

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: 2023-11-16

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		8386
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		145.1
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		8186
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	141.6
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		57.8
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.13
			277V	10.44
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.996
			277V	0.913
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5301
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		82.8
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		8
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		83
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		96
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-13%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		2.8%
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		0.484
(Goniophotometer – Section 4.2)		Non-Worst Case		0.225
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		57.8
(Goniophotometer – Section 4.2)		Non-Worst Case		56.8

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-11-02	WPX2 @ 60W / 5000K	231101003-S1
2	Goniophotometer Test	2023-11-02	WPX2 @ 60W / 5000K	231101003-S1
3	THD and PF Test	2023-11-02	WPX2 @ 60W / 5000K	231101003-S1

Remark (If any)

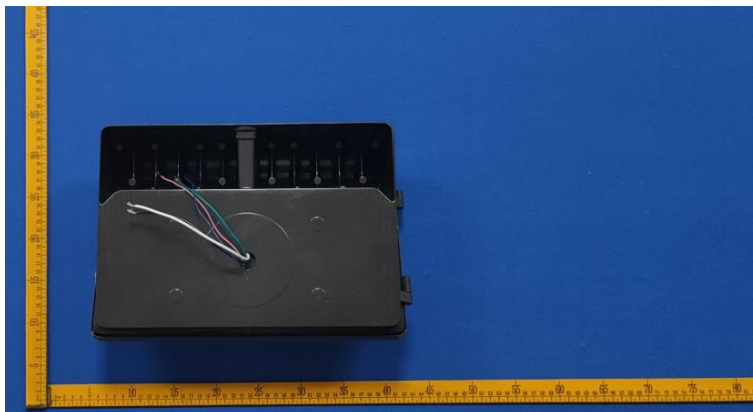
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. WPX2 @ 60W / 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.	WPX2 @ 60W / 5000K	Sample ID	231101003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

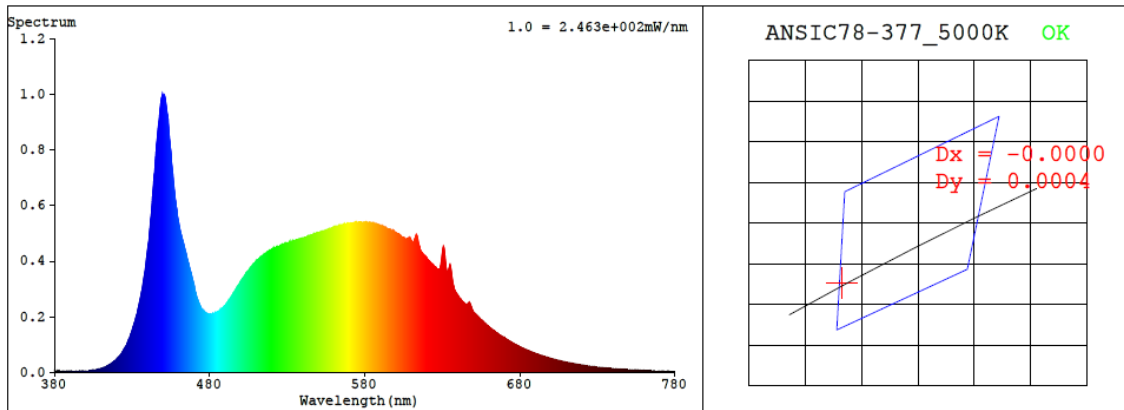
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.484	57.8	0.996
277.0	60	0.225	56.8	0.913

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5301	82.8	8	0.0002	83	96	-13%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3372$ $y = 0.3456$ / $u' = 0.2084$ $v' = 0.4805$ ($duv=2.37e-04$)

CCT= 5301K Prop WL: $L_d=565.5nm$ Purity=4.8%

Peak WL: $L_p=450nm$ FWHM: $\approx 20.3nm$ Ratio: $R=15.2\%$ $G=80.1\%$ $B=4.6\%$

Render Index: $R_a = 82.8$ $AvgR = 75.9$ $TM30:R_f=82$ $R_g=96$

EEL: 0.09495 A++ Highest

$R_1=81$ $R_2=87$ $R_3=91$ $R_4=83$ $R_5=82$ $R_6=82$ $R_7=86$

$R_8=68$ $R_9=8$ $R_{10}=70$ $R_{11}=83$ $R_{12}=62$ $R_{13}=83$ $R_{14}=95$ $R_{15}=77$

4.1 Integrating Sphere Test

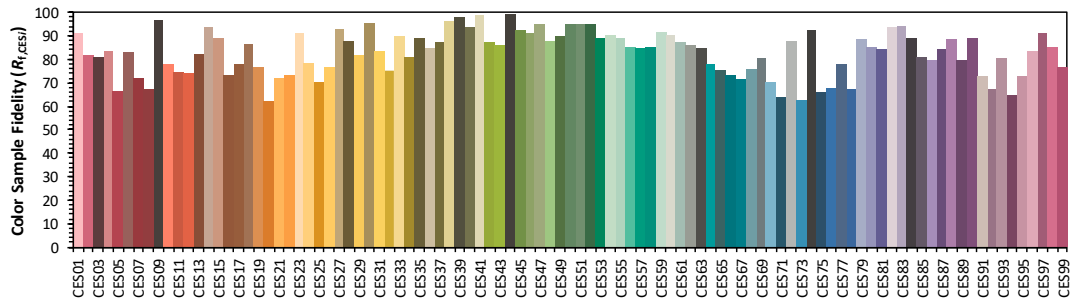
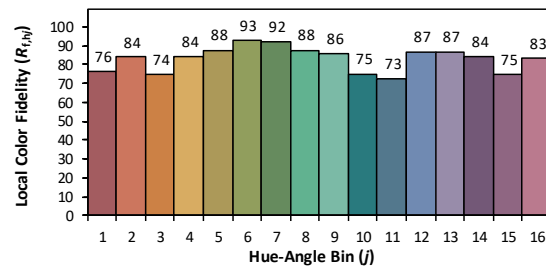
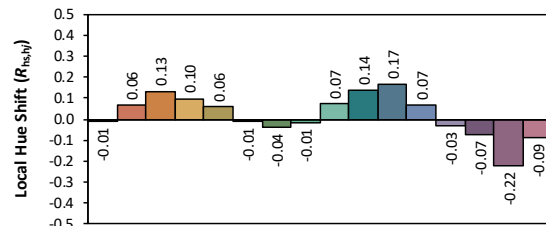
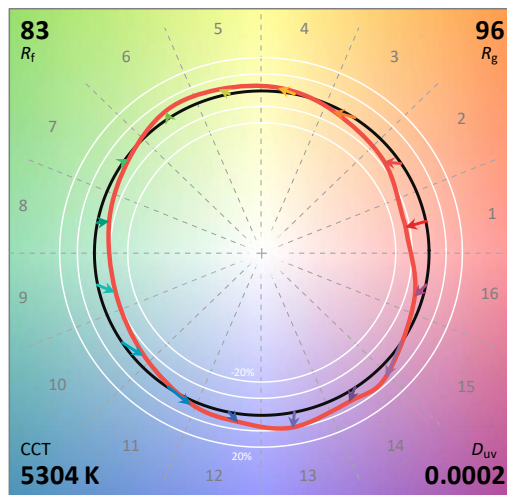
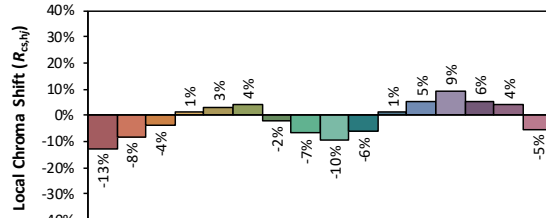
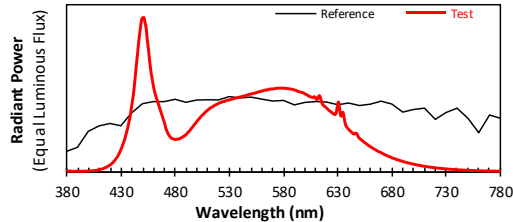
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/11/16

