0.97	0.95	0.95	0.96	0.97	1.00

C (DEG)																	UNIT: cd		
y (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	307	307	306	306	306	305	305	304	304	303	303	302	302	302	302	301	301	301	304
5	599	590	578	562	543	523	501	478	456	438	420	402	381	361	342	326	313	303	306
10	1381	1358	1321	1269	1206	1133	1052	966	876	781	688	600	529	467	414	369	332	304	251
15	2457	2398	2313	2209	2084	1942	1779	1606	1430	1264	1101	944	784	637	509	417	351	312	225
20	3250	3196	3118	3039	2932	2789	2568	2317	2051	1801	1555	1315	1078	859	665	516	400	317	211
25	3470	3466	3448	3422	3366	3269	3090	2867	2611	2333	2037	1731	1409	1099	819	604	434	310	193
30	2754	2778	2819	2898	2979	3045	3092	3085	3000	2743	2413	2038	1652	1273	924	661	452	297	190
35	2288	2287	2297	2319	2363	2434	2621	2787	2880	2742	2500	2177	1778	1361	965	681	458	294	220
40	2095	2103	2107	2065	2033	2033	2164	2310	2433	2477	2438	2292	1896	1437	980	679	447	283	238
45	1906	1885	1863	1846	1838	1842	1879	1926	1975	2066	2112	2072	1778	1410	1022	737	486	267	241
50	1881	1868	1846	1801	1753	1711	1698	1698	1709	1771	1806	1779	1561	1280	971	716	469	228	216
55	1836	1820	1792	1743	1689	1636	1605	1578	1555	1553	1532	1475	1318	1119	892	669	432	180	172
60	1823	1810	1784	1731	1668	1602	1552	1503	1450	1396	1330	1242	1114	960	783	588	373	137	143
65	1836	1823	1794	1736	1667	1592	1533	1468	1394	1293	1177	1049	911	764	608	447	279	103	108
70	1810	1798	1770	1715	1647	1572	1516	1448	1361	1218	1055	882	710	544	390	265	159	72.2	68.9
75	1518	1521	1517	1501	1475	1441	1412	1364	1288	1148	981	798	607	425	264	156	82.6	44.1	40.1
80	877	883	892	899	907	919	954	979	980	917	822	698	529	356	199	104	45.8	23.2	22.6
85	362	364	368	367	368	373	394	414	429	431	417	385	307	220	134	79.8	40.0	14.7	15.1
90	185	184	182	175	169	165	169	172	173	162	146	126	98.3	70.2	44.0	26.8	14.6	7.45	7.24
95	155	153	150	143	136	129	128	126	121	105	87.3	68.1	51.4	36.4	23.6	14.7	8.76	5.77	5.80
100	122	121	118	112	105	97.1	91.3	84.8	77.0	64.5	51.3	38.8	30.2	23.1	17.4	12.3	8.21	5.12	4.93
105	89.3	87.9	84.9	78.9	71.7	64.0	57.1	50.4	44.2	39.0	34.2	29.5	24.2	19.1	14.5	10.7	7.52	4.98	4.88
110	53.5	53.3	52.7	50.9	48.5	45.5	41.8	38.0	34.3	31.6	29.0	26.0	21.3	16.5	11.8	8.56	6.00	4.15	4.41
115	45.1	45.4	45.1	43.2	40.7	37.9	35.2	32.5	29.8	27.8	25.7	23.2	18.9	14.4	10.1	7.14	4.94	3.46	4.23
120	39.0	39.0	38.6	37.0	35.1	33.1	32.1	30.9	29.2	25.5	21.3	17.0	13.7	10.8	8.35	6.21	4.44	3.05	4.27
125	33.6	33.9	34.0	33.5	32.7	31.7	31.1	30.0	28.2	23.9	19.1	14.3	11.2	8.60	6.57	4.87	3.60	2.78	3.75
130	32.3	32.6	32.9	33.8	34.0	33.3	29.4	24.6	19.8	16.9	14.4	12.2	9.57	7.15	5.09	3.73	2.88	2.53	2.98
