

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

Issue Date: 2023-06-14

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		6174
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)		IES LM-79-2008	N/A		144.3
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)		IES LM-79-2008	300		5965
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)		IES LM-79-2008	Standard	Premium	139.4
			105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)		IES LM-79-2008	Worst Case		42.8
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)		ANSI C82.77:2014	20.00%	120V	2.43
				277V	12.52
Power Factor (THD & PF – Section 4.3)		ANSI C82.77:2014	0.9	120V	0.992
				277V	0.850
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)		IES LM-79-2008	7 steps	3045±175	3122
			4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)		IES LM-79-2008 CIE13.3-1995	≥70		76.3
Minimum R9 (Integrating Sphere – Section 4.1)		IES LM-79-2008 CIE13.3-1995	N/A		-18
Minimum Rf (Integrating Sphere – Section 4.1)		ANSI/IES TM-30-18	≥70		79
Minimum Rg (Integrating Sphere – Section 4.1)		ANSI/IES TM-30-18	≥89		95
IES Rcs,h1 (Integrating Sphere – Section 4.1)		ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-14%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)		IES LM-79-2008	≤10%		6.9%
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		0.182
(Goniophotometer – Section 4.2)			Non-Worst Case		0.358
Power (Input Wattage – W)					
(Goniophotometer – Section 4.2)		IES LM-79-2008	Worst Case		42.8
(Goniophotometer – Section 4.2)			Non-Worst Case		42.6

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34M @ 40W / 3000K	230612002-S1
2	Goniophotometer Test	2023-06-13	W34M @ 40W / 3000K	230612002-S1
3	THD and PF Test	2023-06-13	W34M @ 40W / 3000K	230612002-S1

Remark (If any)

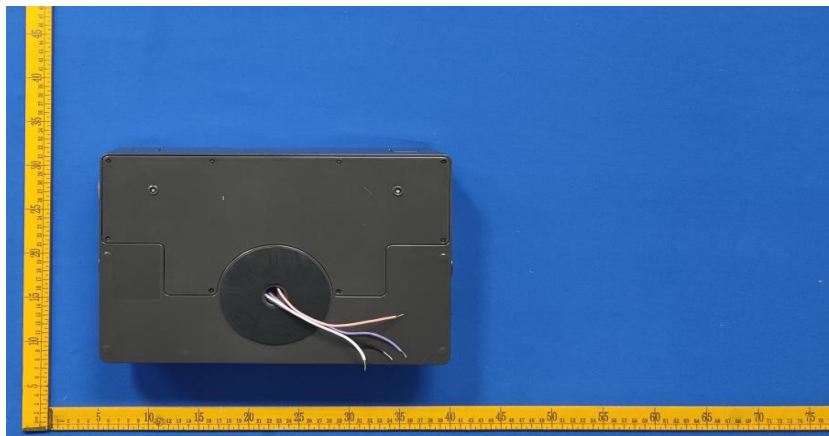
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34M @ 40W / 3000K, 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.	W34M @ 40W / 3000K	Sample ID	230612002-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

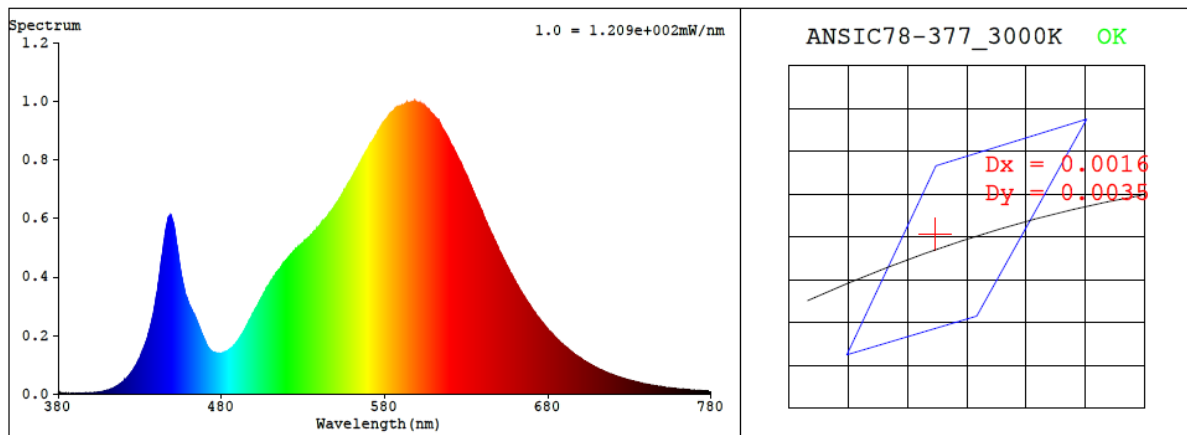
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.358	42.6	0.992
277.0	60	0.182	42.8	0.850

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3122	76.3	-18	0.0012	79	95	-14%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4301$ $y = 0.4045$ / $u' = 0.2460$ $v' = 0.5206$ ($duv=1.18e-03$)