Model: WPX2 @ 60W / 5000K



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

x 0.3371
 y 0.3454
 u' 0.2084
 v' 0.4804

CIE 13.3-1995
(CRI)

R_a 83
 R_g 8

4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	6.70E-06	447	8.92E-04	514	4.18E-04	581	5.40E-04	648	2.44E-04	715	3.14E-05
381	4.00E-06	448	9.47E-04	515	4.22E-04	582	5.37E-04	649	2.28E-04	716	3.00E-05
382	5.90E-06	449	9.87E-04	516	4.28E-04	583	5.38E-04	650	2.18E-04	717	2.93E-05
383	5.60E-06	450	9.94E-04	517	4.31E-04	584	5.37E-04	651	2.12E-04	718	2.83E-05
384	3.70E-06	451	9.93E-04	518	4.35E-04	585	5.36E-04	652	2.07E-04	719	2.74E-05
385	3.30E-06	452	9.59E-04	519	4.38E-04	586	5.34E-04	653	2.01E-04	720	2.67E-05
386	3.40E-06	453	9.23E-04	520	4.42E-04	587	5.33E-04	654	1.95E-04	721	2.58E-05
387	3.90E-06	454	8.49E-04	521	4.46E-04	588	5.33E-04	655	1.89E-04	722	2.48E-05
388	3.70E-06	455	7.95E-04	522	4.47E-04	589	5.31E-04	656	1.85E-04	723	2.43E-05
389	4.10E-06	456	7.26E-04	523	4.51E-04	590	5.28E-04	657	1.79E-04	724	2.34E-05
390	4.00E-06	457	6.66E-04	524	4.53E-04	591	5.27E-04	658	1.74E-04	725	2.25E-05
391	4.70E-06	458	6.19E-04	525	4.53E-04	592	5.25E-04	659	1.69E-04	726	2.19E-05
392	3.60E-06	459	5.79E-04	526	4.57E-04	593	5.20E-04	660	1.65E-04	727	2.14E-05
393	3.50E-06	460	5.41E-04	527	4.58E-04	594	5.18E-04	661	1.60E-04	728	2.08E-05
394	4.40E-06	461	5.11E-04	528	4.62E-04	595	5.16E-04	662	1.55E-04	729	1.98E-05
395	4.20E-06	462	4.85E-04	529	4.63E-04	596	5.14E-04	663	1.51E-04	730	1.91E-05
396	4.80E-06	463	4.65E-04	530	4.64E-04	597	5.12E-04	664	1.47E-04	731	1.87E-05
397	4.60E-06	464	4.44E-04	531	4.66E-04	598	5.10E-04	665	1.42E-04	732	1.81E-05
398	4.70E-06	465	4.22E-04	532	4.70E-04	599	5.07E-04	666	1.39E-04	733	1.75E-05
399	4.90E-06	466	4.00E-04	533	4.70E-04	600	5.02E-04	667	1.34E-04	734	1.71E-05
400	5.50E-06	467	3.78E-04	534	4.72E-04	601	5.00E-04	668	1.31E-04	735	1.66E-05
401	5.90E-06	468	3.57E-04	535	4.74E-04	602	4.96E-04	669	1.28E-04	736	1.59E-05
402	6.30E-06	469	3.34E-04	536	4.76E-04	603	4.91E-04	670	1.25E-04	737	1.54E-05
403	6.80E-06	470	3.13E-04	537	4.78E-04	604	4.86E-04	671	1.21E-04	738	1.49E-05
404	7.40E-06	471	2.86E-04	538	4.80E-04	605	4.85E-04	672	1.18E-04	739	1.47E-05
405	8.30E-06	472	2.64E-04	539	4.82E-04	606	4.81E-04	673	1.13E-04	740	1.40E-05
406	8.80E-06	473	2.50E-04	540	4.83E-04	607	4.80E-04	674	1.10E-04	741	1.36E-05
407	1.02E-05	474	2.37E-04	541	4.85E-04	608	4.83E-04	675	1.07E-04	742	1.31E-05
408	1.14E-05	475	2.27E-04	542	4.85E-04	609	4.84E-04	676	1.04E-04	743	1.27E-05
409	1.27E-05	476	2.19E-04	543	4.89E-04	610	4.73E-04	677	1.01E-04	744	1.23E-05
410	1.45E-05	477	2.15E-04	544	4.91E-04	611	4.66E-04	678	9.82E-05	745	1.22E-05
411	1.64E-05	478	2.12E-04	545	4.92E-04	612	4.76E-04	679	9.53E-05	746	1.16E-05
412	1.85E-05	479	2.11E-04	546	4.93E-04	613	4.92E-04	680	9.18E-05	747	1.13E-05
413	2.03E-05	480	2.09E-04	547	4.97E-04	614	4.84E-04	681	8.91E-05	748	1.09E-05
414	2.36E-05	481	2.09E-04	548	4.99E-04	615	4.57E-04	682	8.69E-05	749	1.05E-05
415	2.64E-05	482	2.12E-04	549	5.01E-04	616	4.38E-04	683	8.45E-05	750	1.02E-05
416	2.96E-05	483	2.11E-04	550	5.02E-04	617	4.29E-04	684	8.17E-05	751	9.90E-06
417	3.40E-05	484	2.15E-04	551	5.03E-04	618	4.23E-04	685	7.92E-05	752	9.50E-06
418	3.80E-05	485	2.18E-04	552	5.05E-04	619	4.18E-04	686	7.72E-05	753	9.20E-06
419	4.23E-05	486	2.21E-04	553	5.07E-04	620	4.11E-04	687	7.45E-05	754	8.90E-06
420	4.70E-05	487	2.26E-04	554	5.08E-04	621	4.03E-04	688	7.24E-05	755	8.80E-06
421	5.26E-05	488	2.30E-04	555	5.11E-04	622	3.98E-04	689	7.07E-05	756	8.40E-06
422	5.93E-05	489	2.35E-04	556	5.13E-04	623	3.91E-04	690	6.83E-05	757	8.20E-06
423	6.66E-05	490	2.41E-04	557	5.16E-04	624	3.88E-04	691	6.63E-05	758	8.00E-06
424	7.50E-05	491	2.49E-04	558	5.17E-04	625	3.80E-04	692	6.40E-05	759	7.70E-06
425	8.49E-05	492	2.57E-04	559	5.19E-04	626	3.76E-04	693	6.19E-05	760	7.60E-06
426	9.36E-05	493	2.64E-04	560	5.22E-04	627	3.71E-04	694	6.04E-05	761	7.10E-06
427	1.06E-04	494	2.73E-04	561	5.22E-04	628	3.70E-04	695	5.84E-05	762	6.90E-06
428	1.19E-04	495	2.82E-04	562	5.26E-04	629	3.87E-04	696	5.68E-05	763	6.90E-06
429	1.34E-04	496	2.90E-04	563	5.27E-04	630	4.33E-04	697	5.51E-05	764	6.50E-06
430	1.50E-04	497	2.99E-04	564	5.29E-04	631	4.50E-04	698	5.35E-05	765	6.40E-06
431	1.70E-04	498	3.09E-04	565	5.27E-04	632	4.01E-04	699	5.16E-05	766	6.00E-06
432	1.89E-04	499	3.17E-04	566	5.31E-04	633	3.60E-04	700	5.02E-05	767	6.00E-06
433	2.07E-04	500	3.27E-04	567	5.34E-04	634	3.68E-04	701	4.84E-05	768	5.90E-06
434	2.34E-04	501	3.35E-04	568	5.33E-04	635	3.84E-04	702	4.68E-05	769	5.70E-06
435	2.60E-04	502	3.42E-04	569	5.35E-04	636	3.54E-04	703	4.55E-05	770	5.40E-06
436	2.86E-04	503	3.51E-04	570	5.35E-04	637	3.16E-04	704	4.41E-05	771	5.20E-06
437	3.21E-04	504	3.60E-04	571	5.36E-04	638	2.95E-04	705	4.29E-05	772	5.10E-06
438	3.55E-04	505	3.66E-04	572	5.37E-04	639	2.85E-04	706	4.15E-05	773	5.00E-06
439	3.98E-04	506	3.72E-04	573	5.38E-04	640	2.77E-04	707	4.01E-05	774	4.90E-06
440	4.45E-04	507	3.79E-04	574	5.40E-04	641	2.68E-04	708	3.87E-05	775	4.60E-06
441	4.91E-04	508	3.88E-04	575	5.39E-04	642	2.63E-04	709	3.77E-05	776	4.70E-06
442	5.54E-04	509	3.92E-04	576	5.40E-04	643	2.55E-04	710	3.64E-05	777	4.50E-06
443	6.24E-04	510	3.99E-04	577	5.40E-04	644	2.50E-04	711	3.56E-05	778	4.20E-06
444	6.96E-04	511	4.05E-04	578	5.40E-04	645	2.45E-04	712	3.42E-05	779	4.30E-06
445	7.64E-04	512	4.10E-04	579	5.40E-04	646	2.45E-04	713	3.33E-05	780	4.30E-06
446	8.34E-04	513	4.15E-04	580	5.40E-04	647	2.50E-04	714	3.23E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	WPX2 @ 60W / 5000K	Sample ID	231101003-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	24.8	Humidity (%RH)	42.9

