

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

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Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		6227
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		146.2
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		6075
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	142.6
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		42.6
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	480V	15.54
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	480V	0.787
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5284
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		82.9
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%		2.9%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		480.0
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.113
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		42.6
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-11-08	WPX2 @ 40W / 5000K 480	231101004-S1
2	Goniophotometer Test	2023-11-08	WPX2 @ 40W / 5000K 480	231101004-S1
3	THD and PF Test	2023-11-08	WPX2 @ 40W / 5000K 480	231101004-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 @ 40W / 5000K 480, color tunable from 3000K, 4000K and 5000K.

Electrical Specification: 480Vac, 50/60Hz

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	WPX2 @ 40W / 5000K 480	Sample ID	231101004-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

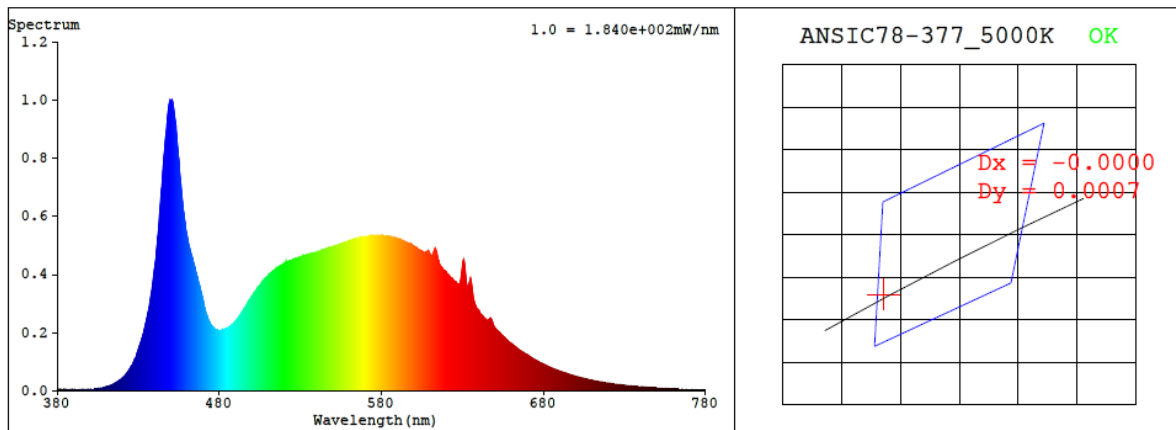
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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
480.0	60	0.113	42.6	0.787

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5284	82.9	8	0.0004	83	96	-13%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3376$ $y = 0.3462$ / $u' = 0.2084$ $v' = 0.4809$ ($duv=3.77e-04$)

CCT= 5284K Prcp WL: $L_d=566.0nm$ Purity=5.1%

Peak WL: $L_p=451nm$ FWHM: $=19.7nm$ Ratio:R=15.3% G=80.1% B=4.6%

Render Index: $R_a = 82.9$ AvgR = 76.0 TM30:Rf=83 Rg=96

EEL: 0.09565 A++ Highest

R1 =81 R2 =88 R3 =91 R4 =83 R5 =83 R6 =83 R7 =87

R8 =68 R9 =8 R10=70 R11=83 R12=61 R13=83 R14=95 R15=77

4.1 Integrating Sphere Test

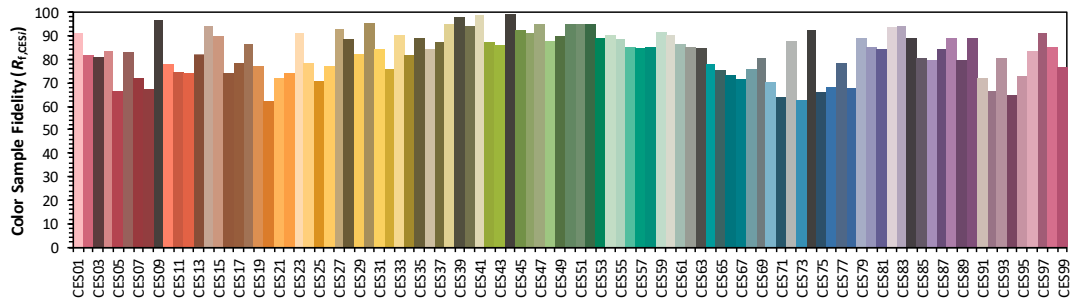
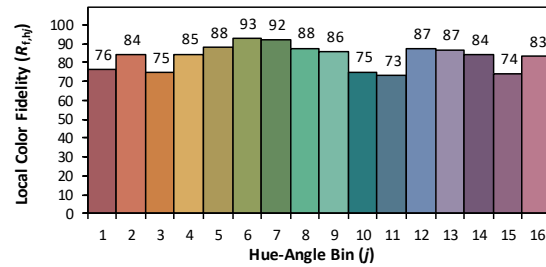
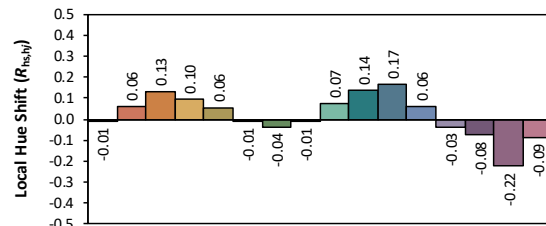
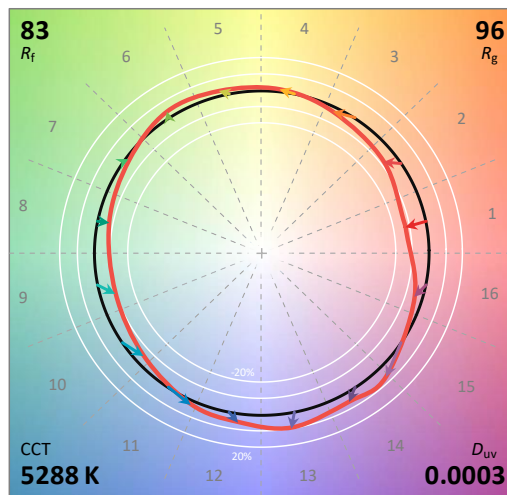
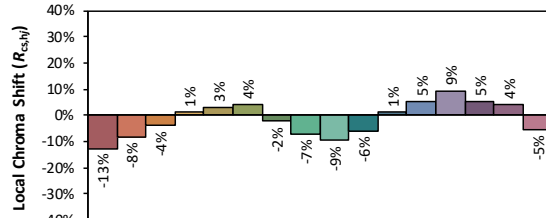
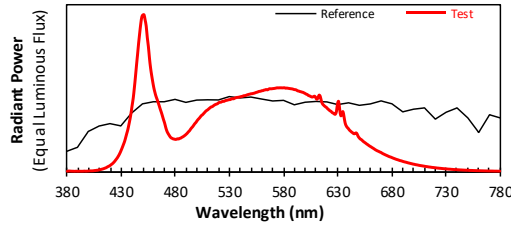
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/11/16