CCT= 3122K Prcp WL: $L_d=581.9nm$ Purity=50.5%

Peak WL: $L_p=599nm$ FWHM: $=123.3nm$ Ratio: $R=21.1\%$ $G=76.7\%$ $B=2.2\%$

Render Index: $R_a = 76.3$ $AvgR = 68.3$ $TM30:R_f=79$ $R_g=94$

EEL: 0.09636 A++ Highest

R1 =73	R2 =85	R3 =95	R4 =74	R5 =73	R6 =80	R7 =81
R8 =50	R9 =-18	R10=66	R11=71	R12=58	R13=75	R14=97 R15=65

4.1 Integrating Sphere Test

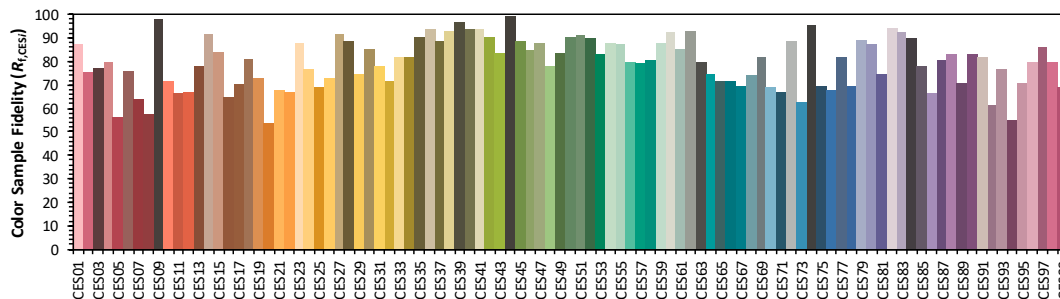
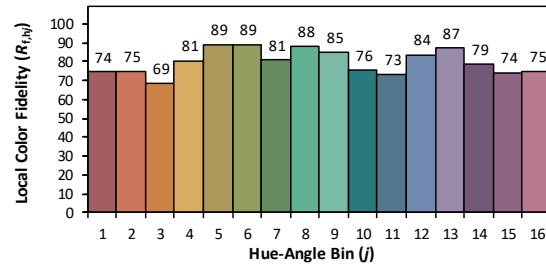
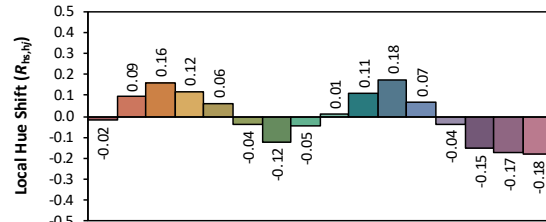
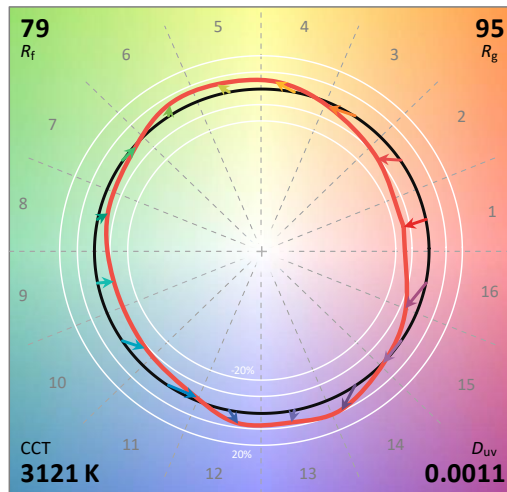
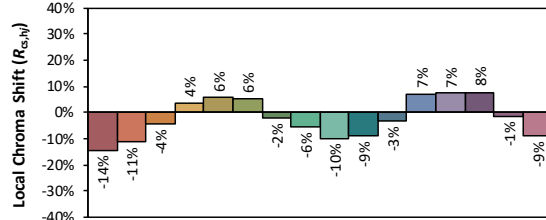
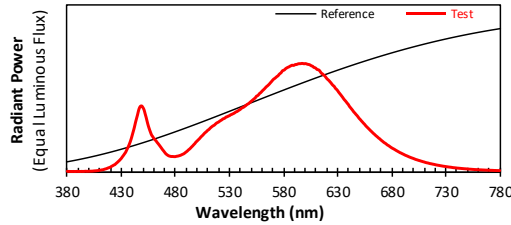
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34M @ 40W / 3000K



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

x 0.4301
 y 0.4044
 u' 0.2460
 v' 0.5205

CIE 13.3-1995
(CRI)

R_a 76
 R_g -18

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	3.80E-06	447	5.93E-04	514	4.17E-04	581	9.39E-04	648	5.18E-04	715	7.62E-05
381	2.30E-06	448	6.04E-04	515	4.23E-04	582	9.49E-04	649	5.05E-04	716	7.39E-05
382	2.40E-06	449	6.04E-04	516	4.29E-04	583	9.55E-04	650	4.91E-04	717	7.21E-05
383	1.90E-06	450	5.90E-04	517	4.38E-04	584	9.61E-04	651	4.81E-04	718	6.96E-05
384	2.00E-06	451	5.70E-04	518	4.47E-04	585	9.65E-04	652	4.69E-04	719	6.80E-05
385	1.90E-06	452	5.33E-04	519	4.53E-04	586	9.71E-04	653	4.58E-04	720	6.56E-05
386	2.40E-06	453	4.98E-04	520	4.58E-04	587	9.76E-04	654	4.47E-04	721	6.32E-05
387	1.60E-06	454	4.57E-04	521	4.66E-04	588	9.81E-04	655	4.37E-04	722	6.12E-05
388	2.40E-06	455	4.20E-04	522	4.72E-04	589	9.79E-04	656	4.24E-04	723	5.92E-05
389	2.80E-06	456	3.90E-04	523	4.78E-04	590	9.81E-04	657	4.14E-04	724	5.78E-05
390	2.00E-06	457	3.62E-04	524	4.86E-04	591	9.87E-04	658	4.04E-04	725	5.56E-05
391	2.40E-06	458	3.37E-04	525	4.90E-04	592	9.87E-04	659	3.94E-04	726	5.39E-05
392	1.90E-06	459	3.23E-04	526	4.95E-04	593	9.91E-04	660	3.84E-04	727	5.21E-05
393	2.80E-06	460	3.07E-04	527	5.04E-04	594	9.94E-04	661	3.74E-04	728	5.04E-05
394	2.50E-06	461	2.95E-04	528	5.06E-04	595	9.95E-04	662	3.65E-04	729	4.91E-05
395	2.50E-06	462	2.85E-04	529	5.13E-04	596	9.95E-04	663	3.54E-04	730	4.74E-05
396	3.30E-06	463	2.71E-04	530	5.16E-04	597	9.97E-04	664	3.46E-04	731	4.60E-05
397	4.30E-06	464	2.59E-04	531	5.24E-04	598	9.96E-04	665	3.36E-04	732	4.46E-05
398	3.50E-06	465	2.46E-04	532	5.27E-04	599	9.94E-04	666	3.28E-04	733	4.30E-05
399	3.70E-06	466	2.32E-04	533	5.33E-04	600	9.95E-04	667	3.20E-04	734	4.20E-05
400	4.10E-06	467	2.19E-04	534	5.37E-04	601	9.94E-04	668	3.10E-04	735	4.08E-05
401	4.20E-06	468	2.05E-04	535	5.43E-04	602	9.90E-04	669	3.03E-04	736	3.91E-05
402	4.90E-06	469	1.92E-04	536	5.51E-04	603	9.88E-04	670	2.93E-04	737	3.75E-05
403	5.00E-06	470	1.80E-04	537	5.54E-04	604	9.86E-04	671	2.85E-04	738	3.66E-05
404	6.10E-06	471	1.67E-04	538	5.61E-04	605	9.80E-04	672	2.77E-04	739	3.55E-05
405	7.30E-06	472	1.58E-04	539	5.68E-04	606	9.74E-04	673	2.69E-04	740	3.43E-05
406	8.00E-06	473	1.51E-04	540	5.74E-04	607	9.71E-04	674	2.63E-04	741	3.30E-05
407	8.80E-06	474	1.45E-04	541	5.83E-04	608	9.61E-04	675	2.56E-04	742	3.23E-05
408	1.02E-05	475	1.43E-04	542	5.89E-04	609	9.58E-04	676	2.47E-04	743	3.13E-05
409	1.10E-05	476	1.40E-04	543	5.94E-04	610	9.52E-04	677	2.41E-04	744	3.04E-05
410	1.36E-05	477	1.40E-04	544	6.01E-04	611	9.42E-04	678	2.35E-04	745	2.93E-05
411	1.46E-05	478	1.40E-04	545	6.08E-04	612	9.39E-04	679	2.27E-04	746	2.86E-05
412	1.69E-05	479	1.39E-04	546	6.17E-04	613	9.34E-04	680	2.21E-04	747	2.74E-05
413	1.82E-05	480	1.39E-04	547	6.23E-04	614	9.22E-04	681	2.15E-04	748	2.68E-05
414	2.14E-05	481	1.42E-04	548	6.29E-04	615	9.08E-04	682	2.09E-04	749	2.60E-05
415	2.47E-05	482	1.43E-04	549	6.38E-04	616	9.01E-04	683	2.04E-04	750	2.52E-05
416	2.73E-05	483	1.46E-04	550	6.47E-04	617	8.92E-04	684	1.97E-04	751	2.43E-05
417	3.13E-05	484	1.49E-04	551	6.55E-04	618	8.84E-04	685	1.92E-04	752	2.33E-05
418	3.55E-05	485	1.52E-04	552	6.64E-04	619	8.72E-04	686	1.86E-04	753	2.28E-05
419	3.87E-05	486	1.57E-04	553	6.72E-04	620	8.59E-04	687	1.80E-04	754	2.21E-05
420	4.31E-05	487	1.62E-04	554	6.81E-04	621	8.49E-04	688	1.75E-04	755	2.13E-05
421	4.97E-05	488	1.67E-04	555	6.95E-04	622	8.40E-04	689	1.71E-04	756	2.07E-05
422	5.47E-05	489	1.75E-04	556	7.00E-04	623	8.28E-04	690	1.65E-04	757	1.98E-05
423	6.12E-05	490	1.82E-04	557	7.09E-04	624	8.17E-04	691	1.61E-04	758	1.94E-05
424	6.52E-05	491	1.90E-04	558	7.21E-04	625	8.04E-04	692	1.55E-04	759	1.88E-05
425	7.49E-05	492	2.00E-04	559	7.29E-04	626	7.93E-04	693	1.50E-04	760	1.82E-05
426	8.31E-05	493	2.08E-04	560	7.40E-04	627	7.85E-04	694	1.46E-04	761	1.74E-05
427	9.26E-05	494	2.18E-04	561	7.50E-04	628	7.69E-04	695	1.42E-04	762	1.71E-05
428	1.02E-04	495	2.28E-04	562	7.59E-04	629	7.59E-04	696	1.37E-04	763	1.69E-05
429	1.12E-04	496	2.38E-04	563	7.70E-04	630	7.48E-04	697	1.33E-04	764	1.62E-05
430	1.23E-04	497	2.49E-04	564	7.81E-04	631	7.33E-04	698	1.29E-04	765	1.58E-05
431	1.38E-04	498	2.59E-04	565	7.89E-04	632	7.20E-04	699	1.26E-04	766	1.53E-05
432	1.51E-04	499	2.73E-04	566	7.98E-04	633	7.08E-04	700	1.22E-04	767	1.47E-05
433	1.65E-04	500	2.82E-04	567	8.08E-04	634	6.95E-04	701	1.18E-04	768	1.43E-05
434	1.80E-04	501	2.92E-04	568	8.20E-04	635	6.81E-04	702	1.14E-04	769	1.38E-05
435	2.01E-04	502	3.01E-04	569	8.31E-04	636	6.67E-04	703	1.11E-04	770	1.33E-05
436	2.21E-04	503	3.13E-04	570	8.43E-04	637	6.55E-04	704	1.08E-04	771	1.31E-05
437	2.44E-04	504	3.24E-04	571	8.53E-04	638	6.44E-04	705	1.04E-04	772	1.26E-05
438	2.70E-04	505	3.33E-04	572	8.60E-04	639	6.30E-04	706	1.02E-04	773	1.25E-05
439	2.99E-04	506	3.44E-04	573	8.68E-04	640	6.19E-04	707	9.84E-05	774	1.19E-05
440	3.34E-04	507	3.55E-04	574	8.77E-04	641	6.02E-04	708	9.56E-05	775	1.13E-05
441	3.70E-04	508	3.63E-04	575	8.84E-04	642	5.90E-04	709	9.23E-05	776	1.13E-05
442	4.07E-04	509	3.72E-04	576	8.97E-04	643	5.78E-04	710	8.98E-05	777	1.07E-05
443	4.50E-04	510	3.83E-04	577	9.05E-04	644	5.65E-04	711	8.64E-05	778	1.06E-05
444	4.88E-04	511	3.89E-04	578	9.14E-04	645	5.51E-04	712	8.35E-05	779	1.04E-05
445	5.25E-04	512	4.00E-04	579	9.29E-04	646	5.41E-04	713	8.12E-05	780	1.04E-05
446	5.66E-04	513	4.09E-04	580	9.33E-04	647	5.28E-04	714	7.92E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34M @ 40W / 3000K	Sample ID	230612002-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	42.1

Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at $25 \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.</p> <p>The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1.0° vertical intervals and 15° horizontal intervals.</p>

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.0	60	0.182	42.8	0.850
NON-WORST CASE	120.0	60	0.358	42.6	0.992

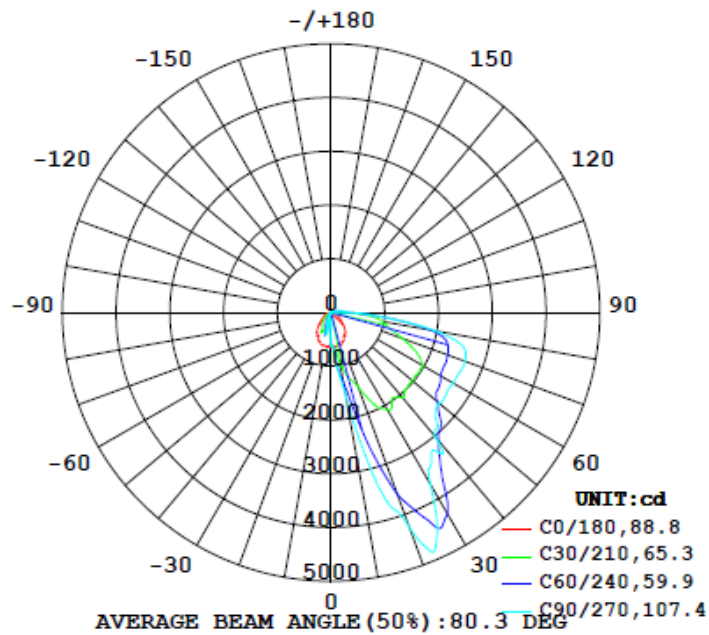
Test Result

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	6174	90.3	124.7	63.5	61.4	144.3	6.6%	B1-U3-G3
0°-90° zones	5965	90.3	124.7	63.5	61.4	139.4	6.9%	B1-U3-G3

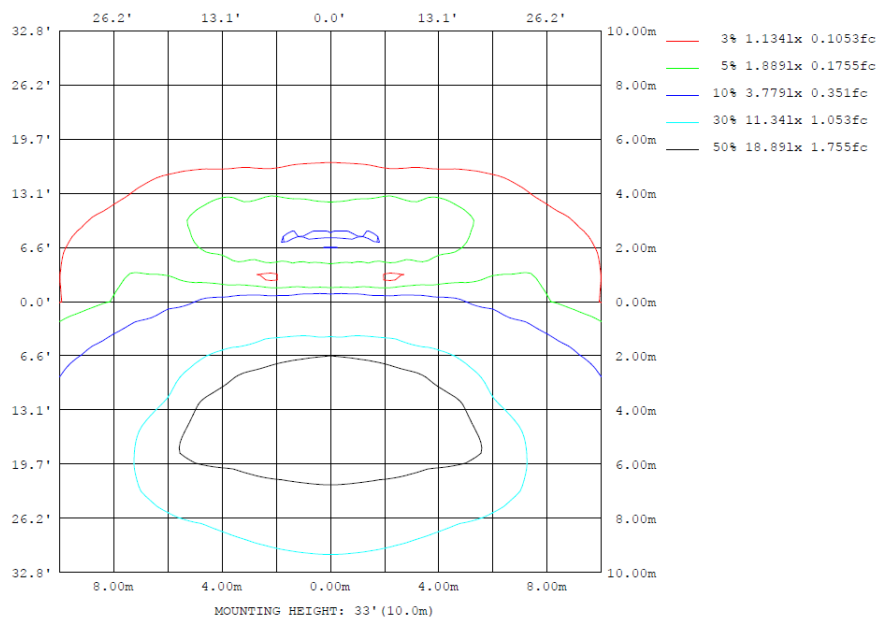
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

