

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

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Issue Date: 2023-11-16
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		6033
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		142.0
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		5880
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	138.4
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		42.5
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	480V	16.03
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	3045±175	3105
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		82.5
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		10
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		84
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%		-12%
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		42.5
(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 / 3000K 480	231101004-S1
2	Goniophotometer Test	2023-11-08	WPX2 @ 40W / 3000K 480	231101004-S1
3	THD and PF Test	2023-11-08	WPX2 @ 40W / 3000K 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 / 3000K 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 / 3000K 480	Sample ID	231101004-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

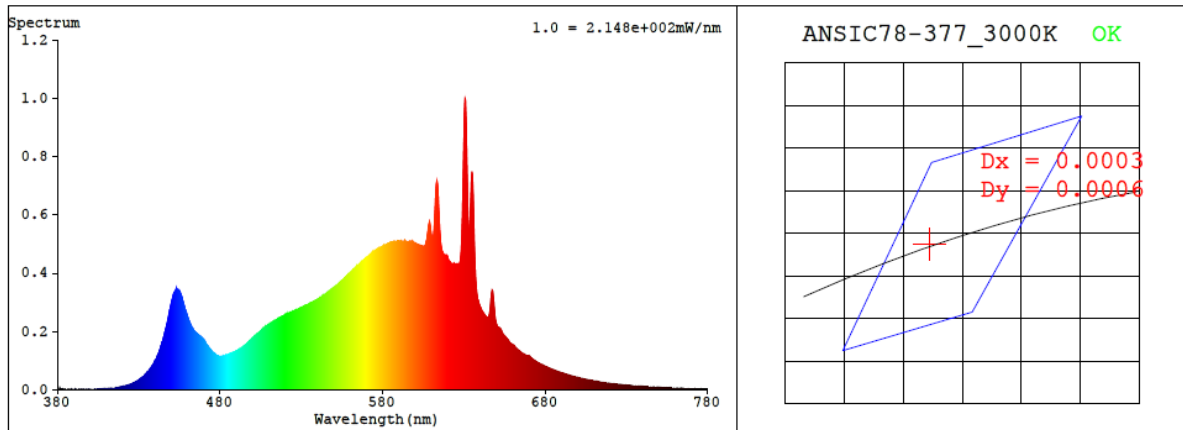
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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. 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	42.5	0.787

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3105	82.5	10	0.0002	84	95	-12%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4299$ $y = 0.4020$ / $u' = 0.2469$ $v' = 0.5195$ ($duv=1.98e-04$)

CCT= 3105K Prcp WL: $L_d=582.3nm$ Purity=49.7%

Peak WL: $L_p=631nm$ FWHM: $=8.3nm$ Ratio:R=22.3% G=75.0% B=2.7%

Render Index: $R_a = 82.5$ AvgR = 76.5 TM30:Rf=83 Rg=95

EEL: 0.09786 A++ Highest

R1 =81	R2 =91	R3 =96	R4 =79	R5 =80	R6 =88	R7 =83
R8 =61	R9 =10	R10=78	R11=77	R12=67	R13=83	R14=99 R15=74

4.1 Integrating Sphere Test

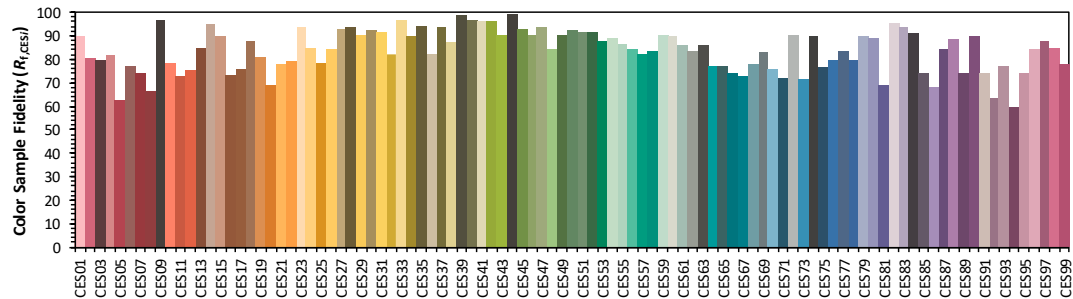
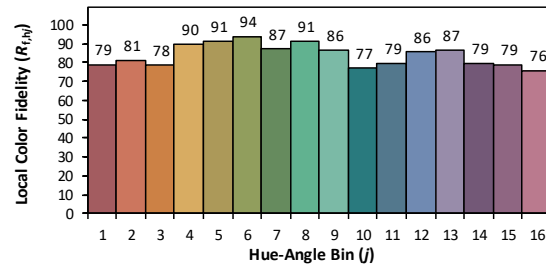
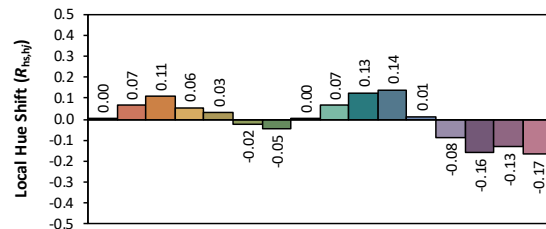
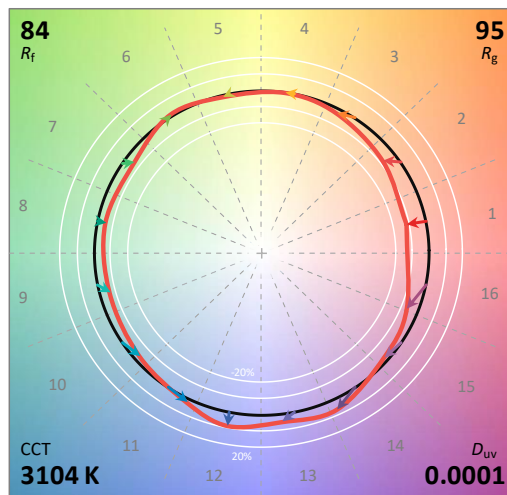
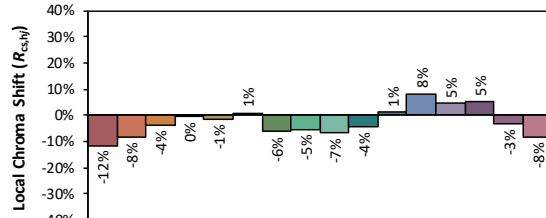
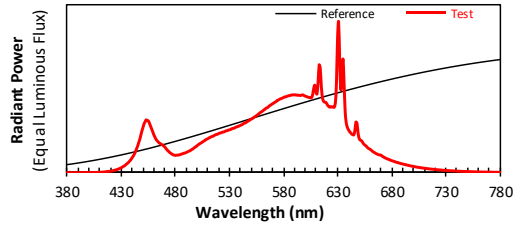
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/11/16