Model: WPX2 @ 40W / 5000K 480



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

x 0.3375
 y 0.3460
 u' 0.2084
 v' 0.4808

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	3.30E-06	447	8.83E-04	514	4.14E-04	581	5.34E-04	648	2.42E-04	715	3.06E-05
381	5.00E-06	448	9.43E-04	515	4.19E-04	582	5.31E-04	649	2.26E-04	716	2.99E-05
382	5.20E-06	449	9.85E-04	516	4.24E-04	583	5.32E-04	650	2.17E-04	717	2.86E-05
383	4.60E-06	450	9.96E-04	517	4.27E-04	584	5.31E-04	651	2.09E-04	718	2.78E-05
384	4.20E-06	451	9.97E-04	518	4.30E-04	585	5.30E-04	652	2.05E-04	719	2.72E-05
385	3.90E-06	452	9.64E-04	519	4.33E-04	586	5.29E-04	653	1.99E-04	720	2.62E-05
386	3.80E-06	453	9.25E-04	520	4.39E-04	587	5.28E-04	654	1.92E-04	721	2.55E-05
387	3.10E-06	454	8.52E-04	521	4.42E-04	588	5.27E-04	655	1.87E-04	722	2.44E-05
388	4.20E-06	455	7.96E-04	522	4.42E-04	589	5.25E-04	656	1.82E-04	723	2.39E-05
389	3.60E-06	456	7.23E-04	523	4.46E-04	590	5.22E-04	657	1.77E-04	724	2.30E-05
390	3.30E-06	457	6.62E-04	524	4.48E-04	591	5.22E-04	658	1.72E-04	725	2.24E-05
391	4.10E-06	458	6.15E-04	525	4.48E-04	592	5.19E-04	659	1.67E-04	726	2.17E-05
392	3.60E-06	459	5.73E-04	526	4.52E-04	593	5.15E-04	660	1.63E-04	727	2.09E-05
393	3.70E-06	460	5.35E-04	527	4.54E-04	594	5.13E-04	661	1.59E-04	728	2.02E-05
394	3.60E-06	461	5.06E-04	528	4.55E-04	595	5.10E-04	662	1.54E-04	729	1.97E-05
395	4.10E-06	462	4.81E-04	529	4.57E-04	596	5.09E-04	663	1.50E-04	730	1.90E-05
396	4.60E-06	463	4.62E-04	530	4.59E-04	597	5.06E-04	664	1.45E-04	731	1.83E-05
397	3.90E-06	464	4.41E-04	531	4.59E-04	598	5.05E-04	665	1.40E-04	732	1.78E-05
398	4.30E-06	465	4.20E-04	532	4.64E-04	599	5.01E-04	666	1.37E-04	733	1.71E-05
399	4.80E-06	466	3.98E-04	533	4.64E-04	600	4.98E-04	667	1.33E-04	734	1.70E-05
400	5.20E-06	467	3.78E-04	534	4.64E-04	601	4.94E-04	668	1.30E-04	735	1.61E-05
401	6.00E-06	468	3.55E-04	535	4.68E-04	602	4.91E-04	669	1.26E-04	736	1.57E-05
402	6.00E-06	469	3.31E-04	536	4.71E-04	603	4.85E-04	670	1.24E-04	737	1.51E-05
403	6.30E-06	470	3.11E-04	537	4.73E-04	604	4.83E-04	671	1.19E-04	738	1.47E-05
404	6.60E-06	471	2.84E-04	538	4.73E-04	605	4.79E-04	672	1.15E-04	739	1.42E-05
405	8.00E-06	472	2.61E-04	539	4.75E-04	606	4.76E-04	673	1.12E-04	740	1.39E-05
406	8.40E-06	473	2.46E-04	540	4.76E-04	607	4.75E-04	674	1.09E-04	741	1.34E-05
407	9.70E-06	474	2.35E-04	541	4.78E-04	608	4.79E-04	675	1.06E-04	742	1.29E-05
408	1.03E-05	475	2.24E-04	542	4.79E-04	609	4.80E-04	676	1.03E-04	743	1.24E-05
409	1.15E-05	476	2.16E-04	543	4.83E-04	610	4.69E-04	677	9.93E-05	744	1.21E-05
410	1.32E-05	477	2.13E-04	544	4.84E-04	611	4.61E-04	678	9.63E-05	745	1.18E-05
411	1.50E-05	478	2.09E-04	545	4.85E-04	612	4.72E-04	679	9.42E-05	746	1.13E-05
412	1.69E-05	479	2.08E-04	546	4.88E-04	613	4.88E-04	680	9.15E-05	747	1.10E-05
413	1.88E-05	480	2.06E-04	547	4.90E-04	614	4.79E-04	681	8.84E-05	748	1.06E-05
414	2.12E-05	481	2.07E-04	548	4.92E-04	615	4.52E-04	682	8.57E-05	749	1.05E-05
415	2.40E-05	482	2.10E-04	549	4.94E-04	616	4.33E-04	683	8.32E-05	750	1.01E-05
416	2.66E-05	483	2.09E-04	550	4.96E-04	617	4.25E-04	684	8.04E-05	751	9.70E-06
417	3.10E-05	484	2.13E-04	551	4.96E-04	618	4.18E-04	685	7.82E-05	752	9.30E-06
418	3.45E-05	485	2.15E-04	552	4.98E-04	619	4.12E-04	686	7.60E-05	753	9.00E-06
419	3.79E-05	486	2.19E-04	553	5.00E-04	620	4.07E-04	687	7.36E-05	754	8.90E-06
420	4.27E-05	487	2.23E-04	554	5.02E-04	621	4.00E-04	688	7.12E-05	755	8.70E-06
421	4.80E-05	488	2.28E-04	555	5.05E-04	622	3.94E-04	689	6.98E-05	756	8.20E-06
422	5.35E-05	489	2.33E-04	556	5.07E-04	623	3.88E-04	690	6.73E-05	757	8.10E-06
423	6.04E-05	490	2.39E-04	557	5.10E-04	624	3.84E-04	691	6.52E-05	758	7.70E-06
424	6.84E-05	491	2.46E-04	558	5.11E-04	625	3.77E-04	692	6.32E-05	759	7.60E-06
425	7.77E-05	492	2.54E-04	559	5.13E-04	626	3.73E-04	693	6.17E-05	760	7.30E-06
426	8.64E-05	493	2.61E-04	560	5.15E-04	627	3.68E-04	694	5.98E-05	761	7.10E-06
427	9.74E-05	494	2.71E-04	561	5.16E-04	628	3.66E-04	695	5.77E-05	762	6.90E-06
428	1.10E-04	495	2.79E-04	562	5.19E-04	629	3.84E-04	696	5.60E-05	763	6.60E-06
429	1.24E-04	496	2.87E-04	563	5.20E-04	630	4.32E-04	697	5.43E-05	764	6.50E-06
430	1.40E-04	497	2.97E-04	564	5.23E-04	631	4.47E-04	698	5.25E-05	765	6.30E-06
431	1.57E-04	498	3.07E-04	565	5.21E-04	632	3.96E-04	699	5.09E-05	766	6.00E-06
432	1.75E-04	499	3.14E-04	566	5.24E-04	633	3.57E-04	700	4.91E-05	767	5.90E-06
433	1.94E-04	500	3.24E-04	567	5.28E-04	634	3.65E-04	701	4.79E-05	768	5.80E-06
434	2.18E-04	501	3.33E-04	568	5.27E-04	635	3.83E-04	702	4.61E-05	769	5.40E-06
435	2.43E-04	502	3.40E-04	569	5.28E-04	636	3.50E-04	703	4.49E-05	770	5.30E-06
436	2.68E-04	503	3.48E-04	570	5.29E-04	637	3.12E-04	704	4.36E-05	771	5.20E-06
437	3.01E-04	504	3.57E-04	571	5.29E-04	638	2.93E-04	705	4.20E-05	772	5.00E-06
438	3.35E-04	505	3.62E-04	572	5.30E-04	639	2.82E-04	706	4.07E-05	773	5.00E-06
439	3.76E-04	506	3.69E-04	573	5.32E-04	640	2.75E-04	707	3.95E-05	774	4.80E-06
440	4.23E-04	507	3.77E-04	574	5.33E-04	641	2.65E-04	708	3.85E-05	775	4.50E-06
441	4.69E-04	508	3.85E-04	575	5.33E-04	642	2.59E-04	709	3.72E-05	776	4.40E-06
442	5.32E-04	509	3.90E-04	576	5.34E-04	643	2.53E-04	710	3.62E-05	777	4.50E-06
443	6.01E-04	510	3.95E-04	577	5.34E-04	644	2.48E-04	711	3.47E-05	778	4.20E-06
444	6.76E-04	511	4.01E-04	578	5.34E-04	645	2.43E-04	712	3.38E-05	779	4.10E-06
445	7.46E-04	512	4.06E-04	579	5.33E-04	646	2.43E-04	713	3.29E-05	780	4.10E-06
446	8.18E-04	513	4.12E-04	580	5.34E-04	647	2.48E-04	714	3.16E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	WPX2 @ 40W / 5000K 480	Sample ID	231101004-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	480.0	60	0.113	42.6	0.787
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