135	42.2	40.7	38.1	33.4	28.1	22.9	19.3	16.5	14.2	12.7	11.4	10.1	7.94	5.81	3.93	2.88	2.31	2.25	2.60
140	19.5	19.4	18.9	18.0	16.9	15.6	14.2	12.8	11.4	10.3	9.15	7.95	6.18	4.45	2.96	2.19	1.88	2.01	2.23
145	14.6	14.6	14.4	13.8	13.1	12.2	11.1	9.95	8.81	7.92	7.01	6.01	4.47	2.97	1.74	1.27	1.29	1.77	1.93
150	11.3	11.2	11.0	10.5	9.97	9.29	8.57	7.78	6.94	6.20	5.31	4.28	3.13	2.07	1.25	0.98	1.08	1.54	1.74
155	7.60	7.60	7.55	7.42	7.22	6.91	6.45	5.78	5.09	4.38	3.52	2.71	2.04	1.51	1.14	1.01	1.08	1.35	1.57
160	5.45	5.45	5.39	5.19	4.92	4.56	4.14	3.65	3.10	2.41	1.75	1.21	0.96	1.05	1.12	1.13	1.16	1.21	1.43
165	2.95	2.88	2.77	2.59	2.36	2.09	1.74	1.39	1.09	0.98	0.94	0.94	0.96	1.00	1.04	1.07	1.08	1.10	1.28
170	0.62	0.61	0.62	0.63	0.65	0.67	0.70	0.73	0.77	0.81	0.84	0.88	0.92	0.95	0.98	1.00	1.02	1.04	1.15
175	0.77	0.77	0.78	0.80	0.82	0.84	0.87	0.89	0.92	0.95	0.97	1.00	1.02	1.04	1.05	1.07	1.08	1.09	1.15
180	0.97	0.97	0.96	0.95	0.95	0.97	0.99	1.01	1.03	1.05	1.07	1.10	1.12	1.13	1.15	1.16	1.17	1.17	1.17

Table--3

UNIT: cd

C (DEG) γ (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	307	309	310	310	310	310	310	310	310	310	310	309	309	309	308	307	307	307	308
5	300	295	256	222	187	158	133	114	104	99.4	97.5	95.0	93.4	92.5	91.5	90.9	90.6	90.9	91.5
10	206	167	136	112	93.4	79.8	71.8	69.3	73.9	82.9	95.3	111	127	141	150	155	156	155	150
15	158	110	83.8	75.7	84.0	114	152	191	218	239	254	255	253	250	257	265	271	265	257
20	138	97.3	103	130	169	201	230	251	250	241	225	206	188	172	167	166	167	166	167
25	119	85.0	120	176	231	227	211	190	186	184	181	169	156	144	138	135	134	135	138
30	124	98.5	146	210	270	257	225	186	164	144	128	117	108	102	96.6	92.5	90.4	92.5	96.6
35	168	139	148	169	189	178	159	136	116	97.8	82.6	75.7	72.1	70.6	68.3	66.9	66.4	66.9	68.3
40	205	183	184	188	189	163	131	98.7	80.8	67.3	56.9	47.0	39.2	33.8	31.7	31.3	32.0	31.3	31.7
45	217	195	176	158	140	118	95.6	74.7	58.4	44.8	33.9	26.2	20.8	17.2	14.4	12.9	12.4	12.9	14.4
50	200	181	157	130	104	81.6	61.4	44.0	30.9	20.8	13.4	9.02	6.57	5.48	4.59	4.28	4.39	4.28	4.59
55	160	145	123	99.4	75.8	55.7	38.2	24.0	16.0	11.1	8.25	5.52	3.74	2.71	2.22	2.14	2.31	2.14	2.22
60	140	129	104	75.0	47.1	32.4	22.2	15.5	10.6	7.62	5.81	3.82	2.38	1.45	1.09	1.06	1.21	1.06	1.09
65	106	97.2	74.8	49.7	26.4	17.6	13.1	11.4	8.32	5.98	4.20	2.61	1.41	0.60	0.32	0.30	0.43	0.30	0.32
70	63.4	55.8	43.8	31.3	19.9	14.4	10.9	8.67	6.34	4.53	3.13	1.87	0.91	0.26	0.08	0.12	0.25	0.12	0.08
75	35.7	30.8	24.7	18.8	13.4	10.3	8.15	6.57	5.01	3.73	2.68	1.72	0.96	0.43	0.29	0.31	0.42	0.31	0.29
80	21.4	19.5	16.5	13.2	10.1	8.20	6.74	5.57	4.40	3.39	2.51	1.73	1.11	0.67	0.56	0.58	0.67	0.58	0.56