Model: WPX2 @ 40W / 3000K 480



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

x 0.4299
 y 0.4019
 u' 0.2470
 v' 0.5195

CIE 13.3-1995
(CRI)

R_a 82
 R_g 10

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	2.00E-06	447	2.19E-04	514	2.38E-04	581	4.97E-04	648	3.24E-04	715	2.57E-05
381	0.00E+00	448	2.46E-04	515	2.40E-04	582	4.97E-04	649	2.61E-04	716	2.50E-05
382	3.60E-06	449	2.74E-04	516	2.46E-04	583	5.01E-04	650	2.26E-04	717	2.40E-05
383	2.70E-06	450	2.97E-04	517	2.48E-04	584	5.02E-04	651	2.14E-04	718	2.34E-05
384	6.00E-07	451	3.20E-04	518	2.52E-04	585	5.05E-04	652	2.11E-04	719	2.26E-05
385	9.00E-07	452	3.34E-04	519	2.53E-04	586	5.06E-04	653	2.02E-04	720	2.19E-05
386	6.00E-07	453	3.47E-04	520	2.57E-04	587	5.09E-04	654	1.91E-04	721	2.09E-05
387	0.00E+00	454	3.42E-04	521	2.60E-04	588	5.09E-04	655	1.84E-04	722	2.04E-05
388	0.00E+00	455	3.40E-04	522	2.61E-04	589	5.11E-04	656	1.78E-04	723	1.97E-05
389	7.00E-07	456	3.24E-04	523	2.64E-04	590	5.11E-04	657	1.71E-04	724	1.91E-05
390	2.00E-07	457	3.06E-04	524	2.67E-04	591	5.11E-04	658	1.63E-04	725	1.87E-05
391	1.70E-06	458	2.88E-04	525	2.68E-04	592	5.09E-04	659	1.59E-04	726	1.80E-05
392	6.00E-07	459	2.69E-04	526	2.72E-04	593	5.08E-04	660	1.54E-04	727	1.71E-05
393	1.10E-06	460	2.50E-04	527	2.75E-04	594	5.09E-04	661	1.50E-04	728	1.66E-05
394	1.40E-06	461	2.35E-04	528	2.76E-04	595	5.07E-04	662	1.43E-04	729	1.59E-05
395	1.50E-06	462	2.20E-04	529	2.80E-04	596	5.07E-04	663	1.38E-04	730	1.57E-05
396	1.00E-06	463	2.11E-04	530	2.81E-04	597	5.10E-04	664	1.33E-04	731	1.51E-05
397	7.00E-07	464	2.03E-04	531	2.83E-04	598	5.10E-04	665	1.29E-04	732	1.48E-05
398	1.90E-06	465	1.96E-04	532	2.88E-04	599	5.06E-04	666	1.25E-04	733	1.44E-05
399	1.00E-06	466	1.91E-04	533	2.90E-04	600	5.03E-04	667	1.22E-04	734	1.35E-05
400	1.80E-06	467	1.87E-04	534	2.92E-04	601	5.00E-04	668	1.19E-04	735	1.32E-05
401	1.90E-06	468	1.83E-04	535	2.95E-04	602	4.97E-04	669	1.17E-04	736	1.27E-05
402	1.40E-06	469	1.76E-04	536	2.99E-04	603	4.95E-04	670	1.16E-04	737	1.25E-05
403	1.80E-06	470	1.71E-04	537	3.02E-04	604	4.93E-04	671	1.11E-04	738	1.21E-05
404	1.80E-06	471	1.62E-04	538	3.04E-04	605	4.92E-04	672	1.06E-04	739	1.19E-05
405	2.40E-06	472	1.53E-04	539	3.07E-04	606	4.93E-04	673	1.02E-04	740	1.15E-05
406	2.30E-06	473	1.45E-04	540	3.10E-04	607	5.12E-04	674	9.81E-05	741	1.07E-05
407	2.40E-06	474	1.39E-04	541	3.14E-04	608	5.54E-04	675	9.45E-05	742	1.06E-05
408	3.00E-06	475	1.31E-04	542	3.17E-04	609	5.73E-04	676	9.15E-05	743	1.05E-05
409	3.00E-06	476	1.27E-04	543	3.22E-04	610	5.32E-04	677	8.85E-05	744	9.70E-06
410	3.00E-06	477	1.22E-04	544	3.26E-04	611	5.17E-04	678	8.59E-05	745	9.70E-06
411	4.40E-06	478	1.18E-04	545	3.28E-04	612	5.93E-04	679	8.27E-05	746	9.30E-06
412	3.70E-06	479	1.16E-04	546	3.33E-04	613	7.06E-04	680	8.00E-05	747	8.90E-06
413	4.70E-06	480	1.14E-04	547	3.37E-04	614	6.84E-04	681	7.76E-05	748	8.60E-06
414	5.40E-06	481	1.15E-04	548	3.42E-04	615	5.67E-04	682	7.53E-05	749	8.50E-06
415	5.90E-06	482	1.16E-04	549	3.46E-04	616	4.95E-04	683	7.27E-05	750	8.40E-06
416	7.30E-06	483	1.17E-04	550	3.51E-04	617	4.70E-04	684	7.02E-05	751	8.00E-06
417	8.10E-06	484	1.18E-04	551	3.55E-04	618	4.63E-04	685	6.81E-05	752	7.60E-06
418	8.70E-06	485	1.21E-04	552	3.59E-04	619	4.61E-04	686	6.62E-05	753	7.50E-06
419	1.00E-05	486	1.24E-04	553	3.65E-04	620	4.53E-04	687	6.39E-05	754	7.30E-06
420	1.05E-05	487	1.26E-04	554	3.69E-04	621	4.41E-04	688	6.19E-05	755	7.00E-06
421	1.17E-05	488	1.29E-04	555	3.75E-04	622	4.34E-04	689	6.00E-05	756	6.80E-06
422	1.37E-05	489	1.30E-04	556	3.80E-04	623	4.29E-04	690	5.83E-05	757	6.70E-06
423	1.51E-05	490	1.33E-04	557	3.85E-04	624	4.34E-04	691	5.64E-05	758	6.50E-06
424	1.74E-05	491	1.36E-04	558	3.91E-04	625	4.30E-04	692	5.46E-05	759	6.20E-06
425	1.93E-05	492	1.40E-04	559	3.97E-04	626	4.31E-04	693	5.30E-05	760	6.00E-06
426	2.13E-05	493	1.43E-04	560	4.01E-04	627	4.30E-04	694	5.14E-05	761	5.60E-06
427	2.40E-05	494	1.47E-04	561	4.06E-04	628	4.58E-04	695	4.94E-05	762	5.40E-06
428	2.67E-05	495	1.52E-04	562	4.12E-04	629	5.87E-04	696	4.79E-05	763	5.40E-06
429	3.02E-05	496	1.56E-04	563	4.17E-04	630	8.77E-04	697	4.62E-05	764	5.10E-06
430	3.36E-05	497	1.61E-04	564	4.24E-04	631	9.89E-04	698	4.47E-05	765	5.10E-06
431	3.83E-05	498	1.67E-04	565	4.27E-04	632	7.40E-04	699	4.31E-05	766	5.10E-06
432	4.22E-05	499	1.71E-04	566	4.32E-04	633	5.47E-04	700	4.20E-05	767	4.80E-06
433	4.64E-05	500	1.77E-04	567	4.39E-04	634	6.22E-04	701	4.07E-05	768	4.80E-06
434	5.23E-05	501	1.83E-04	568	4.43E-04	635	7.46E-04	702	3.91E-05	769	4.30E-06
435	5.87E-05	502	1.88E-04	569	4.48E-04	636	5.99E-04	703	3.77E-05	770	4.30E-06
436	6.43E-05	503	1.93E-04	570	4.52E-04	637	4.10E-04	704	3.66E-05	771	4.20E-06
437	7.11E-05	504	1.97E-04	571	4.57E-04	638	3.31E-04	705	3.54E-05	772	4.40E-06
438	7.98E-05	505	2.02E-04	572	4.62E-04	639	3.00E-04	706	3.45E-05	773	4.00E-06
439	8.83E-05	506	2.07E-04	573	4.65E-04	640	2.83E-04	707	3.33E-05	774	3.80E-06
440	9.95E-05	507	2.10E-04	574	4.73E-04	641	2.72E-04	708	3.23E-05	775	3.70E-06
441	1.10E-04	508	2.17E-04	575	4.75E-04	642	2.63E-04	709	3.15E-05	776	3.70E-06
442	1.23E-04	509	2.20E-04	576	4.80E-04	643	2.55E-04	710	3.00E-05	777	3.60E-06
443	1.38E-04	510	2.24E-04	577	4.84E-04	644	2.50E-04	711	2.93E-05	778	3.60E-06
444	1.56E-04	511	2.28E-04	578	4.86E-04	645	2.49E-04	712	2.86E-05	779	3.50E-06
445	1.74E-04	512	2.31E-04	579	4.90E-04	646	2.73E-04	713	2.74E-05	780	3.50E-06
446	1.97E-04	513	2.36E-04	580	4.93E-04	647	3.32E-04	714	2.62E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	WPX2 @ 40W / 3000K 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	42.5	0.787
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