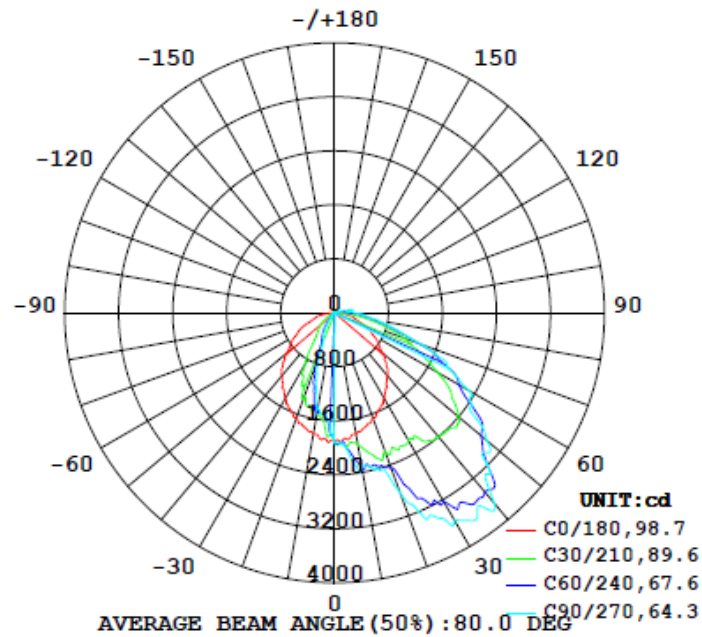
Test Result

Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	BUG
		C0-180	C90-270	C0-180	C90-270		(80°-90°)	
0°-180° zones	6227	114.0	147.1	65.1	97.1	146.2	2.8%	B1-U3-G2
0°-90° zones	6075	114.0	147.1	65.1	97.1	142.6	2.9%	B1-U3-G2

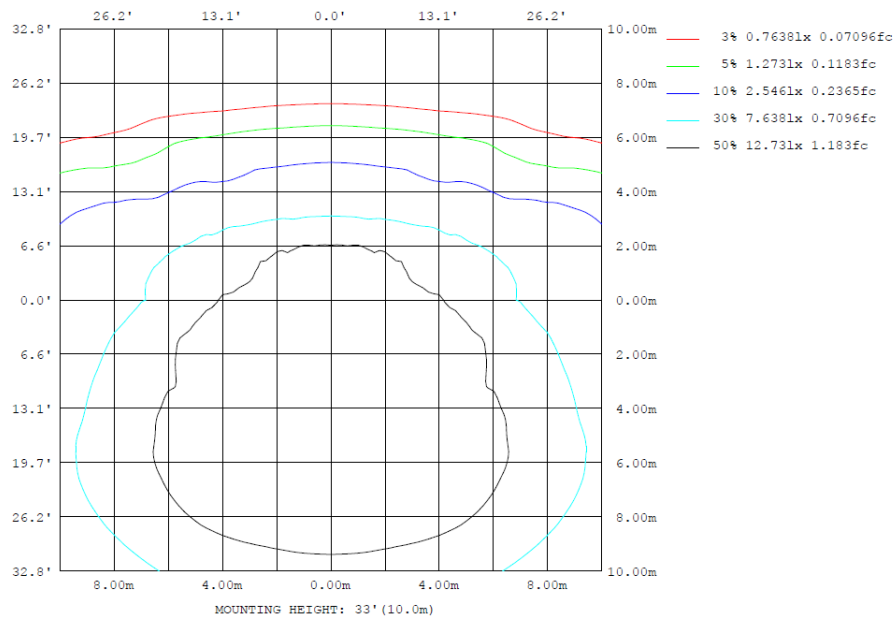
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