85	14.8	13.9	11.9	9.62	7.39	6.18	5.25	4.51	3.66	2.90	2.23	1.67	1.23	0.93	0.85	0.87	0.93	0.87	0.85
90	6.91	6.48	5.86	5.19	4.54	4.08	3.66	3.26	2.76	2.29	1.86	1.56	1.33	1.19	1.15	1.17	1.20	1.17	1.15
95	5.68	5.40	4.84	4.21	3.59	3.19	2.85	2.55	2.21	1.91	1.66	1.52	1.43	1.39	1.39	1.40	1.42	1.40	1.39
100	4.69	4.41	4.08	3.72	3.35	2.99	2.64	2.32	2.05	1.83	1.66	1.58	1.54	1.54	1.54	1.55	1.57	1.55	1.54
105	4.68	4.39	3.94	3.46	2.99	2.70	2.47	2.27	2.05	1.86	1.71	1.65	1.63	1.63	1.64	1.65	1.67	1.65	1.64
110	4.48	4.36	3.92	3.38	2.84	2.57	2.37	2.21	2.01	1.84	1.71	1.65	1.63	1.64	1.64	1.65	1.66	1.65	1.64
115	4.64	4.70	4.17	3.45	2.72	2.46	2.30	2.20	2.01	1.85	1.71	1.66	1.63	1.63	1.63	1.64	1.65	1.64	1.63
120	4.98	5.17	4.51	3.58	2.63	2.35	2.23	2.18	2.02	1.87	1.74	1.69	1.66	1.65	1.65	1.65	1.65	1.65	1.65
125	4.32	4.50	4.03	3.34	2.64	2.40	2.28	2.21	2.08	1.95	1.86	1.81	1.79	1.78	1.77	1.76	1.76	1.76	1.77
130	3.26	3.36	3.19	2.91	2.60	2.45	2.33	2.24	2.13	2.04	1.98	1.96	1.95	1.96	1.95	1.94	1.94	1.94	1.95
135	2.82	2.93	2.85	2.70	2.51	2.39	2.28	2.18	2.11	2.05	2.02	2.02	2.04	2.06	2.07	2.07	2.06	2.07	2.07
140	2.38	2.46	2.47	2.43	2.35	2.26	2.15	2.06	2.01	1.99	1.98	2.00	2.04	2.07	2.09	2.09	2.09	2.09	2.09
145	2.04	2.11	2.11	2.08	2.03	1.99	1.94	1.91	1.89	1.89	1.91	1.94	1.98	2.02	2.04	2.05	2.04	2.05	2.04
150	1.87	1.95	1.96	1.92	1.87	1.83	1.80	1.78	1.79	1.81	1.83	1.86	1.89	1.91	1.93	1.94	1.94	1.94	1.93
155	1.72	1.82	1.81	1.77	1.71	1.69	1.67	1.67	1.68	1.70	1.71	1.73	1.73	1.74	1.74	1.74	1.74	1.74	1.74
160	1.59	1.69	1.69	1.65	1.60	1.60	1.61	1.62	1.62	1.62	1.62	1.61	1.59	1.57	1.55	1.52	1.49	1.52	1.55
165	1.41	1.49	1.51	1.49	1.46	1.48	1.49	1.50	1.49	1.46	1.43	1.39	1.35	1.31	1.27	1.24	1.20	1.24	1.27
170	1.22	1.27	1.28	1.27	1.26	1.26	1.26	1.25	1.21	1.16	1.09	1.02	0.96	0.90	0.87	0.85	0.85	0.85	0.87
175	1.19	1.22	1.22	1.22	1.20	1.20	1.18	1.15	1.10	1.04	0.98	0.94	0.90	0.88	0.87	0.87	0.88	0.87	0.87
180	1.10	1.08	1.08	1.08	1.09	1.10	1.10	1.10	1.09	1.08	1.06	1.03	0.99	0.97	0.95	0.94	0.94	0.94	0.95

C (DEG) γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	309	309	309	310	310	310	310	310	310	310	310	310	309	307	304				
5	92.5	93.4	95.0	97.5	99.4	104	114	133	158	187	222	256	285	300	306				
10	141	127	111	95.3	82.9	73.9	69.3	71.8	79.8	93.4	112	136	167	206	251				
15	250	253	255	254	239	218	191	152	114	84.0	75.7	83.8	110	158	225				
20	172	188	206	225	241	250	251	230	201	169	130	103	97.3	138	211				
25	144	156	169	181	184	186	190	211	227	231	176	120	85.0	119	193				
30	102	108	117	128	144	164	186	225	257	270	210	146	98.5	124	190				
35	70.6	72.1	75.7	82.6	97.8	116	136	159	178	189	169	148	139	168	220				