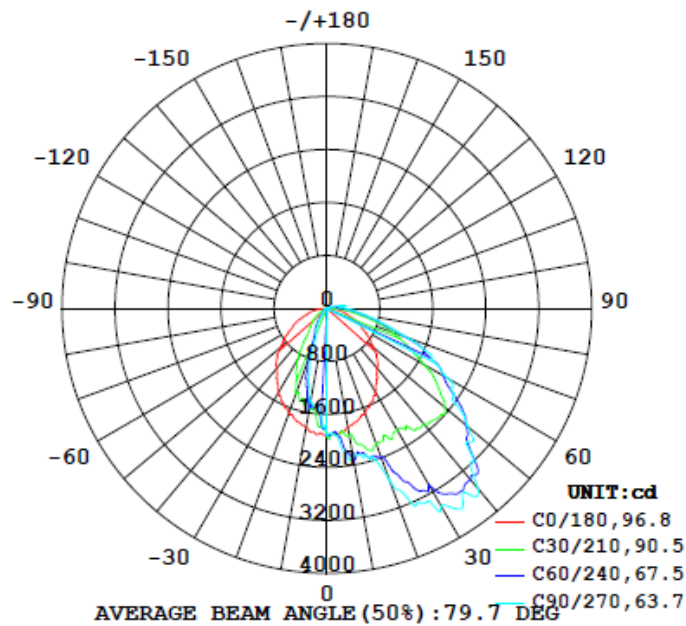
Test Result

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	6033	113.5	146.8	64.6	96.4	142.0	2.8%	B1-U3-G2
0°-90° zones	5880	113.5	146.8	64.6	96.4	138.4	2.9%	B1-U3-G2

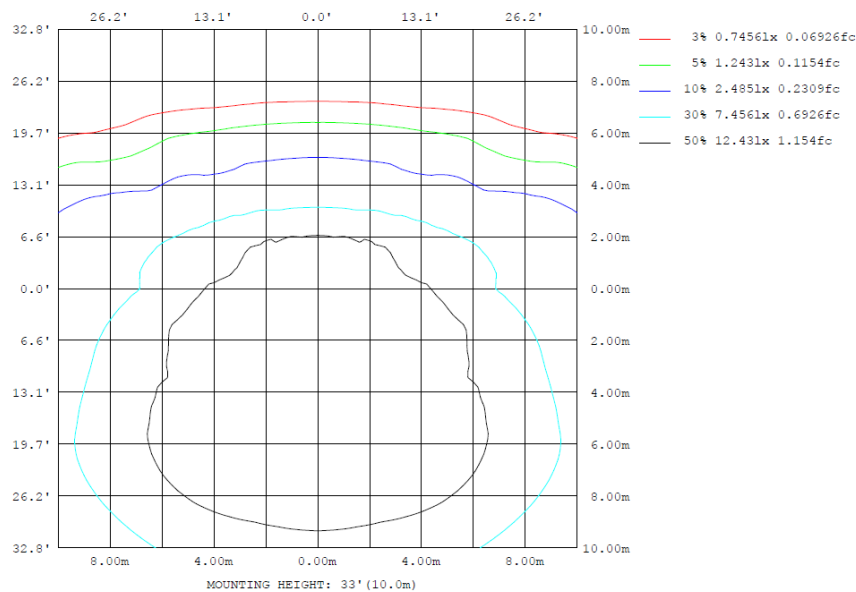
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