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	0.484	57.8	0.996
NON-WORST CASE	277.0	60	0.225	56.8	0.913

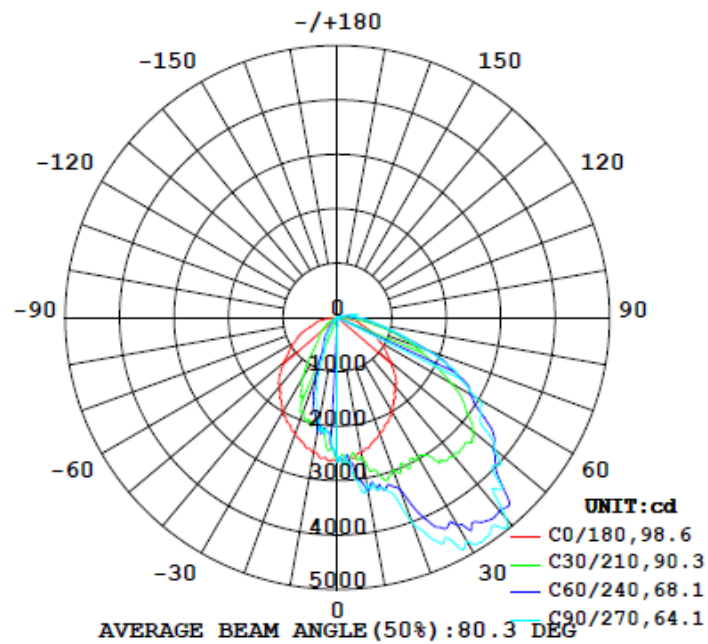
Test Result

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	8386	113.9	147.9	65.6	98.5	145.1	2.7%	B2-U3-G2
0°-90° zones	8186	113.9	147.9	65.6	98.5	141.6	2.8%	B2-U3-G2

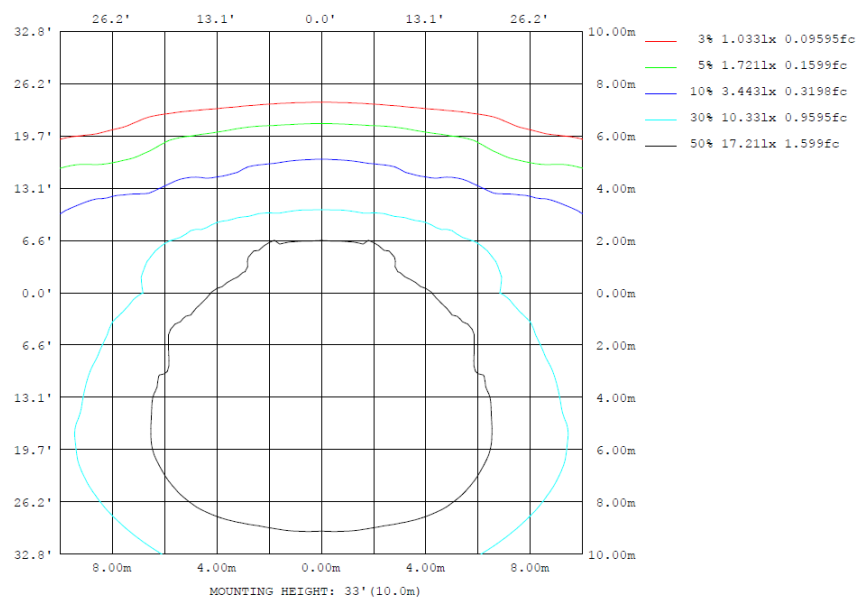
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