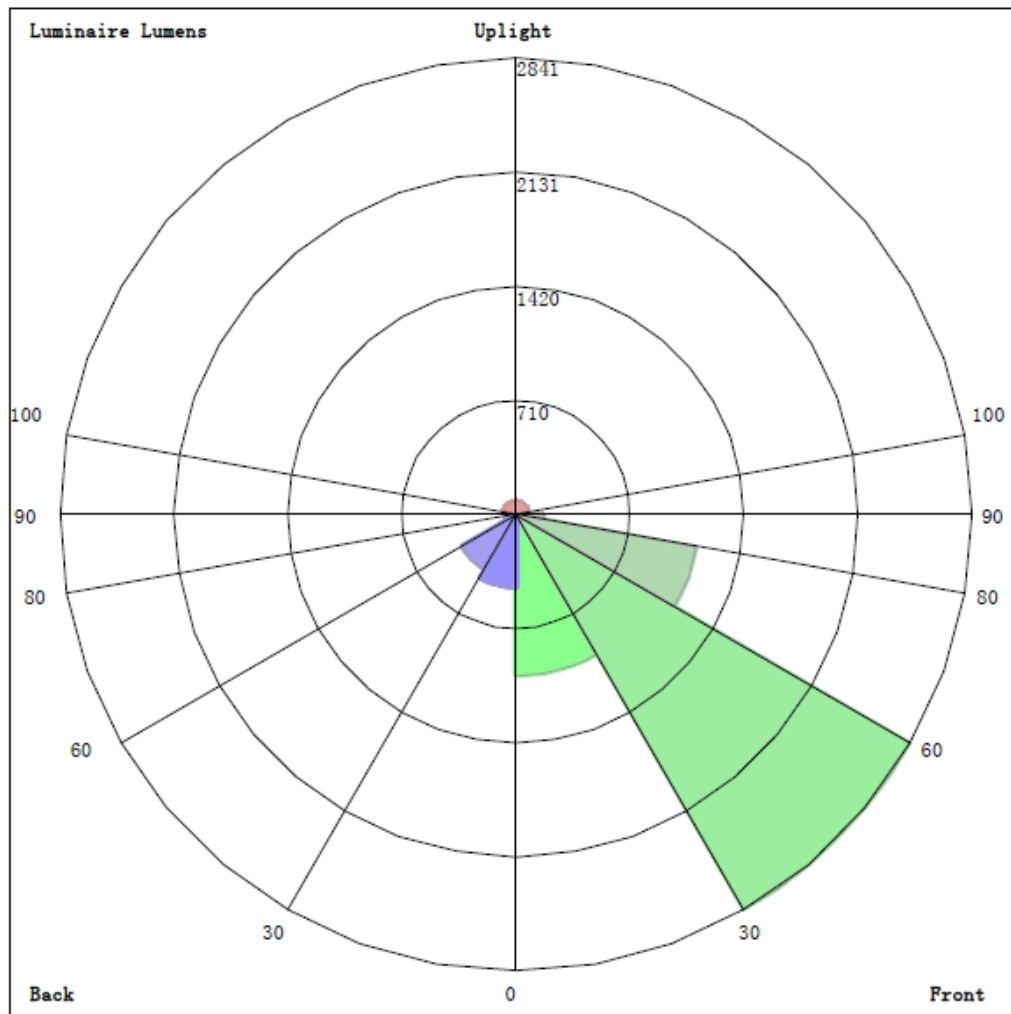
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	1828	2199	2303	2199	1828	1472	1445	1472	0- 10	174.4	174.4	2.8,2.8
20	1653	2349	2833	2349	1653	1085	549.1	1085	10- 20	495.7	670.2	10.8,10.8
30	1475	2840	3550	2840	1475	436.3	285.9	436.3	20- 30	788.2	1458	23.4,23.4
40	1218	3096	3680	3096	1218	257.7	90.59	257.7	30- 40	1055	2514	40.4,40.4
50	920.0	2783	2944	2783	920.0	107.8	51.00	107.8	40- 50	1150	3664	58.8,58.8
60	654.4	2055	2289	2055	654.4	46.94	15.67	46.94	50- 60	1026	4689	75.3,75.3
70	397.6	1322	1375	1322	397.6	5.994	1.008	5.994	60- 70	782.1	5471	87.9,87.9
80	216.6	574.2	662.7	574.2	216.6	2.554	1.410	2.554	70- 80	427.7	5899	94.7,94.7
90	20.50	171.5	304.8	171.5	20.50	1.731	1.517	1.731	80- 90	175.9	6075	97.6,97.6
100	17.19	70.55	276.1	70.55	17.19	2.187	1.952	2.187	90-100	69.80	6145	98.7,98.7
110	14.94	17.15	47.30	17.15	14.94	1.793	2.191	1.793	100-110	30.81	6176	99.2,99.2
120	8.239	48.27	20.77	48.27	8.239	1.720	2.138	1.720	110-120	14.89	6190	99.4,99.4
130	4.764	40.22	47.72	40.22	4.764	1.793	2.472	1.793	120-130	16.33	6207	99.7,99.7
140	1.509	25.10	39.29	25.10	1.509	1.947	2.515	1.947	130-140	11.60	6218	99.9,99.9
150	0.9886	12.52	21.22	12.52	0.9886	2.170	2.507	2.170	140-150	5.939	6224	100,100
160	1.190	0.9862	8.509	0.9862	1.190	2.241	2.214	2.241	150-160	2.135	6226	100,100
170	1.369	1.252	1.514	1.252	1.369	1.735	1.686	1.735	160-170	0.5630	6227	100,100
180	1.658	1.603	1.373	1.603	1.658	1.523	1.453	1.523	170-180	0.1471	6227	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	174.44	0-10	174.44	2.80%
10-20	495.75	0-20	670.19	10.76%
20-30	788.19	0-30	1458.38	23.42%
30-40	1055.18	0-40	2513.56	40.37%
40-50	1150.10	0-50	3663.66	58.83%
50-60	1025.65	0-60	4689.31	75.31%
60-70	782.10	0-70	5471.41	87.87%
70-80	427.65	0-80	5899.06	94.73%
80-90	175.89	0-90	6074.95	97.56%
90-100	69.80	0-100	6144.75	98.68%
100-110	30.81	0-110	6175.56	99.17%
110-120	14.89	0-120	6190.45	99.41%
120-130	16.33	0-130	6206.78	99.68%
130-140	11.60	0-140	6218.38	99.86%
140-150	5.94	0-150	6224.32	99.96%
150-160	2.13	0-160	6226.45	99.99%
160-170	0.56	0-170	6227.01	100.00%
170-180	0.15	0-180	6227.16	100.00%