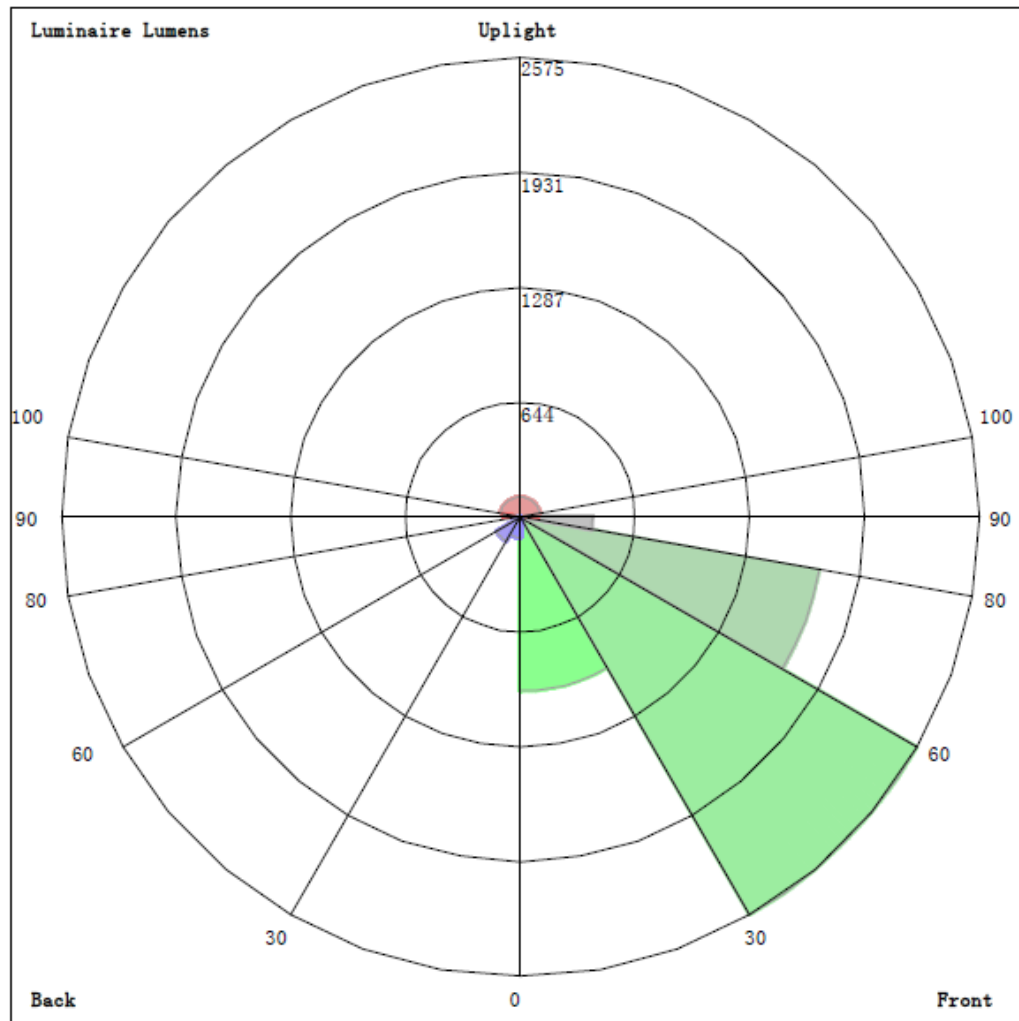
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	lum, lamp
10	638.8	1180	1578	1180	638.8	145.5	302.5	145.5	0- 10	53.35	53.35	0.86,0.86
20	600.8	2399	4243	2399	600.8	432.0	232.8	432.0	10- 20	311.1	364.4	5.9,5.9
30	496.1	3689	3704	3689	496.1	255.7	118.2	255.7	20- 30	725.0	1089	17.6,17.6
40	399.0	3755	3012	3755	399.0	149.9	44.54	149.9	30- 40	897.6	1987	32.2,32.2
50	253.5	2647	2620	2647	253.5	63.96	7.820	63.96	40- 50	926.6	2914	47.2,47.2
60	166.9	2132	2621	2132	166.9	25.11	1.843	25.11	50- 60	905.5	3819	61.9,61.9
70	105.1	1990	2650	1990	105.1	14.08	0.5318	14.08	60- 70	904.7	4724	76.5,76.5
80	39.79	1774	1974	1774	39.79	10.67	1.296	10.67	70- 80	831.5	5555	90,90
90	11.73	346.5	386.7	346.5	11.73	6.926	2.048	6.926	80- 90	410.1	5965	96.6,96.6
100	8.216	133.4	203.3	133.4	8.216	3.818	2.462	3.818	90-100	96.70	6062	98.2,98.2
110	6.213	63.71	91.22	63.71	6.213	3.483	2.547	3.483	100-110	46.49	6109	98.9,98.9
120	4.668	51.82	64.41	51.82	4.668	3.273	2.507	3.273	110-120	26.00	6135	99.4,99.4
130	3.623	37.16	52.13	37.16	3.623	3.137	2.819	3.137	120-130	18.11	6153	99.6,99.6
140	2.813	20.66	44.88	20.66	2.813	2.797	2.897	2.797	130-140	12.54	6165	99.9,99.9
150	2.180	11.43	20.87	11.43	2.180	2.427	2.616	2.427	140-150	5.835	6171	99.9,99.9
160	1.674	5.500	9.291	5.500	1.674	2.240	1.917	2.240	150-160	2.526	6174	100,100
170	1.351	0.9989	1.125	0.9989	1.351	1.639	1.140	1.639	160-170	0.7198	6174	100,100
180	1.540	1.388	1.261	1.388	1.540	1.469	1.238	1.469	170-180	0.1226	6174	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	53.35	0-10	53.35	0.86%
10-20	311.08	0-20	364.43	5.90%
20-30	725.00	0-30	1089.43	17.64%
30-40	897.59	0-40	1987.02	32.18%
40-50	926.59	0-50	2913.61	47.19%
50-60	905.52	0-60	3819.13	61.85%
60-70	904.72	0-70	4723.85	76.51%
70-80	831.55	0-80	5555.40	89.97%
80-90	410.06	0-90	5965.46	96.62%
90-100	96.70	0-100	6062.16	98.18%
100-110	46.49	0-110	6108.65	98.94%
110-120	26.00	0-120	6134.65	99.36%
120-130	18.11	0-130	6152.76	99.65%
130-140	12.54	0-140	6165.30	99.85%
140-150	5.84	0-150	6171.14	99.95%
150-160	2.53	0-160	6173.67	99.99%
160-170	0.72	0-170	6174.39	100.00%
170-180	0.12	0-180	6174.51	100.00%