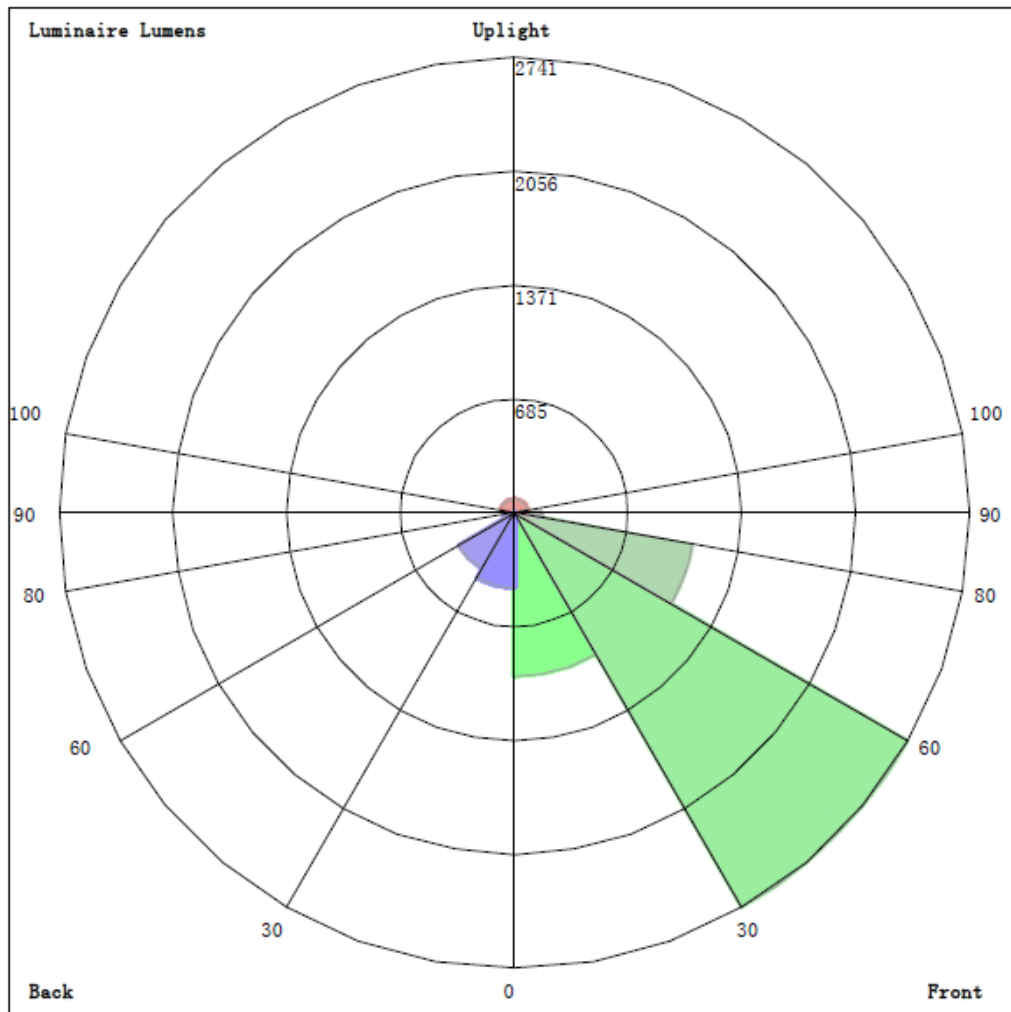
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	1820	2157	2256	2157	1820	1487	1416	1487	0- 10	173.0	173.0	2.87, 2.87
20	1690	2322	2762	2322	1690	1107	546.1	1107	10- 20	488.5	661.5	11, 11
30	1461	2783	3441	2783	1461	432.1	275.4	432.1	20- 30	771.7	1433	23.8, 23.8
40	1179	3056	3556	3056	1179	254.6	87.10	254.6	30- 40	1030	2463	40.8, 40.8
50	918.8	2657	2766	2657	918.8	105.4	49.12	105.4	40- 50	1114	3577	59.3, 59.3
60	624.1	1969	2107	1969	624.1	45.99	14.99	45.99	50- 60	982.4	4559	75.6, 75.6
70	384.8	1257	1286	1257	384.8	5.726	0.9548	5.726	60- 70	745.3	5305	87.9, 87.9
80	203.6	545.3	603.6	545.3	203.6	2.430	1.326	2.430	70- 80	407.9	5713	94.7, 94.7
90	19.32	173.3	297.0	173.3	19.32	1.624	1.425	1.624	80- 90	167.6	5880	97.5, 97.5
100	16.67	74.01	295.6	74.01	16.67	2.051	1.835	2.051	90-100	69.78	5950	98.6, 98.6
110	14.44	16.77	45.91	16.77	14.44	1.654	2.062	1.654	100-110	32.80	5983	99.2, 99.2
120	8.123	47.46	19.20	47.46	8.123	1.602	2.026	1.602	110-120	14.42	5997	99.4, 99.4
130	4.576	39.79	46.01	39.79	4.576	1.685	2.363	1.685	120-130	15.83	6013	99.7, 99.7
140	1.442	24.70	38.02	24.70	1.442	1.848	2.415	1.848	130-140	11.28	6024	99.9, 99.9
150	0.9474	12.27	20.50	12.27	0.9474	2.083	2.423	2.083	140-150	5.765	6030	100, 100
160	1.150	0.9556	8.239	0.9556	1.150	2.171	2.158	2.171	150-160	2.068	6032	100, 100
170	1.327	1.217	1.464	1.217	1.327	1.689	1.648	1.689	160-170	0.5462	6033	100, 100
180	1.617	1.561	1.334	1.561	1.617	1.482	1.414	1.482	170-180	0.1430	6033	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	173.03	0-10	173.03	2.87%
10-20	488.48	0-20	661.51	10.97%
20-30	771.72	0-30	1433.23	23.76%
30-40	1029.56	0-40	2462.79	40.82%
40-50	1114.28	0-50	3577.07	59.29%
50-60	982.42	0-60	4559.49	75.58%
60-70	745.32	0-70	5304.81	87.93%
70-80	407.91	0-80	5712.72	94.69%
80-90	167.64	0-90	5880.36	97.47%
90-100	69.78	0-100	5950.14	98.63%
100-110	32.80	0-110	5982.94	99.17%
110-120	14.42	0-120	5997.36	99.41%
120-130	15.83	0-130	6013.19	99.67%
130-140	11.28	0-140	6024.47	99.86%
140-150	5.76	0-150	6030.23	99.96%
150-160	2.07	0-160	6032.30	99.99%
160-170	0.55	0-170	6032.85	100.00%
170-180	0.14	0-180	6032.99	100.00%