40	33.8	39.2	47.0	56.9	67.3	80.8	98.7	131	163	189	188	184	183	205	238				
45	17.2	20.8	26.2	33.9	44.8	58.4	74.7	95.6	118	140	158	176	195	217	241				
50	5.48	6.57	9.02	13.4	20.8	30.9	44.0	61.4	81.6	104	130	157	181	200	216				
55	2.71	3.74	5.52	8.25	11.1	16.0	24.0	38.2	55.7	75.8	99.4	123	145	160	172				
60	1.45	2.38	3.82	5.81	7.62	10.6	15.5	22.2	32.4	47.1	75.0	104	129	140	143				
65	0.60	1.41	2.61	4.20	5.98	8.32	11.4	13.1	17.6	26.4	49.7	74.8	97.2	106	108				
70	0.26	0.91	1.87	3.13	4.53	6.34	8.67	10.9	14.4	19.9	31.3	43.8	55.8	63.4	68.9				
75	0.43	0.96	1.72	2.68	3.73	5.01	6.57	8.15	10.3	13.4	18.8	24.7	30.8	35.7	40.1				
80	0.67	1.11	1.73	2.51	3.39	4.40	5.57	6.74	8.20	10.1	13.2	16.5	19.5	21.4	22.6				
85	0.93	1.23	1.67	2.23	2.90	3.66	4.51	5.25	6.18	7.39	9.62	11.9	13.9	14.8	15.1				
90	1.19	1.33	1.56	1.86	2.29	2.76	3.26	3.66	4.08	4.54	5.19	5.86	6.48	6.91	7.24				
95	1.39	1.43	1.52	1.66	1.91	2.21	2.55	2.85	3.19	3.59	4.21	4.84	5.40	5.68	5.80				
100	1.54	1.54	1.58	1.66	1.83	2.05	2.32	2.64	2.99	3.35	3.72	4.08	4.41	4.69	4.93				
105	1.63	1.63	1.65	1.71	1.86	2.05	2.27	2.47	2.70	2.99	3.46	3.94	4.39	4.68	4.88				
110	1.64	1.63	1.65	1.71	1.84	2.01	2.21	2.37	2.57	2.84	3.38	3.92	4.36	4.48	4.41				
115	1.63	1.63	1.66	1.71	1.85	2.01	2.20	2.30	2.46	2.72	3.45	4.17	4.70	4.64	4.23				
120	1.65	1.66	1.69	1.74	1.87	2.02	2.18	2.23	2.35	2.63	3.58	4.51	5.17	4.98	4.27				
125	1.78	1.79	1.81	1.86	1.95	2.08	2.21	2.28	2.40	2.64	3.34	4.03	4.50	4.32	3.75				
130	1.96	1.95	1.96	1.98	2.04	2.13	2.24	2.33	2.45	2.60	2.91	3.19	3.36	3.26	2.98				
135	2.06	2.04	2.02	2.02	2.05	2.11	2.18	2.28	2.39	2.51	2.70	2.85	2.93	2.82	2.60				
140	2.07	2.04	2.00	1.98	1.99	2.01	2.06	2.15	2.26	2.35	2.43	2.47	2.46	2.38	2.23				
145	2.02	1.98	1.94	1.91	1.89	1.89	1.91	1.94	1.99	2.03	2.08	2.11	2.11	2.04	1.93				
150	1.91	1.89	1.86	1.83	1.81	1.79	1.78	1.80	1.83	1.87	1.92	1.96	1.95	1.87	1.74				
155	1.74	1.73	1.73	1.71	1.70	1.68	1.67	1.67	1.69	1.71	1.77	1.81	1.82	1.72	1.57				
160	1.57	1.59	1.61	1.62	1.62	1.62	1.62	1.61	1.60	1.60	1.65	1.69	1.69	1.59	1.43				
165	1.31	1.35	1.39	1.43	1.46	1.49	1.50	1.49	1.48	1.46	1.49	1.51	1.49	1.41	1.28				
170	0.90	0.96	1.02	1.09	1.16	1.21	1.25	1.26	1.26	1.26	1.27	1.28	1.27	1.22	1.15				
175	0.88	0.90	0.94	0.98	1.04	1.10	1.15	1.18	1.20	1.20	1.22	1.22	1.22	1.19	1.15				
180	0.97	0.99	1.03	1.06	1.08	1.09	1.10	1.10	1.10	1.09	1.08	1.08	1.08	1.10	1.13				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34S @ 25W / 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	0.236	28.1	0.994	3.36
277.0	60	0.117	28.3	0.872	9.58

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*****