4.2 Goniophotometer Test

LCS/BUG

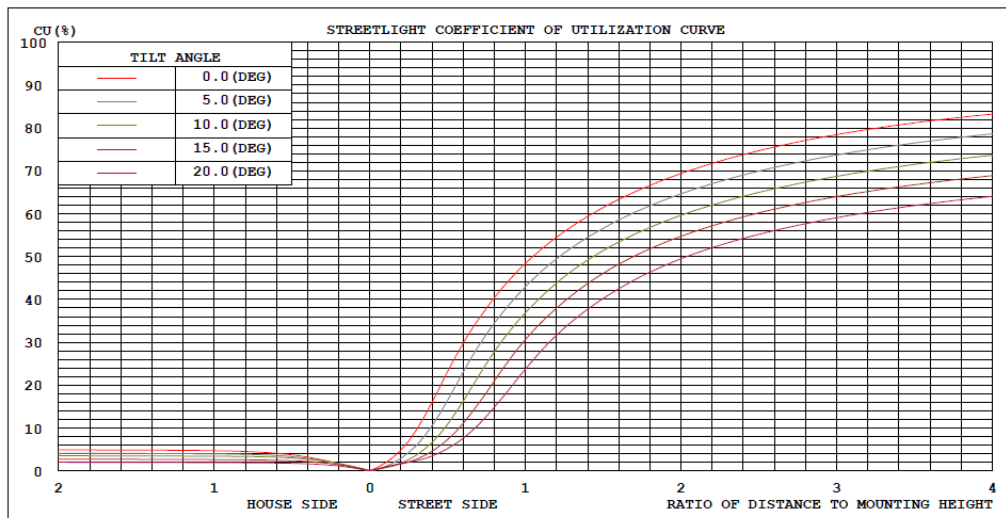


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

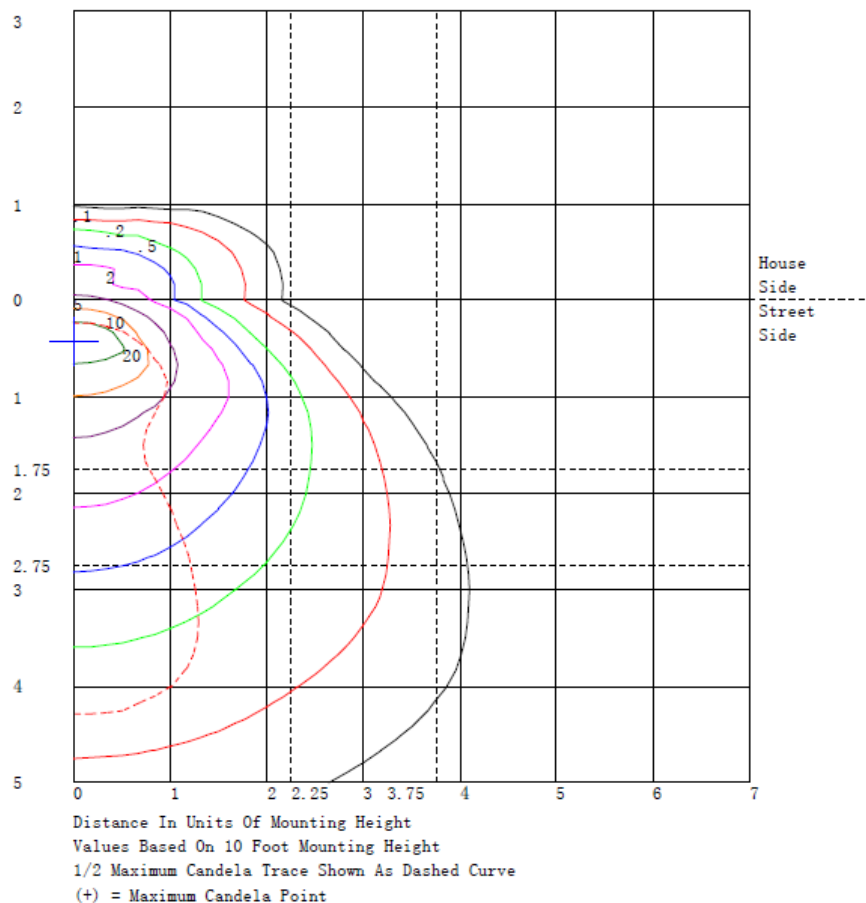
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	975.1	N.A.	15.8
FM - Front-Medium (30-60)	2574.6	N.A.	41.7
FH - Front-High (60-80)	1702.8	N.A.	27.6
FVH - Front-Very High (80-90)	404.0	N.A.	6.5
BL - Back-Low (0-30)	114.3	N.A.	1.9
BM - Back-Medium (30-60)	155.1	N.A.	2.5
BH - Back-High (60-80)	33.5	N.A.	0.5
BVH - Back-Very High (80-90)	6.0	N.A.	0.1
UL - Uplight-Low (90-100)	96.7	N.A.	1.6
UH - Uplight-High (100-180)	112.3	N.A.	1.8
Total	6174.4	N.A.	100.0
BUG Rating	B1-U3-G3		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1 UNIT: cd