4.2 Goniophotometer Test

LCS/BUG

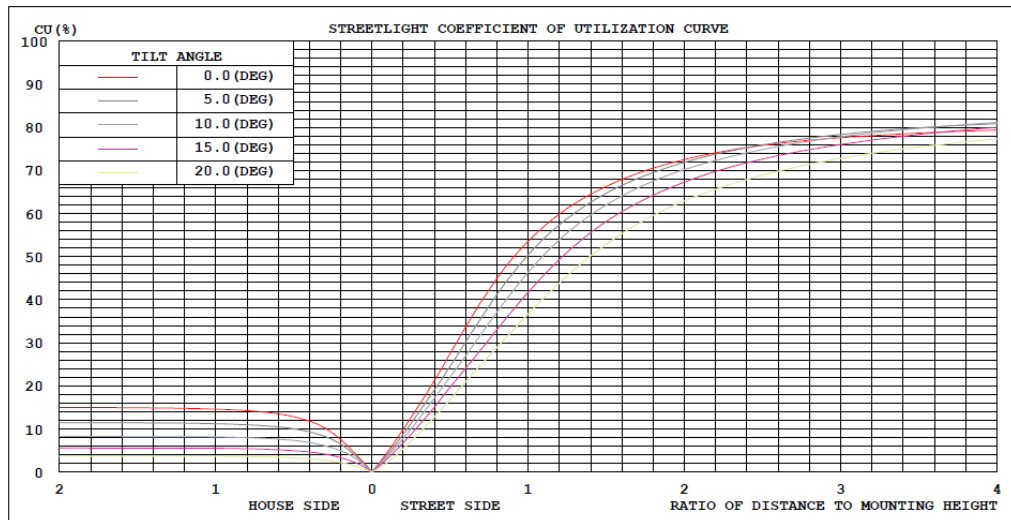


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

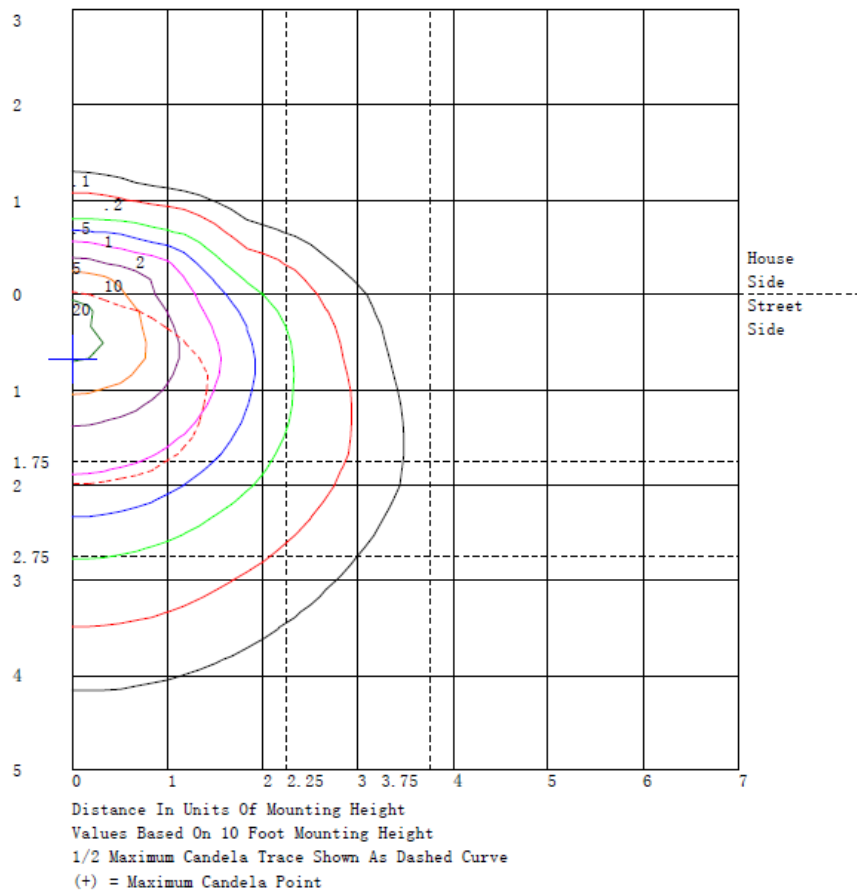
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	981.9	N.A.	16.3
FM - Front-Medium (30-60)	2741.4	N.A.	45.4
FH - Front-High (60-80)	1089.1	N.A.	18.1
FVH - Front-Very High (80-90)	160.6	N.A.	2.7
BL - Back-Low (0-30)	451.3	N.A.	7.5
BM - Back-Medium (30-60)	384.8	N.A.	6.4
BH - Back-High (60-80)	64.1	N.A.	1.1
BVH - Back-Very High (80-90)	7.0	N.A.	0.1
UL - Uplight-Low (90-100)	69.8	N.A.	1.2
UH - Uplight-High (100-180)	82.9	N.A.	1.4
Total	6032.9	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