4.2 Goniophotometer Test

LCS/BUG

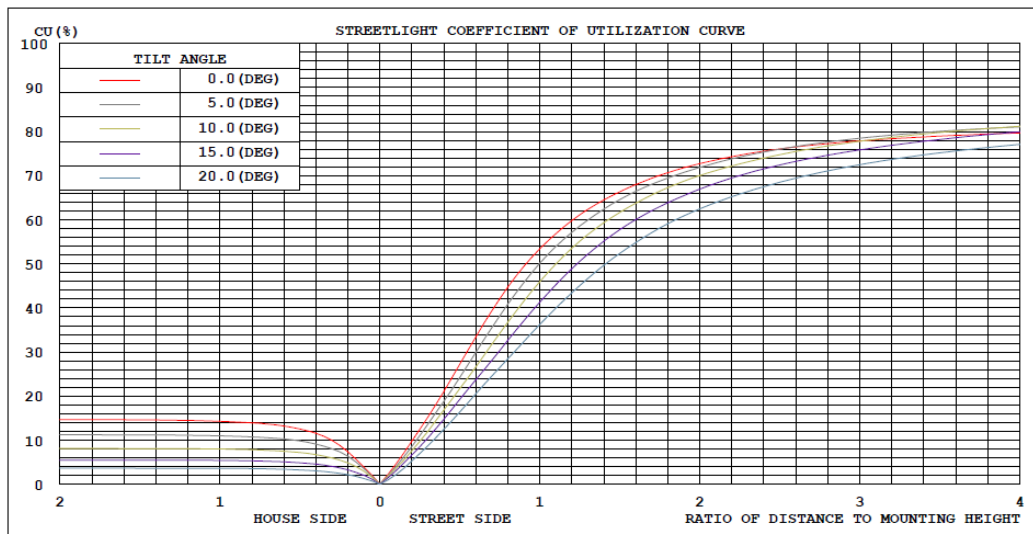


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

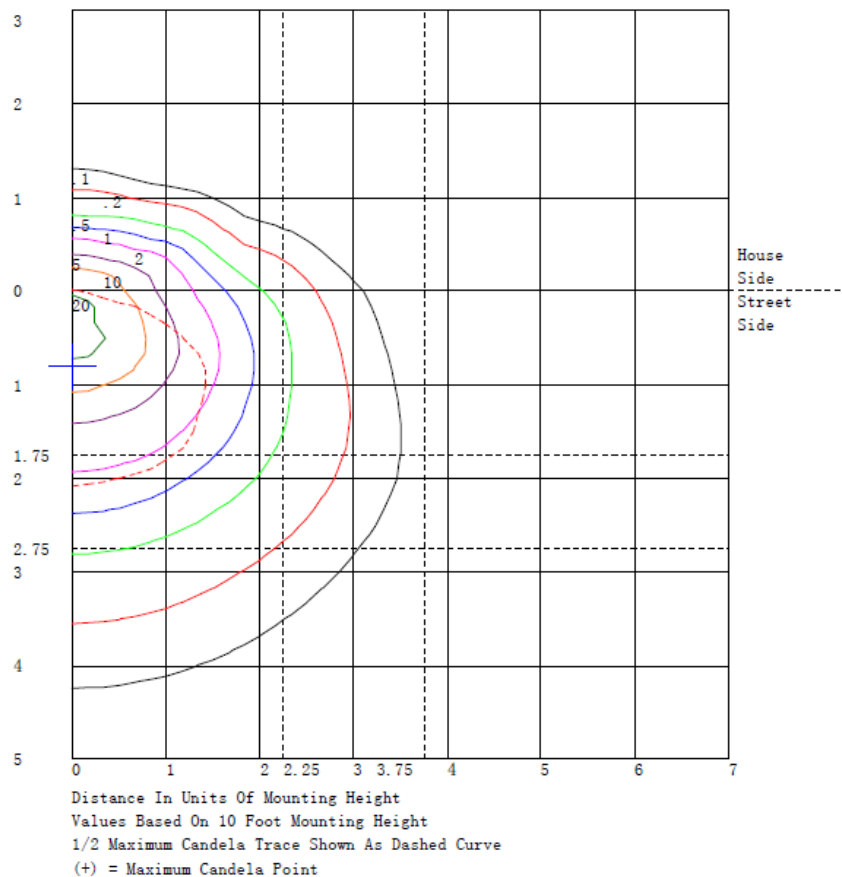
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1004.7	N.A.	16.1
FM - Front-Medium (30-60)	2840.8	N.A.	45.6
FH - Front-High (60-80)	1143.5	N.A.	18.4
FVH - Front-Very High (80-90)	168.4	N.A.	2.7
BL - Back-Low (0-30)	453.7	N.A.	7.3
BM - Back-Medium (30-60)	390.1	N.A.	6.3
BH - Back-High (60-80)	66.2	N.A.	1.1
BVH - Back-Very High (80-90)	7.5	N.A.	0.1
UL - Uplight-Low (90-100)	69.8	N.A.	1.1
UH - Uplight-High (100-180)	82.4	N.A.	1.3
Total	6227.1	N.A.	100.0
BUG Rating	B1-U3-G2		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

C (DEG)																			UNIT: cd	
γ (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
0	1906	1907	1908	1910	1911	1913	1914	1916	1918	1920	1922	1924	1926	1927	1928	1929	1931	1934	1935	
5	1867	1861	1866	1882	1926	1969	2000	1972	1936	1906	1935	1974	2012	2014	2009	2002	2007	2015	2023	
10	1828	1896	1947	1981	1980	1976	1981	2043	2119	2199	2264	2319	2360	2372	2369	2357	2339	2319	2303	
15	1754	1766	1801	1859	1960	2069	2171	2221	2254	2277	2299	2318	2334	2354	2371	2382	2381	2375	2366	
20	1653	1703	1768	1848	1959	2074	2182	2252	2306	2349	2374	2403	2449	2568	2693	2804	2837	2844	2833	
25	1572	1709	1836	1953	2060	2157	2246	2304	2369	2458	2637	2834	3025	3165	3274	3348	3356	3339	3313	
30	1475	1677	1845	1979	2044	2103	2184	2388	2616	2840	2990	3117	3228	3349	3453	3533	3557	3559	3550	
35	1364	1561	1744	1912	2050	2186	2331	2527	2734	2941	3132	3306	3455	3560	3636	3685	3705	3706	3694	
40	1218	1438	1648	1850	2031	2211	2399	2639	2877	3096	3242	3362	3464	3585	3688	3759	3750	3718	3680	
45	1083	1278	1484	1701	1939	2181	2419	2654	2865	3039	3132	3186	3214	3237	3247	3248	3243	3236	3230	
50	920	1083	1279	1507	1807	2110	2387	2566	2696	2783	2817	2828	2833	2881	2929	2969	2968	2957	2944	
55	789	926	1097	1302	1580	1862	2119	2267	2371	2440	2502	2541	2554	2526	2484	2443	2437	2441	2450	
60	654	829	1008	1191	1396	1592	1769	1893	1987	2055	2087	2107	2127	2186	2246	2297	2304	2298	2289	
65	550	728	891	1039	1168	1286	1396	1517	1626	1714	1750	1766	1771	1784	1795	1805	1816	1826	1834	
70	398	492	595	708	842	976	1101	1195	1269	1322	1339	1341	1337	1345	1354	1362	1366	1370	1375	
75	295	334	389	459	562	667	764	816	851	872	883	889	893	907	922	936	941	943	943	
80	217	216	231	261	316	379	443	496	540	574	587	592	594	604	616	628	642	654	663	
85	85.7	85.1	94.8	115	150	192	236	272	306	336	360	380	398	414	428	439	446	450	453	
90	20.5	31.4	44.3	59.0	76.5	95.3	115	133	152	171	194	217	239	257	273	287	296	302	305	
95	16.7	23.1	29.9	37.2	44.9	53.0	61.8	70.8	81.0	92.9	109	126	144	163	181	197	207	213	216	
100	17.2	18.2	19.6	21.6	22.6	25.1	30.1	39.6	52.9	70.6	94.9	123	153	186	217	244	262	272	276	
105	11.3	12.5	13.5	14.5	14.8	15.6	17.2	21.8	27.2	32.7	34.9	37.9	43.3	57.8	73.5	87.6	92.8	94.8	94.5	
110	14.9	11.0	10.1	12.0	20.2	28.9	35.4	29.8	22.6	17.2	24.0	33.1	42.2	44.2	44.6	44.2	45.5	46.6	47.3	
115	11.7	7.84	7.01	9.20	16.8	25.6	33.9	37.6	38.9	37.3	29.0	20.4	14.2	19.2	27.0	35.6	40.5	43.7	44.7	
120	8.24	5.02	4.71	7.32	14.6	23.5	32.6	39.2	44.5	48.3	50.8	51.2	49.1	41.1	32.1	23.7	20.9	20.1	20.8	
125	6.40	3.51	3.31	5.79	12.4	20.6	29.3	36.3	42.5	47.7	51.5	53.9	55.1	54.2	52.5	50.3	48.4	46.8	46.0	
130	4.76	2.44	2.33	4.42	9.87	16.7	24.0	29.8	35.3	40.2	44.7	48.4	51.0	51.5	51.0	50.0	49.1	48.2	47.7	
135	1.57	0.00	0.00	0.99	6.24	12.7	19.5	24.3	28.6	32.6	37.0	41.0	44.1	45.1	45.3	45.1	45.1	45.2	45.2	
140	1.51	2.32	3.67	5.56	8.16	11.2	14.5	18.0	21.6	25.1	28.4	31.4	33.9	35.6	36.8	37.7	38.9	39.0	39.3	
145	1.38	1.62	2.33	3.52	5.30	7.47	9.95	12.7	15.6	18.3	20.5	22.5	24.2	25.7	26.9	28.1	29.2	30.2	30.8	
150	0.99	0.96	0.93	0.91	0.30	0.13	0.83	4.36	8.50	12.5	14.5	15.9	16.8	17.8	18.6	19.3	20.1	20.8	21.2	
155	1.08	0.95	0.98	1.19	1.52	2.06	2.87	4.22	5.74	7.32	8.73	10.0	11.1	11.9	12.4	12.9	13.4	13.9	14.1	
160	1.19	1.12	1.10	1.14	1.30	1.46	1.56	1.27	1.02	0.99	1.65	2.61	3.79	5.23	6.64	7.85	8.33	8.52	8.51	
165	1.27	1.27	1.27	1.27	1.22	1.19	1.20	1.30	1.46	1.70	2.19	2.62	2.86	2.36	1.71	1.07	0.95	0.96	1.05	
170	1.37	1.37	1.38	1.37	1.37	1.36	1.34	1.31	1.28	1.25	1.22	1.20	1.22	1.32	1.43	1.53	1.54	1.53	1.51	
175	1.44	1.45	1.46	1.46	1.46	1.45	1.45	1.44	1.44	1.43	1.42	1.41	1.40	1.38	1.36	1.34	1.31	1.28	1.27	
180	1.66	1.67	1.67	1.67	1.66	1.65	1.64	1.63	1.62	1.60	1.58	1.56	1.53	1.50	1.48	1.45	1.42	1.39	1.37	