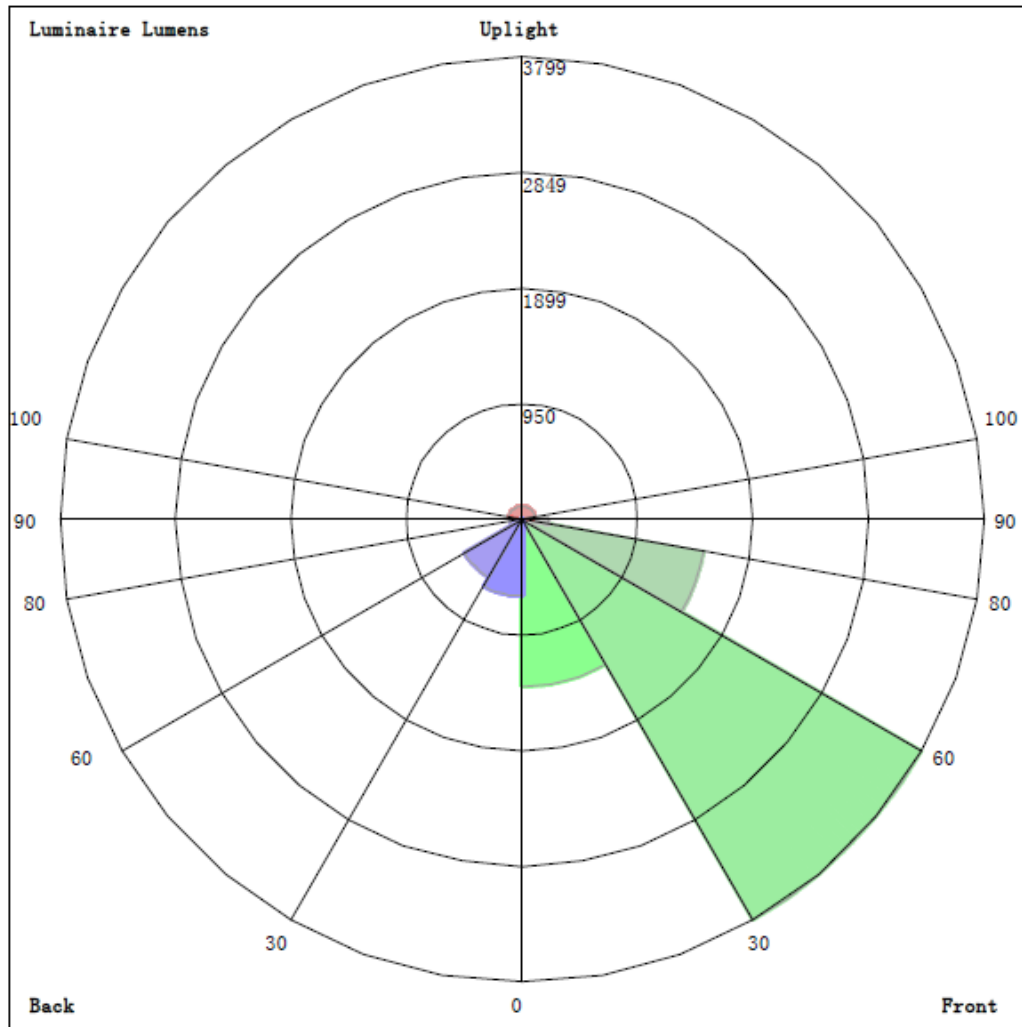
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	zone	total	lum, lamp
10	2517	2997	3111	2997	2517	2165	1931	2165	0- 10	237.8	237.8	2.84, 2.84
20	2264	3161	4013	3161	2264	1486	797.9	1486	10- 20	681.3	919.1	11, 11
30	1975	3930	4751	3930	1975	610.8	393.8	610.8	20- 30	1083	2002	23.9, 23.9
40	1657	4131	4804	4131	1657	361.2	119.2	361.2	30- 40	1430	3431	40.9, 40.9
50	1302	3662	3770	3662	1302	147.2	68.25	147.2	40- 50	1540	4971	59.3, 59.3
60	916.3	2734	2932	2734	916.3	66.81	25.97	66.81	50- 60	1376	6347	75.7, 75.7
70	560.5	1778	1707	1778	560.5	8.451	1.318	8.451	60- 70	1046	7393	88.2, 88.2
80	305.0	748.1	804.4	748.1	305.0	3.428	1.821	3.428	70- 80	565.5	7958	94.9, 94.9
90	28.49	223.5	382.3	223.5	28.49	2.234	2.079	2.234	80- 90	227.7	8186	97.6, 97.6
100	23.68	91.55	358.1	91.55	23.68	2.858	2.625	2.858	90-100	91.40	8278	98.7, 98.7
110	14.00	21.44	64.93	21.44	14.00	2.274	2.883	2.274	100-110	39.23	8317	99.2, 99.2
120	11.38	64.95	30.50	64.95	11.38	2.192	2.786	2.192	110-120	19.65	8336	99.4, 99.4
130	6.329	54.25	66.35	54.25	6.329	2.336	3.226	2.336	120-130	22.34	8359	99.7, 99.7
140	2.000	33.80	53.82	33.80	2.000	2.564	3.352	2.564	130-140	15.84	8375	99.9, 99.9
150	1.550	16.61	28.21	16.61	1.550	2.863	3.335	2.863	140-150	8.068	8383	100, 100
160	1.591	1.337	10.97	1.337	1.591	3.017	2.947	3.017	150-160	2.822	8386	100, 100
170	1.858	1.759	1.903	1.759	1.858	2.453	2.288	2.453	160-170	0.7411	8386	100, 100
180	2.256	2.180	1.841	2.180	2.256	2.070	1.958	2.070	170-180	0.2015	8386	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	237.76	0-10	237.76	2.84%
10-20	681.32	0-20	919.08	10.96%
20-30	1082.67	0-30	2001.75	23.87%
30-40	1429.70	0-40	3431.45	40.92%
40-50	1539.57	0-50	4971.02	59.28%
50-60	1376.03	0-60	6347.05	75.68%
60-70	1045.95	0-70	7393.00	88.16%
70-80	565.48	0-80	7958.48	94.90%
80-90	227.67	0-90	8186.15	97.61%
90-100	91.40	0-100	8277.55	98.70%
100-110	39.23	0-110	8316.78	99.17%
110-120	19.65	0-120	8336.43	99.41%
120-130	22.34	0-130	8358.77	99.67%
130-140	15.84	0-140	8374.61	99.86%
140-150	8.07	0-150	8382.68	99.96%
150-160	2.82	0-160	8385.50	99.99%
160-170	0.74	0-170	8386.24	100.00%
170-180	0.20	0-180	8386.44	100.00%