Table--1 UNIT: cd

C (DEG) γ	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	1900	1901	1903	1905	1907	1909	1911	1913	1916	1918	1919	1920	1921	1923	1926	1928	1928	1928	1928
5	1911	1904	1900	1898	1902	1906	1907	1888	1870	1860	1881	1911	1944	1967	1985	1995	1989	1978	1967
10	1820	1860	1892	1917	1921	1927	1945	2006	2080	2157	2230	2291	2334	2328	2307	2280	2266	2258	2256
15	1768	1763	1785	1835	1937	2047	2147	2180	2194	2202	2236	2270	2299	2311	2315	2312	2302	2289	2278
20	1690	1730	1788	1862	1971	2084	2189	2248	2291	2322	2340	2363	2400	2498	2604	2700	2742	2762	2762
25	1567	1681	1786	1893	1969	2050	2129	2202	2286	2388	2549	2723	2896	3046	3171	3261	3270	3252	3225
30	1461	1654	1815	1944	2006	2062	2141	2345	2569	2783	2898	2991	3077	3219	3353	3460	3478	3467	3441
35	1303	1529	1726	1894	2003	2105	2222	2428	2655	2885	3091	3273	3420	3497	3539	3558	3577	3585	3585
40	1179	1413	1626	1819	1967	2113	2276	2539	2809	3056	3195	3296	3371	3458	3528	3577	3583	3573	3556
45	1073	1257	1452	1659	1887	2120	2349	2573	2773	2938	3023	3070	3092	3114	3122	3119	3099	3075	3053
50	919	1058	1235	1450	1745	2045	2319	2477	2586	2657	2700	2725	2740	2773	2802	2820	2806	2785	2766
55	784	919	1085	1281	1541	1806	2048	2201	2311	2381	2410	2412	2395	2368	2336	2308	2307	2312	2317
60	624	808	990	1169	1358	1536	1695	1812	1903	1969	1997	2013	2028	2081	2134	2173	2158	2132	2107
65	525	696	853	998	1127	1245	1353	1462	1556	1629	1655	1663	1663	1681	1700	1717	1731	1741	1745
70	385	478	579	688	816	943	1059	1145	1211	1257	1270	1271	1266	1281	1296	1307	1302	1294	1286
75	283	323	378	447	547	648	739	810	825	834	839	843	858	873	886	888	886	886	883
80	204	205	221	251	305	367	430	477	516	545	558	563	565	571	576	582	591	599	604
85	80.1	79.5	89.2	109	145	188	232	268	301	330	348	362	375	391	405	417	421	422	421
90	19.3	29.8	42.2	56.5	73.2	91.5	111	131	152	173	196	217	237	255	270	282	290	295	297
95	16.0	22.2	28.8	35.8	42.9	50.7	59.4	69.5	81.0	94.1	110	127	145	164	181	196	206	212	214
100	16.7	17.7	19.1	21.0	21.8	24.3	29.5	39.9	54.5	74.0	101	132	165	199	232	260	279	291	296
105	11.0	12.1	13.1	14.1	14.4	15.1	16.7	20.5	25.7	32.4	42.2	52.4	61.7	65.8	69.4	73.7	85.0	96.3	106
110	14.4	10.6	9.70	11.7	19.8	28.3	34.8	29.2	22.2	16.8	23.5	32.6	41.5	43.5	43.9	43.4	44.5	45.4	45.9
115	11.5	7.64	6.80	8.96	16.5	25.2	33.4	37.1	38.2	36.6	28.4	19.8	13.5	18.2	25.7	34.0	38.8	42.0	43.1
120	8.12	4.90	4.56	7.11	14.3	23.1	32.1	38.6	43.8	47.5	49.7	49.8	47.5	39.2	29.8	21.3	18.7	18.2	19.2
125	6.22	3.40	3.22	5.68	12.2	20.3	28.9	35.8	41.9	46.9	50.5	52.7	53.7	52.6	50.8	48.5	46.5	45.0	44.1
130	4.58	2.34	2.27	4.37	9.76	16.5	23.7	29.6	35.0	39.8	44.1	47.5	49.8	49.9	49.1	47.8	47.0	46.3	46.0
135	1.50	0.00	0.00	0.94	6.14	12.5	19.2	24.0	28.3	32.2	36.5	40.2	43.1	43.8	43.8	43.4	43.5	43.5	43.7
140	1.44	2.23	3.56	5.43	8.00	11.0	14.3	17.7	21.3	24.7	27.9	30.7	33.1	34.6	35.6	36.3	37.1	37.7	38.0
145	1.33	1.55	2.25	3.42	5.18	7.33	9.77	12.5	15.3	18.0	20.1	21.9	23.6	24.9	26.1	27.1	28.2	29.2	29.8
150	0.95	0.92	0.90	0.87	0.27	0.10	0.78	4.27	8.33	12.3	14.1	15.4	16.3	17.2	18.0	18.7	19.5	20.1	20.5
155	1.04	0.91	0.95	1.15	1.46	1.99	2.77	4.11	5.62	7.18	8.51	9.72	10.8	11.5	12.0	12.5	13.0	13.4	13.7
160	1.15	1.08	1.06	1.10	1.26	1.41	1.51	1.22	0.98	0.96	1.64	2.61	3.77	5.15	6.48	7.61	8.07	8.25	8.24
165	1.23	1.23	1.23	1.23	1.18	1.15	1.16	1.26	1.42	1.65	2.12	2.53	2.75	2.27	1.65	1.05	0.93	0.94	1.02
170	1.33	1.33	1.33	1.33	1.33	1.32	1.31	1.28	1.25	1.22	1.19	1.18	1.19	1.29	1.39	1.49	1.49	1.48	1.46
175	1.40	1.41	1.42	1.42	1.42	1.41	1.40	1.40	1.40	1.39	1.38	1.37	1.36	1.34	1.32	1.30	1.27	1.25	1.24
180	1.62	1.63	1.63	1.63	1.62	1.61	1.60	1.59	1.58	1.56	1.54	1.52	1.49	1.46	1.44	1.41	1.38	1.35	1.33

Table--2 UNIT: cd

C (DEG) γ	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	1928	1928	1928	1926	1923	1921	1920	1919	1918	1916	1913	1911	1909	1907	1905	1903	1901	1900	1911
5	1978	1989	1995	1985	1967	1944	1911	1881	1860	1870	1888	1907	1906	1902	1898	1900	1904	1911	1862
10	2258	2266	2280	2307	2328	2334	2291	2230	2157	2080	2006	1945	1927	1921	1917	1892	1860	1820	1754
15	2289	2302	2312	2315	2311	2299	2270	2236	2202	2194	2180	2147	2047	1937	1835	1785	1763	1768	1642
20	2762	2742	2700	2604	2498	2400	2363	2340	2322	2291	2248	2189	2084	1971	1862	1788	1730	1690	1530
25	3252	3270	3261	3171	3046	2896	2723	2549	2388	2286	2202	2129	2050	1969	1883	1786	1681	1567	1492
30	3467	3478	3460	3353	3219	3077	2991	2898	2783	2569	2345	2141	2062	2006	1944	1815	1654	1461	1440
35	3585	3577	3558	3539	3497	3420	3273	3091	2885	2655	2428	2222	2105	2003	1894	1726	1529	1303	1334
40	3573	3583	3577	3528	3458	3371	3296	3195	3056	2809	2539	2276	2113	1967	1819	1626	1413	1179	1164
45	3075	3099	3119	3122	3114	3092	3070	3023	2938	2773	2573	2349	2120	1887	1659	1452	1257	1073	1022
50	2785	2806	2820	2802	2773	2740	2725	2700	2657	2586	2477	2319	2045	1745	1450	1235	1058	919	818
55	2312	2307	2308	2336	2368	2395	2412	2410	2381	2311	2201	2048	1806	1541	1281	1085	919	784	635
60	2132	2158	2173	2134	2081	2028	2013	1997	1969	1903	1812	1695	1536	1358	1169	990	808	624	470
65	1741	1731	1717	1700	1681	1663	1663	1655	1629	1556	1462	1353	1245	1127	998	853	696	525	386
70	1294	1302	1307	1296	1281	1266	1271	1270	1257	1211	1145	1059	943	816	688	579	478	385	289
75	886	888	886	873	858	843	839	834	825	810	783	739	648	547	447	378	323	283	203
80	599	591	582	576	571	565	563	558	545	516	477	430	367	305	251	221	205	204	139
85	422	421	417	405	391	375	362	348	330	301	268	232	188	145	109	89.2	79.5	80.1	57.6
90	295	290	282	270	255	237	217	196	173	152	131	111	91.5	73.2	56.5	42.2	29.8	19.3	17.7
95	212	206	196	181	164	145	127	110	94.1	81.0	69.5	59.4	50.7	42.9	35.8	28.8	22.2	16.0	13.8
100	291	279	260	232	199	165	132	101	74.0	54.5	39.9	29.5	24.3	21.8	21.0	19.1	17.7	16.7	13.3
105	96.3	85.0	73.7	69.4	65.8	61.7	52.4	42.2	32.4	25.7	20.5	16.7	15.1	14.4	14.1	13.1	12.1	11.0	8.56
110	45.4	44.5	43.4	43.9	43.5	41.5	32.6	23.5	16.8	22.2	29.2	34.8	28.3	19.8	11.7	9.70	10.6	14.4	10.4
115	42.0	38.8	34.0	25.7	18.2	13.5	19.8	28.4	36.6	38.2	37.1	33.4	25.2	16.5	8.96	6.80	7.64	11.5	8.38
120	18.2	18.7	21.3	29.8	39.2	47.5	49.8	49.7	47.5	43.8	38.6	32.1	23.1	14.3	7.11	4.56	4.90	8.12	6.26
125	45.0	46.5	48.5	50.8	52.6	53.7	52.7	50.5	46.9	41.9	35.8	28.9	20.3	12.2	5.68	3.22	3.40	6.22	4.91
130	46.3	47.0	47.8	49.1	49.9	49.8	47.5	44.1	39.8	35.0	29.6	23.7	16.5	9.76	4.37	2.27	2.34	4.58	3.75
135	43.5	43.5	43.4	43.8	43.8	43.1	40.2	36.5	32.2	28.3	24.0	19.2	12.5	6.14	0.94	0.00	0.00	1.50	1.88