C (DEG) γ (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	623	623	623	623	622	622	622	622	622	623	623	624	625	625	625	625	626	627	628
5	626	619	616	617	621	630	644	665	691	718	744	769	794	819	842	863	878	888	894
10	639	626	639	678	757	851	951	1035	1112	1180	1232	1277	1319	1367	1414	1460	1511	1552	1578
15	641	681	745	834	961	1103	1250	1359	1477	1620	1841	2085	2338	2580	2803	2997	3140	3236	3281
20	601	742	885	1031	1155	1299	1479	1743	2052	2399	2816	3226	3593	3813	3968	4074	4166	4223	4243
25	570	721	899	1104	1327	1585	1883	2260	2668	3089	3519	3919	4264	4483	4628	4709	4713	4684	4647
30	496	675	889	1138	1404	1718	2090	2631	3184	3689	4014	4228	4326	4234	4072	3889	3796	3734	3704
35	457	659	882	1125	1347	1620	1977	2650	3318	3862	3897	3771	3566	3462	3369	3293	3261	3249	3250
40	399	625	871	1139	1401	1705	2071	2701	3301	3755	3646	3391	3106	3106	3151	3203	3138	3066	3012
45	310	582	857	1136	1405	1687	1992	2422	2824	3134	3136	3041	2906	2868	2841	2819	2787	2761	2747
50	254	508	775	1055	1367	1678	1974	2251	2481	2647	2664	2629	2573	2572	2578	2588	2599	2610	2620
55	204	376	597	867	1243	1625	1971	2159	2283	2358	2404	2429	2445	2481	2516	2550	2581	2605	2620
60	167	289	483	749	1171	1602	1977	2091	2129	2132	2205	2281	2355	2416	2470	2517	2563	2599	2621
65	134	226	390	624	1001	1395	1751	1906	1998	2057	2151	2241	2328	2415	2494	2560	2602	2627	2636
70	105	161	282	468	766	1093	1415	1642	1833	1990	2115	2219	2310	2411	2502	2576	2619	2643	2650
75	70.6	104	195	343	572	839	1128	1421	1697	1936	2071	2166	2240	2337	2423	2494	2534	2556	2563
80	39.8	64.3	141	270	470	709	972	1268	1545	1774	1854	1881	1878	1903	1923	1940	1953	1965	1974
85	23.0	45.1	103	197	352	524	694	827	932	1004	1007	985	955	957	962	969	965	960	958
90	11.7	30.2	58.2	95.5	151	209	264	301	328	347	349	347	344	353	364	375	380	384	387
95	8.59	18.1	32.2	50.7	76.3	104	133	162	187	207	212	213	213	221	231	240	243	244	244
100	8.22	15.7	25.2	36.7	50.9	66.5	83.1	101	118	133	145	155	164	176	187	196	201	203	203
105	7.47	14.3	21.7	29.6	38.3	47.4	56.5	65.3	74.0	82.3	89.3	96.4	104	116	127	137	142	145	146
110	6.21	10.6	15.7	21.6	28.8	36.4	44.1	51.2	57.8	63.7	68.0	71.7	75.4	80.5	85.4	89.5	90.9	91.4	91.2
115	5.43	9.41	13.8	18.6	23.9	29.6	35.7	42.7	49.5	55.6	59.2	61.9	64.3	68.0	71.5	74.2	74.7	74.4	73.8
120	4.67	8.35	12.1	16.0	19.6	23.6	28.4	36.5	44.7	51.8	53.8	54.4	54.8	57.9	61.1	63.9	64.7	64.7	64.4
125	4.04	6.83	9.80	13.0	16.0	19.4	23.6	30.2	37.1	43.4	47.0	49.5	51.4	53.3	54.7	55.7	55.8	55.6	55.3
130	3.62	4.99	6.96	9.54	12.8	16.6	20.9	26.1	31.7	37.2	42.5	47.3	51.0	52.6	53.1	53.0	52.8	52.5	52.1
135	3.23	3.56	4.79	6.94	10.5	14.5	18.8	22.3	25.7	29.2	33.3	37.5	41.7	46.5	50.7	54.0	54.5	54.1	53.2
140	2.81	2.54	3.27	5.00	8.52	12.4	16.2	17.9	19.3	20.7	23.1	25.9	28.9	32.0	35.2	38.2	41.1	43.5	44.9
145	2.48	1.55	1.65	2.78	5.75	9.14	12.4	13.4	14.1	14.9	17.1	19.5	21.7	23.0	24.0	24.8	25.8	26.5	27.0
150	2.18	1.55	1.54	2.15	3.75	5.70	7.72	8.96	10.1	11.4	13.5	15.6	17.5	18.2	18.7	19.0	19.7	20.4	20.9
155	1.91	1.58	1.54	1.80	2.39	3.25	4.33	5.61	7.05	8.63	10.6	12.4	13.9	14.1	13.9	13.6	13.7	14.0	14.2
160	1.67	1.61	1.57	1.55	1.38	1.36	1.63	2.72	4.06	5.50	6.77	7.89	8.79	9.16	9.32	9.32	9.33	9.30	9.29
165	1.44	1.43	1.40	1.36	1.26	1.18	1.16	1.26	1.48	1.84	2.50	3.24	3.96	4.44	4.81	5.10	5.27	5.38	5.44
170	1.35	1.33	1.30	1.27	1.23	1.18	1.14	1.09	1.04	1.00	0.96	0.92	0.89	0.87	0.86	0.87	0.95	1.04	1.12
175	1.42	1.41	1.40	1.38	1.35	1.33	1.30	1.27	1.24	1.21	1.17	1.14	1.11	1.08	1.06	1.04	1.02	1.01	1.02
180	1.54	1.54	1.53	1.52	1.51	1.49	1.46	1.44	1.41	1.39	1.36	1.33	1.30	1.28	1.25	1.24	1.24	1.25	1.26

																			UNIT: cd	
γ	C (DEG)																			
	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	
0	627	626	625	625	625	625	624	623	623	622	622	622	622	622	623	623	623	623	627	
5	888	878	863	842	819	794	769	744	718	691	665	644	630	621	617	616	619	626	573	
10	1552	1511	1460	1414	1367	1319	1277	1232	1180	1112	1035	951	851	757	678	639	626	639	457	
15	3236	3140	2997	2803	2580	2338	2085	1841	1620	1477	1359	1250	1103	961	834	745	681	641	418	
20	4223	4166	4074	3968	3813	3593	3226	2816	2399	2052	1743	1479	1299	1155	1031	885	742	601	371	
25	4684	4713	4709	4628	4483	4264	3919	3519	3089	2668	2260	1883	1585	1327	1104	899	721	570	355	
30	3734	3796	3889	4072	4234	4326	4228	4014	3689	3184	2631	2090	1718	1404	1138	889	675	496	357	
35	3249	3261	3293	3369	3462	3566	3771	3897	3862	3318	2650	1977	1620	1347	1125	882	659	457	383	
40	3066	3138	3203	3151	3106	3106	3391	3646	3755	3301	2701	2071	1705	1401	1139	871	625	399	368	
45	2761	2787	2819	2841	2868	2906	3041	3136	3134	2824	2422	1992	1687	1405	1136	857	582	310	323	
50	2610	2599	2588	2578	2572	2573	2629	2664	2647	2481	2251	1974	1678	1367	1055	775	508	254	258	
55	2605	2581	2550	2516	2481	2445	2429	2404	2358	2283	2159	1971	1625	1243	867	597	376	204	211	
60	2599	2563	2517	2470	2416	2355	2281	2205	2132	2129	2091	1977	1602	1171	749	483	289	167	173	
65	2627	2602	2560	2494	2415	2328	2241	2151	2057	1998	1906	1751	1395	1001	624	390	226	134	138	
70	2643	2619	2576	2502	2411	2310	2219	2115	1990	1833	1642	1415	1093	766	468	282	161	105	98.6	
75	2556	2534	2494	2423	2337	2240	2166	2071	1936	1697	1421	1128	839	572	343	195	104	70.6	63.0	
80	1965	1953	1940	1923	1903	1878	1881	1854	1774	1545	1268	972	709	470	270	141	64.3	39.8	36.7	
85	960	965	969	962	957	955	985	1007	1004	932	827	694	524	352	197	103	45.1	23.0	24.9	
90	384	380	375	364	353	344	347	349	347	328	301	264	209	151	95.5	58.2	30.2	11.7	12.5	
95	244	243	240	231	221	213	213	212	207	187	162	133	104	76.3	50.7	32.2	18.1	8.59	9.00	
100	203	201	196	187	176	164	155	145	133	118	101	83.1	66.5	50.9	36.7	25.2	15.7	8.22	7.85	
105	145	142	137	127	116	104	96.4	89.3	82.3	74.0	65.3	56.5	47.4	38.3	29.6	21.7	14.3	7.47	7.03	
110	91.4	90.9	89.5	85.4	80.5	75.4	71.7	68.0	63.7	57.8	51.2	44.1	36.4	28.8	21.6	15.7	10.6	6.21	6.12	
115	74.4	74.7	74.2	71.5	68.0	64.3	61.9	59.2	55.6	49.5	42.7	35.7	29.6	23.9	18.6	13.8	9.41	5.43	5.57	
120	64.7	64.7	63.9	61.1	57.9	54.8	54.4	53.8	51.8	44.7	36.5	28.4	23.6	19.6	16.0	12.1	8.35	4.67	5.19	
125	55.6	55.8	55.7	54.7	53.3	51.4	49.5	47.0	43.4	37.1	30.2	23.6	19.4	16.0	13.0	9.80	6.83	4.04	4.88	
130	52.5	52.8	53.0	53.1	52.6	51.0	47.3	42.5	37.2	31.7	26.1	20.9	16.6	12.8	9.54	6.96	4.99	3.62	3.80	
135	54.1	54.5	54.0	50.7	46.5	41.7	37.5	33.3	29.2	25.7	22.3	18.8	14.5	10.5	6.94	4.79	3.56	3.23	3.37	
140	43.5	41.1	38.2	35.2	32.0	28.9	25.9	23.1	20.7	19.3	17.9	16.2	14.2	8.52	5.00	3.27	2.54	2.81	3.06	
145	26.5	25.8	24.8	24.0	23.0	21.7	19.5	17.1	14.9	14.1	13.4	12.4	9.14	5.75	2.78	1.65	1.55	2.48	2.71	
150	20.4	19.7	19.0	18.7	18.2	17.5	15.6	13.5	11.4	10.1	8.96	7.72	5.70	3.75	2.15	1.54	1.55	2.18	2.42	
155	14.0	13.7	13.6	13.9	14.1	13.9	12.4	10.6	8.63	7.05	5.61	4.33	3.25	2.39	1.80	1.54	1.58	1.91	2.22	
160	9.30	9.33	9.32	9.32	9.16	8.79	7.89	6.77	5.50	4.06	2.72	1.63	1.36	1.38	1.55	1.57	1.61	1.67	1.93	
165	5.38	5.27	5.10	4.81	4.44	3.96	3.24	2.50	1.84	1.48	1.26	1.16	1.18	1.26	1.36	1.40	1.43	1.44	1.71	
170	1.04	0.95	0.87	0.86	0.87	0.89	0.92	0.96	1.00	1.04	1.09	1.14	1.18	1.23	1.27	1.30	1.33	1.35	1.81	
175	1.01	1.02	1.04	1.06	1.08	1.11	1.14	1.17	1.21	1.24	1.27	1.30	1.33	1.35	1.38	1.40	1.41	1.42	1.85	
180	1.25	1.24	1.24	1.25	1.28	1.30	1.33	1.36	1.39	1.41	1.44	1.46	1.49	1.51	1.52	1.53	1.54	1.54	1.81	