4.2 Goniophotometer Test

LCS/BUG

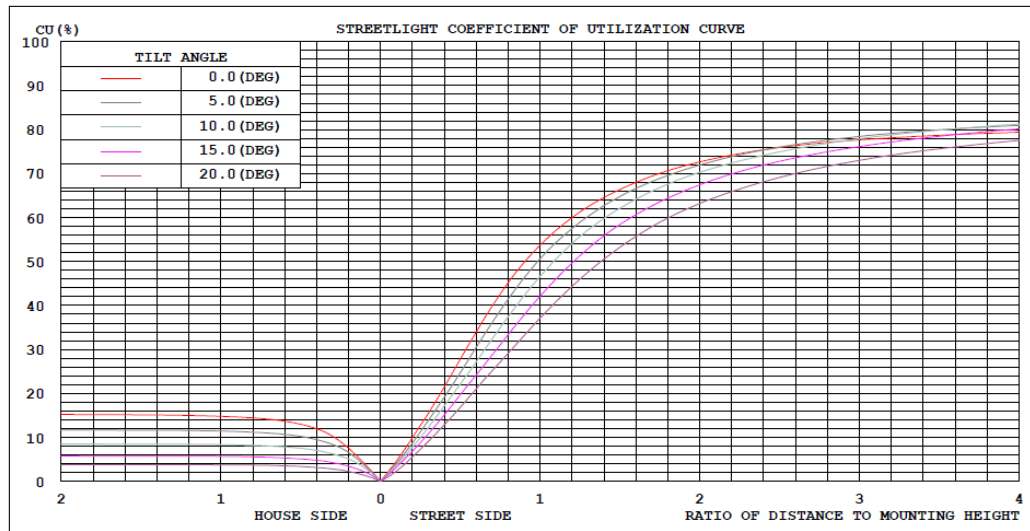


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

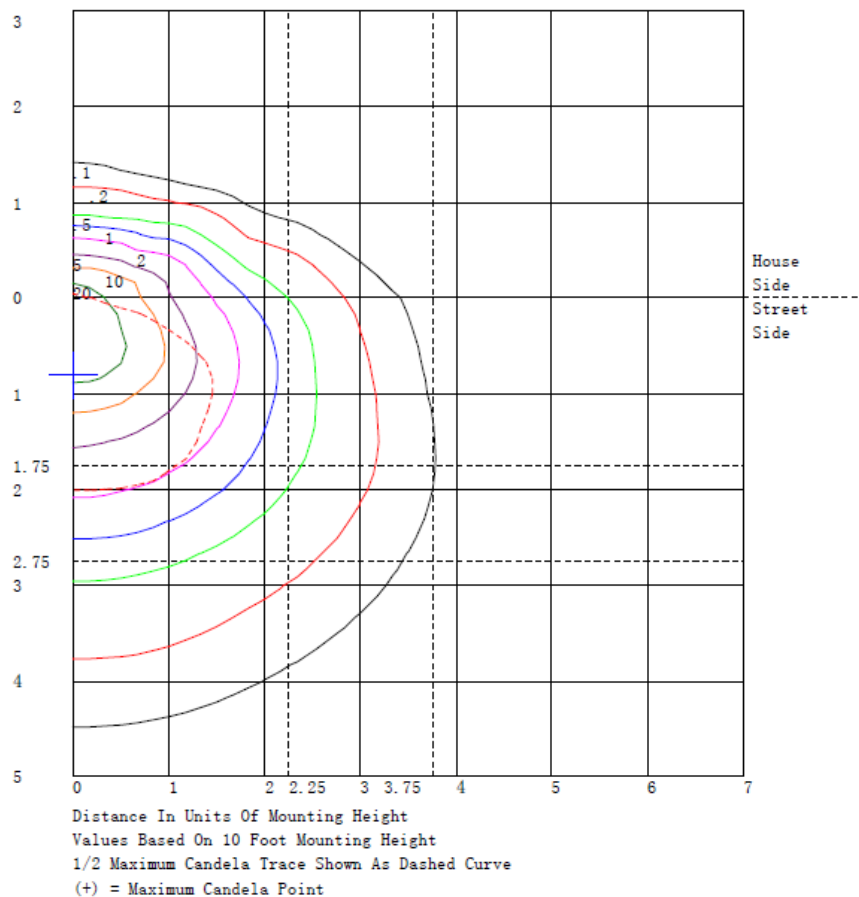
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1372.2	N.A.	16.4
FM - Front-Medium (30-60)	3798.9	N.A.	45.3
FH - Front-High (60-80)	1518.0	N.A.	18.1
FVH - Front-Very High (80-90)	217.2	N.A.	2.6
BL - Back-Low (0-30)	629.6	N.A.	7.5
BM - Back-Medium (30-60)	546.4	N.A.	6.5
BH - Back-High (60-80)	93.4	N.A.	1.1
BVH - Back-Very High (80-90)	10.5	N.A.	0.1
UL - Uplight-Low (90-100)	91.4	N.A.	1.1
UH - Uplight-High (100-180)	108.9	N.A.	1.3
Total	8386.5	N.A.	100.0
BUG Rating	B2-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	2648	2648	2648	2649	2650	2651	2652	2652	2652	2653	2654	2656	2657	2657	2657	2657	2658	2659	2659
5	2581	2543	2525	2526	2566	2613	2651	2629	2599	2576	2608	2649	2688	2687	2678	2668	2676	2686	2694
10	2517	2535	2552	2568	2565	2575	2610	2725	2860	2997	3102	3185	3238	3228	3196	3155	3136	3121	3111
15	2398	2382	2413	2491	2655	2838	3009	3084	3130	3161	3213	3257	3287	3279	3260	3238	3238	3239	3238
20	2264	2325	2410	2520	2681	2847	2998	3070	3120	3161	3212	3276	3360	3512	3674	3825	3924	3988	4013
25	2145	2298	2451	2605	2769	2927	3071	3150	3237	3361	3656	3967	4246	4339	4380	4397	4477	4548	4592
30	1975	2307	2572	2769	2831	2877	2958	3257	3597	3930	4136	4298	4424	4533	4618	4680	4719	4742	4751
35	1832	2112	2376	2624	2844	3057	3271	3514	3758	3996	4223	4428	4603	4725	4813	4869	4892	4892	4877
40	1657	1932	2209	2489	2774	3059	3340	3621	3888	4131	4329	4498	4641	4775	4876	4938	4912	4860	4804
45	1503	1765	2042	2334	2659	2986	3302	3597	3854	4058	4149	4192	4206	4245	4267	4269	4209	4143	4090
50	1302	1528	1791	2091	2477	2862	3210	3421	3568	3662	3705	3721	3727	3770	3810	3838	3823	3797	3770
55	1089	1335	1601	1887	2231	2567	2867	3047	3173	3255	3321	3355	3358	3309	3247	3188	3187	3197	3208
60	916	1178	1435	1686	1947	2191	2404	2550	2659	2734	2769	2790	2812	2891	2968	3027	3007	2970	2932
65	761	996	1214	1414	1595	1760	1909	2050	2171	2267	2316	2342	2354	2366	2374	2382	2400	2415	2424
70	560	697	841	991	1160	1326	1481	1607	1708	1778	1791	1781	1761	1765	1768	1767	1746	1724	1707
75	428	478	548	638	771	907	1029	1089	1124	1141	1143	1139	1136	1156	1179	1200	1206	1206	1204
80	305	308	329	369	439	518	598	660	711	748	759	760	757	767	777	788	796	801	804
85	125	119	128	152	199	255	313	357	396	432	465	495	519	534	544	551	556	559	560
90	28.5	42.6	59.0	77.6	99.0	122	147	171	197	224	254	283	311	333	351	365	375	381	382
95	22.3	29.9	38.1	47.0	56.1	66.1	77.2	89.5	104	120	141	163	186	209	230	248	260	267	269
100	23.7	24.3	25.8	28.1	29.7	33.3	40.1	51.9	68.8	91.6	124	162	202	244	284	318	341	354	358
105	17.8	18.1	18.6	19.2	18.9	19.4	21.5	27.1	34.7	43.7	55.4	66.6	75.5	75.0	73.1	72.5	82.3	93.6	104
110	14.0	10.6	10.8	14.6	26.4	38.4	47.2	39.2	29.1	21.4	31.2	44.3	57.2	59.9	60.1	59.4	61.5	63.5	64.9
115	16.7	10.6	8.86	11.5	21.8	34.0	45.5	50.8	52.6	50.5	39.0	26.7	17.4	22.5	31.4	41.6	48.4	53.1	54.6
120	11.4	6.53	5.81	9.24	19.3	31.7	44.3	53.0	59.9	64.9	68.7	69.9	67.9	58.7	47.9	37.6	32.6	30.1	30.5
125	8.53	4.48	4.12	7.45	16.5	27.7	39.6	49.2	57.7	64.8	69.9	73.3	74.9	74.0	72.0	69.4	66.8	64.8	63.6
130	6.33	3.49	3.53	6.46	13.8	22.8	32.6	40.4	47.7	54.2	60.4	65.5	69.2	70.3	70.2	69.3	68.1	67.0	66.4
135	2.10	0.00	0.00	0.98	8.06	16.8	26.1	32.7	38.7	44.3	50.6	56.2	60.7	62.4	62.9	62.8	62.8	62.6	62.4
140	2.00	3.56	5.63	8.23	11.4	15.1	19.2	23.9	28.9	33.8	38.5	42.8	46.5	48.9	50.6	51.8	52.9	53.6	53.8
145	1.95	2.30	3.25	4.79	7.04	9.80	13.0	16.8	20.7	24.5	27.6	30.3	32.8	34.9	36.8	38.4	40.0	41.2	41.8
150	1.55	1.56	1.58	1.59	0.87	0.69	1.62	6.15	11.4	16.6	19.2	21.0	22.4	23.8	25.0	26.0	27.0	27.8	28.2
155	1.44	1.42	1.48	1.61	1.58	1.81	2.48	4.35	6.60	9.00	11.1	13.1	14.7	15.7	16.5	17.1	17.7	18.3	18.6
160	1.59	1.51	1.49	1.53	1.72	1.90	2.02	1.56	1.25	1.34	2.88	4.78	6.72	7.92	8.88	9.63	10.3	10.7	11.0
165	1.72	1.73	1.73	1.72	1.66	1.62	1.63	1.80	2.03	2.30	2.68	2.98	3.11	2.63	2.03	1.46	1.34	1.34	1.43
170	1.86	1.87	1.87	1.87	1.86	1.85	1.83	1.81	1.78	1.76	1.74	1.72	1.72	1.74	1.77	1.81	1.83	1.86	1.90
175	2.00	2.01	2.02	2.03	2.02	2.02	2.01	1.99	1.98	1.96	1.94	1.92	1.90	1.87	1.84	1.81	1.78	1.75	1.73
180	2.26	2.27	2.28	2.28	2.26	2.25	2.23	2.22	2.20	2.18	2.14	2.09	2.05	2.01	1.98	1.95	1.91	1.87	1.84