Table--3

UNIT: °C

γ (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	1920	1926	1929	1930	1930	1931	1931	1932	1932	1933	1933	1933	1932	1931	1930	1929	1928	1929	1930
5	1820	1786	1768	1751	1728	1670	1610	1560	1553	1558	1569	1570	1568	1560	1534	1507	1487	1507	1534
10	1692	1635	1576	1527	1489	1477	1477	1487	1511	1531	1535	1477	1411	1355	1366	1391	1416	1391	1366
15	1542	1468	1427	1406	1400	1409	1417	1412	1358	1291	1222	1171	1129	1099	1092	1093	1098	1093	1092
20	1412	1338	1341	1362	1374	1304	1211	1107	1015	925	839	753	677	614	576	554	546	554	576
25	1416	1340	1270	1193	1106	981	849	721	614	523	452	418	401	395	387	383	382	383	387
30	1387	1302	1171	1019	857	697	551	432	385	364	357	333	313	295	284	278	275	278	284
35	1307	1220	1029	813	603	489	406	348	301	265	239	213	191	175	164	158	156	158	164
40	1103	997	804	597	408	328	282	255	210	170	138	117	103	94.4	89.1	87.0	87.1	87.0	89.1
45	942	832	662	486	325	245	194	163	130	106	89.5	81.2	77.7	76.9	74.1	72.1	71.1	72.1	74.1
50	712	604	479	359	253	186	138	105	85.1	73.7	68.0	60.6	55.3	51.8	49.8	49.0	49.1	49.0	49.8
55	505	394	306	234	178	133	99.3	75.1	58.7	48.6	42.8	38.6	36.5	35.7	34.7	34.3	34.3	34.3	34.7
60	343	244	182	141	113	84.7	62.5	46.0	35.5	28.9	25.0	21.2	18.5	16.8	15.7	15.1	15.0	15.1	15.7
65	273	184	128	91.7	68.5	47.9	33.4	23.2	13.4	6.09	1.21	0.00	0.00	0.56	0.56	0.63	0.74	0.63	0.56
70	208	143	97.1	64.1	41.1	23.7	12.4	5.73	1.87	0.46	0.55	0.25	0.35	0.65	0.74	0.84	0.95	0.84	0.74
75	138	86.9	54.4	33.2	20.5	11.1	5.87	3.50	1.54	0.75	0.69	0.51	0.55	0.73	0.86	1.01	1.16	1.01	0.86
80	86.8	48.2	27.3	16.2	11.6	6.45	3.65	2.43	1.36	0.90	0.84	0.73	0.74	0.85	1.00	1.17	1.33	1.17	1.00
85	39.2	24.9	16.2	10.6	7.31	4.50	2.76	1.81	1.21	0.99	1.00	0.93	0.94	1.00	1.11	1.24	1.37	1.24	1.11
90	15.7	13.5	10.6	7.73	5.10	3.49	2.35	1.62	1.27	1.15	1.18	1.15	1.16	1.20	1.26	1.33	1.42	1.33	1.26
95	11.6	9.61	7.59	5.75	4.17	3.05	2.24	1.69	1.43	1.35	1.37	1.35	1.36	1.40	1.43	1.47	1.55	1.47	1.43
100	10.3	7.84	5.90	4.40	3.30	2.63	2.24	2.05	1.91	1.85	1.84	1.79	1.74	1.72	1.73	1.76	1.83	1.76	1.73
105	6.45	4.68	3.25	2.17	1.48	1.38	1.54	1.82	1.89	1.95	1.98	1.97	1.95	1.94	1.95	2.00	2.07	2.00	1.95
110	7.19	4.77	3.41	2.66	2.30	1.93	1.73	1.65	1.66	1.73	1.83	1.92	1.99	2.06	2.06	2.06	2.06	2.06	2.06
115	5.88	4.00	2.90	2.27	1.97	1.73	1.64	1.64	1.67	1.74	1.81	1.84	1.86	1.87	1.90	1.93	1.96	1.93	1.90
120	4.71	3.48	2.63	2.05	1.70	1.55	1.53	1.60	1.66	1.74	1.82	1.87	1.90	1.93	1.97	2.00	2.03	2.00	1.97
125	3.82	2.94	2.32	1.89	1.63	1.54	1.55	1.63	1.72	1.82	1.92	1.97	2.00	2.04	2.09	2.14	2.17	2.14	2.09
130	3.05	2.48	2.05	1.74	1.56	1.53	1.58	1.69	1.77	1.86	1.95	2.03	2.11	2.18	2.26	2.32	2.36	2.32	2.26
135	2.12	2.20	2.03	1.79	1.56	1.57	1.64	1.75	1.85	1.94	2.03	2.11	2.18	2.24	2.29	2.34	2.37	2.34	2.29
140	1.86	1.94	1.88	1.77	1.67	1.70	1.76	1.85	1.91	1.98	2.05	2.12	2.19	2.26	2.32	2.37	2.41	2.37	2.32
145	1.71	1.82	1.85	1.85	1.84	1.87	1.91	1.97	2.04	2.11	2.17	2.21	2.24	2.27	2.34	2.40	2.45	2.40	2.34
150	1.64	1.85	1.94	1.97	1.97	2.01	2.05	2.08	2.12	2.16	2.19	2.22	2.25	2.28	2.33	2.38	2.42	2.38	2.33
155	1.84	2.09	2.18	2.20	2.18	2.16	2.13	2.10	2.11	2.14	2.17	2.20	2.24	2.27	2.28	2.28	2.28	2.28	2.28
160	2.02	2.28	2.36	2.36	2.31	2.26	2.22	2.17	2.17	2.18	2.19	2.17	2.14	2.12	2.13	2.14	2.16	2.14	2.13
165	2.08	2.31	2.37	2.34	2.27	2.22	2.17	2.11	2.07	2.03	1.99	1.94	1.90	1.87	1.89	1.91	1.93	1.91	1.89
170	1.98	2.15	2.16	2.10	2.00	1.89	1.78	1.69	1.67	1.68	1.69	1.68	1.66	1.65	1.64	1.64	1.65	1.64	1.64
175	1.82	1.93	1.96	1.94	1.88	1.78	1.68	1.59	1.58	1.58	1.58	1.53	1.48	1.45	1.47	1.51	1.55	1.51	1.47
180	1.60	1.59	1.59	1.58	1.57	1.54	1.51	1.48	1.45	1.41	1.38	1.36	1.35	1.35	1.37	1.39	1.41	1.39	1.37