																			UNIT: cd	
γ (DEG)	C (DEG)																			
	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	
0	1934	1931	1929	1928	1927	1926	1924	1922	1920	1918	1916	1914	1913	1911	1910	1908	1907	1906	1919	
5	2015	2007	2002	2009	2014	2012	1974	1935	1906	1936	1972	2000	1969	1926	1882	1866	1861	1867	1846	
10	2319	2339	2357	2369	2372	2360	2319	2264	2199	2119	2043	1981	1976	1980	1981	1947	1896	1828	1767	
15	2375	2381	2382	2371	2354	2334	2318	2299	2277	2254	2221	2171	2069	1960	1859	1801	1766	1754	1625	
20	2844	2837	2804	2693	2568	2449	2403	2374	2349	2306	2252	2182	2074	1959	1848	1768	1703	1653	1507	
25	3339	3356	3348	3274	3165	3025	2834	2637	2458	2369	2304	2246	2157	2060	1953	1836	1709	1572	1512	
30	3559	3557	3533	3453	3349	3228	3117	2990	2840	2616	2388	2184	2103	2044	1979	1845	1677	1545	1455	
35	3706	3705	3685	3636	3560	3455	3306	3132	2941	2734	2527	2331	2186	2050	1912	1744	1561	1364	1359	
40	3718	3750	3759	3688	3585	3464	3362	3242	3096	2877	2639	2399	2211	2031	1850	1648	1438	1218	1203	
45	3236	3243	3248	3247	3237	3214	3186	3132	3039	2865	2654	2419	2181	1939	1701	1484	1278	1083	1035	
50	2957	2968	2969	2929	2881	2833	2828	2817	2783	2696	2566	2387	2110	1807	1507	1279	1083	920	812	
55	2441	2437	2443	2484	2526	2554	2541	2502	2440	2371	2267	2119	1862	1580	1302	1097	926	789	640	
60	2298	2304	2297	2246	2186	2127	2107	2087	2055	1987	1893	1769	1592	1396	1191	1008	829	654	487	
65	1826	1816	1805	1795	1784	1771	1766	1750	1714	1626	1517	1396	1286	1168	1039	891	728	550	402	
70	1370	1366	1362	1354	1345	1337	1341	1339	1322	1269	1195	1101	976	842	708	595	492	398	298	
75	943	941	936	922	907	893	889	883	872	851	816	764	667	562	459	389	334	295	212	
80	654	642	628	616	604	594	592	587	574	540	496	443	379	316	261	231	216	217	147	
85	450	446	439	428	414	398	380	360	336	306	272	236	192	150	115	94.8	85.1	85.7	61.4	
90	302	296	287	273	257	239	217	194	171	152	133	115	95.3	76.5	59.0	44.3	31.4	20.5	18.7	
95	213	207	197	181	163	144	126	109	92.9	81.0	70.8	61.8	53.0	44.9	37.2	29.9	23.1	16.7	14.4	
100	272	262	244	217	186	153	123	94.9	70.6	52.9	39.6	30.1	25.1	22.6	21.6	19.6	18.2	17.2	13.7	
105	94.8	92.8	87.6	73.5	57.8	43.3	37.9	34.9	32.7	27.2	21.8	17.2	15.6	14.8	14.5	13.5	12.5	11.3	8.84	
110	46.6	45.5	44.2	44.6	44.2	42.2	39.1	24.0	17.2	22.6	29.8	35.4	28.9	20.2	12.0	10.1	11.0	14.9	10.8	
115	43.7	40.5	35.6	27.0	19.2	14.2	20.4	29.0	37.3	38.9	37.6	33.9	25.6	16.8	9.20	7.01	7.84	11.7	8.57	
120	20.1	20.9	23.7	32.1	41.1	49.1	51.2	50.8	48.3	44.5	39.2	32.6	23.5	14.6	7.32	4.71	5.02	8.24	6.40	
125	46.8	48.4	50.3	52.5	54.2	55.1	53.9	51.5	47.7	42.5	36.3	29.3	20.6	12.4	5.79	3.31	3.51	6.40	5.08	
130	48.2	49.1	50.0	51.0	51.5	51.0	48.4	44.7	40.2	35.3	29.8	24.0	16.7	9.87	4.42	2.33	2.44	4.76	3.97	
135	45.2	45.1	45.1	45.3	45.1	44.1	41.0	37.0	32.6	28.6	24.3	19.5	12.7	6.24	0.99	0.00	0.00	1.57	1.99	
140	39.0	38.5	37.7	36.8	35.6	33.9	31.4	28.4	25.1	21.6	18.0	14.5	11.2	8.16	5.56	3.67	2.32	1.51	1.77	
145	30.2	29.2	28.1	26.9	25.7	24.2	22.5	20.5	18.3	15.6	12.7	9.95	7.47	5.30	3.52	2.33	1.62	1.38	1.66	
150	20.8	20.1	19.3	18.6	17.8	16.8	15.9	14.5	12.5	8.50	4.36	0.83	0.13	0.30	0.91	0.93	0.96	0.91	1.44	
155	13.9	13.4	12.9	12.4	11.9	11.1	10.0	8.73	7.32	5.74	4.22	2.87	2.06	1.52	1.19	0.98	0.95	1.08	1.55	
160	8.52	8.33	7.85	6.64	5.23	3.79	2.61	1.65	0.99	1.02	1.27	1.56	1.46	1.30	1.14	1.10	1.12	1.19	1.77	
165	0.96	0.95	1.07	1.71	2.36	2.86	2.62	2.19	1.70	1.46	1.30	1.20	1.19	1.22	1.27	1.27	1.27	1.27	1.77	
170	1.53	1.54	1.53	1.43	1.32	1.22	1.20	1.22	1.25	1.28	1.31	1.34	1.36	1.37	1.37	1.38	1.37	1.37	1.77	
175	1.28	1.31	1.34	1.36	1.38	1.40	1.42	1.43	1.43	1.44	1.44	1.45	1.45	1.46	1.46	1.46	1.45	1.44	1.66	
180	1.39	1.42	1.45	1.48	1.50	1.53	1.56	1.58	1.60	1.62	1.63	1.64	1.65	1.66	1.67	1.67	1.67	1.66	1.66	