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	2659	2658	2657	2657	2657	2657	2656	2654	2653	2652	2652	2652	2651	2650	2649	2648	2648	2648	2655	
5	2686	2676	2668	2678	2687	2688	2649	2608	2576	2599	2629	2651	2613	2566	2526	2525	2543	2581	2490	
10	3121	3136	3155	3196	3228	3238	3185	3102	2997	2860	2725	2610	2575	2565	2568	2552	2535	2517	2426	
15	3239	3238	3238	3260	3279	3287	3257	3213	3161	3130	3084	3009	2838	2655	2491	2413	2382	2398	2217	
20	3988	3924	3825	3674	3512	3360	3276	3212	3161	3120	3070	2998	2847	2681	2520	2410	2325	2264	2103	
25	4548	4477	4397	4380	4339	4246	3967	3656	3361	3237	3150	3071	2927	2769	2605	2451	2298	2145	2056	
30	4742	4719	4680	4618	4533	4424	4298	4136	3930	3597	3257	2958	2877	2831	2769	2572	2307	1975	1971	
35	4892	4892	4869	4813	4725	4603	4428	4223	3996	3758	3514	3271	3057	2844	2624	2376	2112	1832	1857	
40	4860	4912	4938	4876	4775	4641	4498	4329	4131	3888	3621	3340	3059	2774	2489	2209	1932	1657	1643	
45	4143	4209	4269	4267	4245	4206	4192	4149	4058	3854	3597	3302	2986	2659	2334	2042	1765	1503	1439	
50	3797	3823	3838	3810	3770	3727	3721	3705	3662	3568	3421	3210	2862	2477	2091	1791	1528	1302	1170	
55	3197	3187	3188	3247	3309	3358	3355	3321	3255	3173	3047	2867	2567	2231	1887	1601	1335	1089	895	
60	2970	3007	3027	2968	2891	2812	2790	2769	2734	2659	2550	2404	2191	1947	1686	1435	1178	916	685	
65	2415	2400	2382	2374	2366	2354	2342	2316	2267	2171	2050	1909	1760	1595	1414	1214	996	761	554	
70	1724	1746	1767	1768	1765	1761	1781	1791	1778	1708	1607	1481	1326	1160	991	841	697	560	421	
75	1206	1206	1200	1179	1156	1136	1139	1143	1141	1124	1089	1029	907	771	638	548	478	428	306	
80	801	796	788	777	767	757	760	759	748	711	660	598	518	439	369	329	308	305	207	
85	559	556	551	544	534	519	495	465	432	396	357	313	255	199	152	128	119	125	88.8	
90	381	375	365	351	333	311	283	254	224	197	171	147	122	99.0	77.6	59.0	42.6	28.5	26.3	
95	267	260	248	230	209	186	163	141	120	104	89.5	77.2	66.1	56.1	47.0	38.1	29.9	22.3	19.4	
100	354	341	318	284	244	202	162	124	91.6	68.8	51.9	40.1	33.3	29.7	28.1	25.8	24.3	23.7	18.8	
105	93.6	82.3	72.5	73.1	75.0	75.5	66.6	55.4	43.7	34.7	27.1	21.5	19.4	18.9	19.2	18.6	18.1	17.8	13.7	
110	63.5	61.5	59.4	60.1	59.9	57.2	44.3	31.2	21.4	29.1	39.2	47.2	38.4	26.4	14.6	10.8	10.6	14.0	10.6	
115	53.1	48.4	41.6	31.4	22.5	17.4	26.7	39.0	50.5	52.6	50.8	45.5	34.0	21.8	11.5	8.86	10.6	16.7	11.9	
120	30.1	32.6	37.6	47.9	58.7	67.9	69.9	68.7	64.9	59.9	53.0	44.3	31.7	19.3	9.24	5.81	6.53	11.4	8.70	
125	64.8	66.8	69.4	72.0	74.0	74.9	73.3	69.9	64.8	57.7	49.2	39.6	27.7	16.5	7.45	4.12	4.48	8.53	6.76	
130	67.0	68.1	69.3	70.2	70.3	69.2	65.5	60.4	54.2	47.7	40.4	32.6	22.8	13.8	6.46	3.53	3.49	6.33	5.17	
135	62.6	62.8	62.8	62.9	62.4	60.7	56.2	50.6	44.3	38.7	32.7	26.1	16.8	8.06	0.98	0.00	0.00	2.10	2.63	
140	53.6	52.9	51.8	50.6	48.9	46.5	42.8	38.5	33.8	28.9	23.9	19.2	15.1	11.4	8.23	5.63	3.56	2.00	2.38	
145	41.2	40.8	36.4	36.8	34.9	32.8	30.7	26.7	24.5	20.7	16.8	13.0	9.80	7.04	4.79	3.25	2.30	1.95	2.22	
150	27.8	27.0	26.0	25.0	23.8	22.4	21.1	19.2	16.6	11.4	6.15	1.62	0.69	0.87	1.59	1.58	1.56	1.55	1.90	
155	18.3	17.7	17.1	16.5	15.7	14.7	13.0	11.1	9.00	6.60	4.35	2.48	1.81	1.58	1.61	1.48	1.42	1.44	2.00	
160	10.7	10.3	9.63	8.88	7.92	6.72	4.78	2.88	1.34	1.25	1.56	2.02	1.90	1.72	1.53	1.49	1.51	1.59	2.20	
165	1.34	1.34	1.46	2.03	2.63	3.11	2.98	2.68	2.30	2.03	1.80	1.63	1.62	1.66	1.72	1.73	1.73	1.72	2.35	
170	1.86	1.83	1.81	1.77	1.74	1.72	1.72	1.74	1.76	1.78	1.81	1.83	1.85	1.86	1.87	1.87	1.87	1.86	2.37	
175	1.75	1.78	1.81	1.84	1.87	1.90	1.92	1.94	1.96	1.98	1.99	2.01	2.02	2.02	2.03	2.02	2.01	2.00	2.34	
180	1.87	1.91	1.95	1.98	2.01	2.05	2.09	2.14	2.18	2.20	2.22	2.23	2.25	2.26	2.28	2.28	2.27	2.26	2.27	