Table--3

UNIT: °C

C (DBG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	630	633	633	632	631	631	631	631	631	631	630	630	629	628	628	628	628	628	628
5	513	447	365	284	214	179	158	147	138	135	134	132	131	130	129	129	129	129	129
10	314	211	159	137	134	130	134	145	166	190	214	231	245	259	278	293	303	293	278
15	253	146	116	132	179	245	316	381	403	412	413	421	426	427	414	399	388	399	414
20	216	135	167	245	340	389	421	432	395	344	291	268	254	245	238	234	233	234	238
25	215	149	209	305	399	381	338	286	265	248	233	211	190	173	169	170	172	170	169
30	263	212	233	278	323	313	288	256	226	196	169	150	135	124	119	118	118	118	119
35	328	291	287	292	295	268	235	199	168	141	120	115	115	118	113	109	106	109	113
40	338	311	289	267	244	213	181	150	125	103	84.8	68.6	55.9	46.8	43.7	43.3	44.5	43.3	43.7
45	323	310	278	237	195	165	138	112	86.4	63.4	44.5	34.5	28.7	25.9	23.3	22.2	22.2	22.2	23.3
50	254	242	216	186	152	120	90.4	64.0	45.6	31.8	21.9	15.5	11.7	9.83	8.32	7.72	7.82	7.72	8.32
55	209	198	174	144	111	82.5	56.6	35.1	23.5	16.4	12.3	8.43	5.92	4.49	3.75	3.59	3.82	3.59	3.75
60	171	160	136	108	78.5	57.1	39.2	25.1	16.8	11.7	8.64	5.61	3.55	2.30	1.74	1.65	1.84	1.65	1.74
65	134	124	100	73.3	47.6	34.1	24.7	18.4	13.2	9.49	6.85	4.22	2.23	0.86	0.41	0.40	0.64	0.40	0.41
70	90.0	79.2	63.9	48.2	33.6	25.0	18.6	14.1	10.4	7.59	5.50	3.38	1.71	0.54	0.23	0.29	0.53	0.29	0.23
75	55.4	47.8	39.6	31.8	24.7	19.4	15.1	11.7	8.96	6.82	5.09	3.33	1.90	0.88	0.62	0.67	0.88	0.67	0.62
80	33.4	30.1	26.4	22.8	19.3	16.2	13.3	10.7	8.35	6.33	4.61	3.16	2.05	1.28	1.08	1.13	1.30	1.13	1.08
85	25.5	24.8	22.2	18.9	15.4	13.1	11.1	9.29	7.40	5.69	4.20	3.07	2.23	1.66	1.52	1.56	1.69	1.56	1.52
90	12.9	12.8	12.0	10.9	9.67	8.78	7.88	6.93	5.67	4.43	3.32	2.68	2.25	2.01	1.94	1.97	2.05	1.97	1.94
95	9.09	8.86	8.13	7.22	6.26	5.57	4.94	4.35	3.69	3.10	2.61	2.38	2.27	2.24	2.24	2.26	2.29	2.26	2.24
100	7.42	6.94	6.36	5.76	5.16	4.68	4.24	3.82	3.35	2.93	2.60	2.46	2.41	2.41	2.42	2.44	2.46	2.44	2.42
105	6.58	6.12	5.61	5.10	4.62	4.26	3.94	3.63	3.27	2.94	2.67	2.56	2.52	2.53	2.54	2.56	2.57	2.56	2.54
110	5.94	5.66	5.21	4.73	4.26	3.97	3.72	3.48	3.18	2.89	2.66	2.56	2.53	2.52	2.53	2.54	2.55	2.54	2.53
115	5.56	5.40	4.99	4.50	4.02	3.77	3.58	3.40	3.12	2.86	2.64	2.55	2.52	2.51	2.51	2.52	2.52	2.52	2.51
120	5.45	5.44	5.00	4.41	3.82	3.57	3.41	3.27	3.04	2.82	2.64	2.56	2.52	2.51	2.51	2.51	2.51	2.51	2.51
125	5.36	5.48	5.03	4.38	3.71	3.46	3.31	3.21	3.02	2.85	2.72	2.67	2.65	2.65	2.64	2.64	2.63	2.64	2.64
130	3.91	3.94	3.87	3.74	3.59	3.44	3.29	3.14	2.99	2.87	2.78	2.77	2.79	2.82	2.82	2.82	2.82	2.82	2.82
135	3.47	3.52	3.50	3.44	3.35	3.24	3.12	3.00	2.89	2.81	2.76	2.78	2.83	2.88	2.90	2.92	2.92	2.92	2.90
140	3.18	3.26	3.22	3.14	3.03	2.95	2.87	2.80	2.74	2.70	2.68	2.72	2.78	2.84	2.87	2.89	2.90	2.89	2.87
145	2.92	3.02	3.01	2.94	2.84	2.75	2.66	2.59	2.56	2.56	2.57	2.62	2.68	2.74	2.78	2.81	2.81	2.81	2.78
150	2.68	2.79	2.77	2.68	2.57	2.51	2.46	2.43	2.43	2.44	2.47	2.50	2.54	2.58	2.61	2.62	2.62	2.62	2.61
155	2.44	2.57	2.55	2.47	2.38	2.34	2.31	2.30	2.28	2.27	2.28	2.30	2.33	2.34	2.32	2.29	2.25	2.29	2.32
160	2.21	2.35	2.35	2.30	2.23	2.23	2.24	2.24	2.20	2.16	2.12	2.11	2.10	2.08	2.03	1.97	1.92	1.97	2.03
165	1.95	2.09	2.12	2.11	2.06	2.06	2.05	2.03	1.98	1.92	1.86	1.79	1.73	1.67	1.62	1.58	1.55	1.58	1.62
170	1.73	1.83	1.85	1.84	1.79	1.75	1.70	1.64	1.55	1.45	1.35	1.26	1.19	1.14	1.13	1.13	1.14	1.13	1.13
175	1.65	1.71	1.73	1.73	1.69	1.63	1.54	1.45	1.39	1.33	1.28	1.23	1.19	1.16	1.16	1.17	1.18	1.17	1.16
180	1.50	1.49	1.49	1.49	1.50	1.50	1.49	1.47	1.43	1.38	1.33	1.29	1.26	1.24	1.23	1.23	1.24	1.23	1.23