Table--3

UNIT: cd

C (DEG) y	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	1928	1935	1937	1938	1937	1937	1937	1937	1937	1937	1937	1937	1936	1935	1935	1936	1935	1936	1935
5	1821	1794	1762	1727	1691	1650	1612	1584	1584	1590	1593	1570	1541	1514	1503	1497	1496	1497	1503
10	1705	1642	1565	1496	1444	1439	1451	1472	1491	1505	1509	1474	1433	1399	1410	1428	1445	1428	1410
15	1526	1457	1430	1423	1427	1430	1427	1410	1347	1274	1204	1171	1148	1132	1112	1097	1090	1097	1112
20	1399	1329	1327	1341	1347	1276	1186	1085	997	912	829	745	669	607	572	553	549	553	572
25	1448	1381	1319	1248	1160	1023	875	732	620	529	459	428	414	411	402	398	396	398	402
30	1408	1325	1194	1042	880	713	561	436	389	369	364	341	321	305	294	288	286	288	294
35	1304	1198	1001	786	582	478	407	359	312	275	246	218	195	177	167	162	161	162	167
40	1141	1030	827	609	410	329	283	258	213	173	140	119	105	96.8	91.8	90.0	90.6	90.0	91.8
45	956	847	675	496	332	251	199	166	133	108	91.0	82.5	78.9	78.2	75.9	74.5	74.2	74.5	75.9
50	703	594	474	361	261	193	143	108	86.7	75.0	69.1	61.7	56.4	53.0	51.2	50.6	51.0	50.6	51.2
55	510	399	311	239	182	136	101	76.4	59.7	49.4	43.6	39.4	37.4	36.8	35.9	35.5	35.6	35.5	35.9
60	350	245	182	142	117	87.7	64.5	46.9	36.1	29.5	25.6	21.7	19.1	17.5	16.2	15.6	15.7	15.6	16.2
65	282	189	131	93.6	70.7	49.5	34.5	23.9	13.9	6.41	1.45	0.00	0.00	0.58	0.58	0.66	0.78	0.66	0.58
70	214	147	99.7	65.8	42.4	24.5	12.8	5.99	2.00	0.51	0.57	0.26	0.36	0.69	0.78	0.89	1.01	0.89	0.78
75	143	89.5	55.7	33.9	21.1	11.4	6.06	3.66	1.64	0.80	0.72	0.54	0.59	0.78	0.91	1.07	1.23	1.07	0.91
80	91.6	50.3	28.2	16.6	11.9	6.62	3.77	2.55	1.44	0.97	0.90	0.78	0.79	0.91	1.06	1.24	1.41	1.24	1.06
85	41.6	26.4	17.0	11.0	7.56	4.63	2.85	1.92	1.30	1.07	1.08	1.01	1.01	1.07	1.18	1.32	1.46	1.32	1.18
90	16.6	14.2	11.1	8.04	5.29	3.62	2.46	1.73	1.36	1.24	1.27	1.24	1.25	1.29	1.35	1.42	1.52	1.42	1.35
95	12.2	10.1	7.94	6.01	4.35	3.20	2.36	1.80	1.54	1.46	1.48	1.46	1.47	1.50	1.53	1.57	1.65	1.57	1.53
100	10.7	8.15	6.15	4.60	3.46	2.77	2.38	2.19	2.04	1.98	1.97	1.91	1.87	1.85	1.85	1.88	1.95	1.88	1.85
105	6.70	4.90	3.43	2.32	1.60	1.51	1.68	1.97	2.04	2.10	2.13	2.11	2.09	2.07	2.09	2.13	2.20	2.13	2.09
110	7.44	4.94	3.56	2.79	2.44	2.07	1.87	1.79	1.80	1.87	1.97	2.05	2.13	2.19	2.20	2.19	2.19	2.19	2.20
115	6.07	4.18	3.06	2.42	2.10	1.86	1.76	1.77	1.80	1.87	1.94	1.97	1.99	2.00	2.02	2.05	2.08	2.05	2.02
120	4.87	3.65	2.78	2.18	1.81	1.66	1.64	1.72	1.78	1.86	1.95	1.99	2.02	2.05	2.09	2.12	2.14	2.12	2.09
125	3.97	3.09	2.45	2.01	1.74	1.64	1.66	1.74	1.83	1.94	2.04	2.09	2.12	2.15	2.20	2.25	2.28	2.25	2.20
130	3.19	2.60	2.16	1.85	1.66	1.63	1.69	1.79	1.88	1.97	2.06	2.15	2.22	2.30	2.37	2.43	2.47	2.43	2.37
135	2.22	2.31	2.14	1.89	1.66	1.67	1.74	1.86	1.95	2.05	2.15	2.22	2.29	2.35	2.40	2.45	2.47	2.45	2.40
140	1.96	2.04	1.98	1.87	1.76	1.80	1.86	1.95	2.01	2.08	2.15	2.22	2.29	2.36	2.42	2.47	2.52	2.47	2.42
145	1.80	1.91	1.94	1.94	1.92	1.96	2.01	2.06	2.13	2.21	2.27	2.31	2.34	2.37	2.43	2.49	2.54	2.49	2.43
150	1.71	1.94	2.03	2.06	2.05	2.09	2.13	2.17	2.21	2.25	2.28	2.31	2.34	2.37	2.42	2.47	2.51	2.47	2.42
155	1.92	2.17	2.27	2.29	2.27	2.24	2.21	2.18	2.19	2.21	2.24	2.28	2.31	2.34	2.35	2.35	2.35	2.35	2.35
160	2.10	2.36	2.45	2.45	2.39	2.34	2.29	2.24	2.24	2.25	2.26	2.23	2.21	2.18	2.19	2.20	2.21	2.20	2.19
165	2.15	2.40	2.45	2.42	2.34	2.29	2.23	2.18	2.13	2.08	2.04	1.99	1.95	1.92	1.93	1.95	1.98	1.95	1.93
170	2.05	2.22	2.23	2.17	2.06	1.94	1.83	1.74	1.72	1.72	1.74	1.72	1.70	1.69	1.68	1.68	1.69	1.68	1.68
175	1.87	1.99	2.02	2.00	1.94	1.84	1.73	1.64	1.62	1.62	1.62	1.57	1.52	1.49	1.51	1.54	1.58	1.54	1.51
180	1.65	1.64	1.64	1.63	1.62	1.59	1.56	1.52	1.49	1.45	1.42	1.40	1.39	1.39	1.40	1.43	1.45	1.43	1.40