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
y (DEG)	0	2660	2664	2666	2666	2665	2664	2664	2663	2662	2662	2661	2661	2660	2660	2660	2659	2660	2660
5	2421	2376	2377	2385	2382	2309	2226	2149	2126	2120	2124	2125	2127	2129	2127	2124	2120	2124	2127
10	2339	2258	2168	2093	2045	2072	2118	2165	2171	2159	2129	2061	1989	1925	1915	1919	1931	1919	1915
15	2079	1985	1953	1951	1965	1976	1980	1968	1905	1826	1741	1661	1591	1538	1529	1535	1547	1535	1529
20	1978	1888	1863	1851	1830	1729	1610	1486	1392	1303	1216	1111	1012	924	860	817	798	817	860
25	1968	1880	1808	1725	1618	1439	1242	1046	882	741	632	585	566	563	552	546	545	546	552
30	1920	1821	1655	1455	1237	1006	790	611	539	507	497	466	441	420	406	397	394	397	406
35	1807	1681	1424	1133	852	693	576	492	427	380	344	307	276	252	237	228	226	228	237
40	1563	1417	1143	847	576	463	399	361	298	243	197	166	144	130	122	119	119	119	122
45	1331	1179	938	686	457	347	278	235	186	148	121	109	105	105	101	99.1	98.2	99.1	101
50	1028	876	695	519	362	264	194	147	118	102	94.4	84.2	77.0	72.3	69.4	68.2	68.3	68.2	69.4
55	723	574	449	345	260	194	143	106	82.2	68.0	60.6	55.0	52.4	51.6	50.2	49.3	49.1	49.3	50.2
60	496	349	260	203	166	124	91.3	66.8	51.6	42.3	37.3	33.6	31.6	30.6	28.6	27.0	26.0	27.0	28.6
65	385	255	177	129	100	71.3	50.6	35.8	22.6	12.8	6.11	2.54	0.99	0.76	0.50	0.66	1.02	0.66	0.50
70	303	209	142	94.1	60.7	35.2	18.4	8.45	2.74	0.63	0.74	0.29	0.44	0.89	1.02	1.17	1.32	1.17	1.02
75	206	128	79.3	47.9	29.5	15.8	8.22	4.96	2.14	1.00	0.92	0.67	0.74	1.00	1.18	1.39	1.59	1.39	1.18
80	129	71.3	39.9	23.4	16.6	9.10	5.09	3.43	1.88	1.23	1.14	0.98	1.00	1.16	1.37	1.60	1.82	1.60	1.37
85	59.8	37.4	23.8	15.3	10.5	6.34	3.82	2.51	1.65	1.34	1.37	1.27	1.27	1.36	1.54	1.74	1.94	1.74	1.54
90	23.5	20.3	15.8	11.3	7.22	4.84	3.23	2.23	1.73	1.57	1.62	1.57	1.58	1.64	1.77	1.92	2.08	1.92	1.77
95	16.6	13.8	10.9	8.12	5.74	4.14	3.00	2.26	1.92	1.83	1.88	1.85	1.86	1.91	2.00	2.11	2.25	2.11	2.00
100	14.5	11.1	8.41	6.39	4.91	3.89	3.24	2.86	2.62	2.51	2.49	2.41	2.36	2.35	2.40	2.49	2.62	2.49	2.40
105	10.2	7.26	4.89	3.13	2.01	1.93	2.27	2.78	2.82	2.80	2.75	2.71	2.68	2.67	2.72	2.81	2.93	2.81	2.72
110	7.91	5.80	4.50	3.68	3.19	2.72	2.42	2.27	2.34	2.50	2.68	2.74	2.78	2.80	2.82	2.85	2.88	2.85	2.82
115	8.09	5.25	3.76	3.00	2.73	2.41	2.27	2.26	2.29	2.37	2.47	2.50	2.53	2.56	2.60	2.64	2.67	2.64	2.60
120	6.49	4.76	3.59	2.82	2.37	2.15	2.11	2.19	2.27	2.38	2.50	2.55	2.60	2.64	2.70	2.75	2.79	2.75	2.70
125	5.28	4.09	3.24	2.64	2.27	2.13	2.13	2.23	2.35	2.48	2.62	2.68	2.73	2.77	2.85	2.91	2.96	2.91	2.85
130	4.20	3.42	2.83	2.42	2.18	2.14	2.20	2.34	2.43	2.53	2.64	2.75	2.87	2.98	3.09	3.17	3.23	3.17	3.09
135	2.93	3.05	2.82	2.51	2.20	2.21	2.30	2.44	2.56	2.68	2.80	2.90	2.99	3.07	3.15	3.21	3.26	3.21	3.15
140	2.59	2.70	2.62	2.48	2.35	2.38	2.46	2.56	2.65	2.73	2.82	2.92	3.02	3.12	3.21	3.29	3.35	3.29	3.21
145	2.42	2.55	2.58	2.57	2.55	2.59	2.64	2.71	2.80	2.90	2.99	3.05	3.10	3.16	3.25	3.33	3.40	3.33	3.25
150	2.32	2.56	2.65	2.68	2.69	2.75	2.80	2.86	2.92	2.97	3.01	3.05	3.08	3.13	3.20	3.28	3.34	3.28	3.20
155	2.54	2.87	2.99	3.01	2.97	2.95	2.92	2.89	2.91	2.93	2.97	3.03	3.09	3.14	3.14	3.12	3.11	3.12	3.14
160	2.80	3.14	3.26	3.25	3.17	3.12	3.07	3.02	3.01	3.02	3.02	2.97	2.93	2.90	2.91	2.93	2.95	2.93	2.91
165	2.89	3.21	3.28	3.23	3.12	3.06	3.00	2.94	2.91	2.88	2.84	2.75	2.65	2.58	2.60	2.63	2.67	2.63	2.60
170	2.75	2.97	3.00	2.92	2.78	2.67	2.56	2.45	2.41	2.39	2.37	2.34	2.31	2.29	2.29	2.29	2.29	2.29	2.29
175	2.59	2.74	2.77	2.72	2.61	2.48	2.39	2.21	2.19	2.20	2.21	2.15	2.08	2.03	2.05	2.08	2.12	2.08	2.05
180	2.24	2.23	2.22	2.21	2.19	2.16	2.12	2.07	2.02	1.97	1.93	1.90	1.88	1.87	1.89	1.92	1.96	1.92	1.89