																UNIT: °C			
y	C (DEG)																		
		285	290	295	300	305	310	315	320	325	330	335	340	345	350	355			
	0	628	629	630	630	631	631	631	631	631	632	633	633	630	627				
	5	130	131	132	134	135	138	147	158	179	214	284	365	447	513	573			
	10	259	245	231	214	190	166	145	134	130	134	137	159	211	314	457			
	15	427	426	421	413	412	403	381	316	245	179	132	116	146	253	418			
	20	245	254	268	291	344	395	432	421	389	340	245	167	135	216	371			
	25	173	190	211	233	248	265	286	338	381	399	305	209	149	215	355			
	30	124	135	150	169	196	226	256	288	313	323	278	233	212	263	357			
	35	118	115	115	120	141	168	199	235	268	295	292	287	291	328	383			
	40	46.8	55.9	68.6	84.8	103	125	150	181	213	244	267	289	311	338	368			
	45	25.9	28.7	34.5	44.5	63.4	86.4	112	138	165	195	237	278	310	323	323			
	50	9.83	11.7	15.5	21.9	31.8	45.6	64.0	90.4	120	152	186	216	242	254	258			
	55	4.49	5.92	8.43	12.3	16.4	23.5	35.1	56.6	82.5	111	144	174	198	209	211			
	60	2.30	3.55	5.61	8.64	11.7	16.8	25.1	39.2	57.1	78.5	108	136	160	171	173			
	65	0.86	2.23	4.22	6.85	9.49	13.2	18.4	24.7	34.1	47.6	73.3	100	124	134	138			
	70	0.54	1.71	3.38	5.50	7.59	10.4	14.1	18.6	25.0	33.6	48.2	63.9	79.2	90.0	98.6			
	75	0.88	1.90	3.33	5.09	6.82	8.96	11.7	15.1	19.4	24.7	31.8	39.6	47.8	55.4	63.0			
	80	1.28	2.05	3.16	4.61	6.33	8.35	10.7	13.3	16.2	19.3	22.8	26.4	30.1	33.4	36.7			
	85	1.66	2.23	3.07	4.20	5.69	7.40	9.29	11.1	13.1	15.4	18.9	22.2	24.8	25.5	24.9			
	90	2.01	2.25	2.68	3.32	4.43	5.67	6.93	7.88	8.78	9.67	10.9	12.0	12.8	12.9	12.5			
	95	2.24	2.27	2.38	2.61	3.10	3.69	4.35	4.94	5.57	6.26	7.22	8.13	8.86	9.09	9.00			
	100	2.41	2.41	2.46	2.60	2.93	3.35	3.82	4.24	4.68	5.16	5.76	6.36	6.94	7.42	7.85			
	105	2.53	2.52	2.56	2.67	2.94	3.27	3.63	3.94	4.26	4.62	5.10	5.61	6.12	6.58	7.03			
	110	2.52	2.53	2.56	2.66	2.89	3.18	3.48	3.72	3.97	4.26	4.73	5.21	5.66	6.14	6.12			
	115	2.51	2.52	2.55	2.64	2.86	3.12	3.40	3.58	3.77	4.02	4.50	4.99	5.40	5.56	5.57			
	120	2.51	2.52	2.56	2.64	2.82	3.04	3.27	3.41	3.57	3.82	4.41	5.00	5.44	5.45	5.19			
	125	2.65	2.65	2.67	2.72	2.85	3.02	3.21	3.31	3.46	3.71	4.38	5.03	5.48	5.36	4.88			
	130	2.82	2.79	2.77	2.78	2.87	2.99	3.14	3.29	3.44	3.59	3.74	3.87	3.94	3.91	3.80			
	135	2.88	2.83	2.78	2.76	2.81	2.89	3.00	3.12	3.24	3.35	3.44	3.50	3.52	3.47	3.37			
	140	2.84	2.78	2.72	2.68	2.70	2.74	2.80	2.87	2.95	3.03	3.14	3.22	3.26	3.18	3.04			
	145	2.74	2.68	2.62	2.57	2.56	2.56	2.59	2.66	2.75	2.84	2.94	3.01	3.02	2.92	2.74			
	150	2.58	2.54	2.50	2.47	2.44	2.43	2.43	2.46	2.51	2.57	2.68	2.77	2.79	2.68	2.48			
	155	2.34	2.33	2.30	2.28	2.27	2.28	2.30	2.31	2.34	2.38	2.47	2.55	2.57	2.44	2.22			
	160	2.08	2.10	2.11	2.12	2.16	2.20	2.24	2.24	2.23	2.23	2.30	2.35	2.35	2.21	1.99			
	165	1.67	1.73	1.79	1.86	1.92	1.98	2.03	2.05	2.06	2.06	2.11	2.12	2.09	1.95	1.73			
	170	1.14	1.19	1.26	1.35	1.45	1.55	1.64	1.70	1.75	1.79	1.84	1.85	1.83	1.73	1.57			
	175	1.16	1.19	1.23	1.28	1.33	1.39	1.45	1.54	1.63	1.69	1.73	1.73	1.71	1.65	1.51			
	180	1.24	1.26	1.29	1.33	1.38	1.43	1.47	1.49	1.50	1.50	1.49	1.49	1.49	1.50	1.51			

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34M @ 40W / 3000K	Sample ID	230612002-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	0.358	42.6	0.992	2.43
277.0	60	0.182	42.8	0.850	12.52

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*****