																UNIT: cd			
C (DEG) γ		285	290	295	300	305	310	315	320	325	330	335	340	345	350	355			
0		1935	1936	1937	1937	1937	1937	1937	1937	1937	1937	1938	1937	1935	1928	1919			
5		1514	1541	1570	1593	1590	1584	1584	1612	1650	1691	1727	1762	1794	1821	1846			
10		1399	1433	1474	1509	1505	1491	1472	1451	1439	1444	1496	1565	1642	1705	1767			
15		1132	1148	1171	1204	1274	1347	1410	1427	1430	1427	1423	1430	1457	1526	1625			
20		607	669	745	829	912	997	1085	1186	1276	1347	1341	1327	1329	1399	1507			
25		411	414	428	459	529	620	732	875	1023	1160	1248	1319	1381	1448	1512			
30		305	321	341	364	369	389	436	561	713	880	1042	1194	1325	1408	1458			
35		177	195	218	246	275	312	359	407	478	582	786	1001	1198	1304	1359			
40		96.8	105	119	140	173	213	258	283	329	410	609	827	1030	1141	1203			
45		78.2	78.9	82.5	91.0	108	133	166	199	251	332	496	675	847	956	1035			
50		53.0	56.4	61.7	69.1	75.0	86.7	108	143	193	261	361	474	594	703	812			
55		36.8	37.4	39.4	43.6	49.4	59.7	76.4	101	136	182	239	311	399	510	640			
60		17.5	19.1	21.7	25.6	29.5	36.1	46.9	64.5	87.7	117	142	182	245	350	487			
65		0.58	0.00	0.00	1.45	6.41	13.9	23.9	34.5	49.5	70.7	93.6	131	189	282	402			
70		0.69	0.36	0.26	0.57	0.51	2.00	5.99	12.8	24.5	42.4	65.8	99.7	147	214	298			
75		0.78	0.59	0.54	0.72	0.80	1.64	3.66	6.06	11.4	21.1	33.9	55.7	89.5	143	212			
80		0.91	0.79	0.78	0.90	0.97	1.44	2.55	3.77	6.62	11.9	16.6	28.2	50.3	91.6	147			
85		1.07	1.01	1.01	1.08	1.07	1.30	1.92	2.85	4.63	7.56	11.0	17.0	26.4	41.6	61.4			
90		1.29	1.25	1.24	1.27	1.24	1.36	1.73	2.46	3.62	5.29	8.04	11.1	14.2	16.6	18.7			
95		1.50	1.47	1.46	1.48	1.46	1.54	1.80	2.36	3.20	4.35	6.01	7.94	10.1	12.2	14.4			
100		1.85	1.87	1.91	1.97	1.98	2.04	2.19	2.38	2.77	3.46	4.60	6.15	8.15	10.7	13.7			
105		2.07	2.09	2.11	2.13	2.10	2.04	1.97	1.68	1.51	1.60	2.32	3.43	4.90	6.70	8.84			
110		2.19	2.13	2.05	1.97	1.87	1.80	1.79	1.87	2.07	2.44	2.79	3.56	4.94	7.44	10.8			
115		2.00	1.99	1.97	1.94	1.87	1.80	1.77	1.76	1.86	2.10	2.42	3.06	4.18	6.07	8.57			
120		2.05	2.02	1.99	1.95	1.86	1.78	1.72	1.64	1.66	1.81	2.18	2.78	3.65	4.87	6.40			
125		2.15	2.12	2.09	2.04	1.94	1.83	1.74	1.66	1.64	1.74	2.01	2.45	3.09	3.97	5.08			
130		2.30	2.22	2.15	2.06	1.97	1.88	1.79	1.69	1.63	1.66	1.85	2.16	2.60	3.19	3.91			
135		2.35	2.29	2.22	2.15	2.05	1.95	1.86	1.74	1.67	1.66	1.89	2.14	2.31	2.22	1.97			
140		2.36	2.29	2.22	2.15	2.08	2.01	1.95	1.86	1.80	1.76	1.87	1.98	2.04	1.96	1.78			
145		2.37	2.34	2.31	2.27	2.21	2.13	2.06	2.01	1.96	1.92	1.94	1.94	1.91	1.80	1.62			
150		2.37	2.34	2.31	2.28	2.25	2.21	2.17	2.13	2.09	2.05	2.06	2.03	1.94	1.71	1.40			
155		2.34	2.31	2.28	2.24	2.21	2.19	2.18	2.21	2.24	2.27	2.29	2.27	2.17	1.92	1.56			
160		2.18	2.21	2.23	2.26	2.25	2.24	2.24	2.29	2.34	2.39	2.45	2.45	2.36	2.10	1.71			
165		1.92	1.95	1.99	2.04	2.08	2.13	2.18	2.23	2.29	2.34	2.42	2.45	2.40	2.15	1.78			
170		1.69	1.70	1.72	1.74	1.72	1.72	1.74	1.83	1.94	2.06	2.17	2.23	2.22	2.05	1.76			
175		1.49	1.52	1.57	1.62	1.62	1.62	1.64	1.73	1.84	1.94	2.00	2.02	1.99	1.87	1.69			
180		1.39	1.39	1.40	1.42	1.45	1.49	1.52	1.56	1.59	1.62	1.63	1.64	1.64	1.65	1.65			

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	WPX2 @ 40W / 5000K 480	Sample ID	231101004-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(%)
480.0	60	0.113	42.6	0.787	15.54

5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2023-11-08	2024-11-07
NTC-F01-006	2.0 meter Integrating Sphere	2023-11-08	2024-11-07
NTC-F01-012	Standard Lamp	2023-11-02	2024-11-01
NTC-F01-013	Standard Lamp	2023-11-02	2024-11-01
NTC-F01-031	Digital Power Meter	2023-08-25	2024-08-24
NTC-F01-019	Temperature & Humidity Meter	2023-11-06	2024-11-05

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