C (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
y (DEG)	0	2660	2661	2661	2662	2662	2662	2663	2664	2664	2665	2666	2666	2664	2660	2655			
5	2129	2127	2125	2124	2120	2126	2149	2226	2309	2382	2385	2377	2376	2421	2490				
10	1925	1989	2061	2129	2159	2171	2165	2118	2072	2045	2093	2168	2258	2339	2426				
15	1538	1591	1661	1741	1826	1905	1968	1980	1976	1965	1951	1953	1985	2079	2217				
20	924	1012	1111	1216	1303	1392	1486	1610	1729	1830	1851	1863	1888	1978	2103				
25	563	566	585	632	741	882	1046	1242	1439	1618	1725	1808	1880	1968	2056				
30	420	441	466	497	507	539	611	790	1006	1237	1455	1655	1821	1920	1971				
35	252	276	307	344	380	427	492	576	693	852	1133	1424	1681	1807	1857				
40	130	144	166	197	243	298	361	399	463	576	847	1143	1417	1563	1643				
45	105	105	109	121	148	186	235	278	347	457	686	938	1179	1331	1439				
50	72.3	77.0	84.2	94.4	102	118	147	194	264	362	519	695	876	1028	1170				
55	51.6	52.4	55.0	60.6	68.0	82.2	106	143	194	260	345	449	574	723	895				
60	30.6	31.6	33.6	37.3	42.3	51.6	66.8	91.3	124	166	203	260	349	496	685				
65	0.76	0.99	2.54	6.11	12.8	22.6	35.8	50.6	71.3	100	129	177	255	385	554				
70	0.89	0.44	0.29	0.74	0.63	2.74	8.45	18.4	35.2	60.7	94.1	142	209	303	421				
75	1.00	0.74	0.67	0.92	1.00	2.14	4.96	8.22	15.8	29.5	47.9	79.3	128	206	306				
80	1.16	1.00	0.98	1.14	1.23	1.88	3.43	5.09	9.10	16.6	23.4	39.9	71.3	129	207				
85	1.36	1.27	1.27	1.37	1.34	1.65	2.51	3.82	6.34	10.5	15.3	23.8	37.4	59.8	88.8				
90	1.64	1.58	1.57	1.62	1.57	1.73	2.23	3.23	4.84	7.22	11.3	15.8	20.3	23.5	26.3				
95	1.91	1.86	1.85	1.88	1.83	1.92	2.26	3.00	4.14	5.74	8.12	10.9	13.8	16.6	19.4				
100	2.35	2.36	2.41	2.49	2.51	2.62	2.86	3.24	3.89	4.91	6.39	8.41	11.1	14.5	18.8				
105	2.67	2.68	2.71	2.75	2.80	2.82	2.78	2.27	1.93	2.01	3.13	4.89	7.26	10.2	13.7				
110	2.80	2.78	2.74	2.68	2.50	2.34	2.27	2.42	2.72	3.19	3.68	4.50	5.80	7.91	10.6				
115	2.56	2.53	2.50	2.47	2.37	2.29	2.26	2.27	2.41	2.73	3.00	3.76	5.25	8.09	11.9				
120	2.64	2.60	2.55	2.50	2.38	2.27	2.19	2.11	2.15	2.37	2.82	3.59	4.76	6.49	8.70				
125	2.77	2.73	2.68	2.62	2.48	2.35	2.23	2.13	2.13	2.27	2.64	3.24	4.09	5.28	6.76				
130	2.98	2.87	2.75	2.64	2.53	2.43	2.34	2.20	2.14	2.18	2.42	2.83	3.42	4.20	5.17				
135	3.07	2.99	2.90	2.80	2.68	2.56	2.44	2.30	2.21	2.20	2.51	2.82	3.05	2.93	2.62				
140	3.12	3.02	2.92	2.82	2.73	2.65	2.56	2.46	2.38	2.35	2.48	2.62	2.70	2.59	2.35				
145	3.16	3.10	3.05	2.99	2.90	2.80	2.71	2.64	2.59	2.55	2.57	2.58	2.55	2.42	2.22				
150	3.13	3.08	3.05	3.01	2.97	2.92	2.86	2.80	2.75	2.69	2.68	2.65	2.56	2.32	1.98				
155	3.14	3.09	3.03	2.97	2.93	2.91	2.89	2.92	2.95	2.97	3.01	2.99	2.87	2.54	2.07				
160	2.90	2.93	2.97	3.02	3.02	3.01	3.02	3.07	3.12	3.17	3.25	3.26	3.14	2.80	2.28				
165	2.58	2.65	2.75	2.84	2.88	2.91	2.94	3.00	3.06	3.12	3.23	3.28	3.21	2.89	2.39				
170	2.29	2.31	2.34	2.37	2.39	2.41	2.45	2.56	2.67	2.78	2.92	3.00	2.97	2.75	2.37				
175	2.03	2.08	2.15	2.21	2.20	2.19	2.21	2.33	2.48	2.61	2.72	2.77	2.74	2.59	2.34				
180	1.87	1.88	1.90	1.93	1.97	2.02	2.07	2.12	2.16	2.19	2.21	2.22	2.23	2.24	2.25				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	WPX2 @ 60W / 5000K	Sample ID	231101003-S1
Temperature (°C)	25.4	Humidity (%RH)	41.0

Test Method
<p>The samples were tested according to the ANSI C82.77:2014</p> <p>The total harmonic distortion shall be measured to the 40th order.</p> <p>The ambient temperature shall be maintained at 25±1°C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion was calculated.</p>

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD(%)
120.0	60	0.484	57.8	0.996	2.13
277.0	60	0.225	56.8	0.913	10.44

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	2023-08-25	2024-08-24
NTC-F01-019	Temperature & Humidity Meter	2022-11-12	2023-11-11

*****End of Report*****