C (DEG)																UNIT: °C			
γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	1931	1932	1933	1933	1933	1932	1932	1931	1931	1930	1930	1929	1926	1920	1911				
5	1560	1568	1570	1569	1558	1553	1560	1610	1670	1728	1751	1768	1786	1820	1862				
10	1355	1411	1477	1535	1531	1511	1487	1477	1477	1489	1527	1576	1635	1692	1754				
15	1099	1129	1171	1222	1291	1358	1412	1417	1409	1400	1406	1427	1468	1542	1642				
20	614	677	753	839	925	1015	1107	1211	1304	1374	1362	1341	1338	1412	1530				
25	395	401	418	452	523	614	721	849	981	1106	1193	1270	1340	1416	1492				
30	295	313	333	357	364	385	432	551	697	857	1019	1171	1302	1387	1440				
35	175	191	213	239	265	301	348	406	489	603	813	1029	1220	1307	1334				
40	94.4	103	117	138	170	210	255	282	328	408	597	804	997	1103	1164				
45	76.9	77.7	81.2	89.5	106	130	163	194	245	325	486	662	832	942	1022				
50	51.8	55.3	60.6	68.0	73.7	85.1	105	138	186	253	359	479	604	712	818				
55	35.7	36.5	38.6	42.8	48.6	58.7	75.1	99.3	133	178	234	306	394	505	635				
60	16.8	18.5	21.2	25.0	28.9	35.5	46.0	62.5	84.7	113	141	182	244	343	470				
65	0.56	0.00	0.00	1.21	6.09	13.4	23.2	33.4	47.9	68.5	91.7	128	184	273	386				
70	0.65	0.35	0.25	0.55	0.46	1.87	5.73	12.4	23.7	41.1	64.1	97.1	143	208	289				
75	0.73	0.55	0.51	0.69	0.75	1.54	3.50	5.87	11.1	20.5	33.2	54.4	86.9	138	203				
80	0.85	0.74	0.73	0.84	0.90	1.36	2.43	3.65	6.45	11.6	16.2	27.3	48.2	86.8	139				
85	1.00	0.94	0.93	1.00	0.99	1.21	1.81	2.76	4.50	7.31	10.6	16.2	24.9	39.2	57.6				
90	1.20	1.16	1.15	1.18	1.15	1.27	1.62	2.35	3.49	5.10	7.73	10.6	13.5	15.7	17.7				
95	1.40	1.36	1.35	1.37	1.35	1.43	1.69	2.24	3.05	4.17	5.75	7.59	9.61	11.6	13.8				
100	1.72	1.74	1.79	1.84	1.85	1.91	2.05	2.24	2.63	3.30	4.40	5.90	7.84	10.3	13.3				
105	1.94	1.95	1.97	1.98	1.95	1.89	1.82	1.54	1.38	1.48	2.17	3.25	4.68	6.45	8.56				
110	2.06	1.99	1.92	1.83	1.73	1.66	1.65	1.73	1.93	2.30	2.66	3.41	4.77	7.19	10.4				
115	1.87	1.86	1.84	1.81	1.74	1.67	1.64	1.64	1.73	1.97	2.27	2.90	4.00	5.88	8.38				
120	1.93	1.90	1.87	1.82	1.74	1.66	1.60	1.53	1.55	1.70	2.05	2.63	3.48	4.71	6.26				
125	2.04	2.00	1.97	1.92	1.82	1.72	1.63	1.55	1.54	1.63	1.89	2.32	2.94	3.82	4.91				
130	2.18	2.11	2.03	1.95	1.86	1.77	1.69	1.58	1.53	1.56	1.74	2.05	2.48	3.05	3.75				
135	2.24	2.18	2.11	2.03	1.94	1.85	1.75	1.64	1.57	1.56	1.79	2.03	2.20	2.12	1.88				
140	2.26	2.19	2.12	2.05	1.98	1.91	1.85	1.76	1.70	1.67	1.77	1.88	1.94	1.86	1.70				
145	2.27	2.24	2.21	2.17	2.11	2.04	1.97	1.91	1.87	1.84	1.85	1.85	1.82	1.71	1.55				
150	2.28	2.25	2.22	2.19	2.16	2.12	2.08	2.05	2.01	1.97	1.97	1.94	1.85	1.64	1.34				
155	2.27	2.24	2.20	2.17	2.14	2.11	2.10	2.13	2.16	2.18	2.20	2.18	2.09	1.84	1.50				
160	2.12	2.14	2.17	2.19	2.18	2.17	2.17	2.22	2.26	2.31	2.36	2.36	2.28	2.02	1.65				
165	1.87	1.90	1.94	1.99	2.03	2.07	2.11	2.17	2.22	2.27	2.34	2.37	2.31	2.08	1.72				
170	1.65	1.66	1.68	1.69	1.68	1.67	1.69	1.78	1.89	2.00	2.10	2.16	2.15	1.98	1.71				
175	1.45	1.48	1.53	1.58	1.58	1.58	1.59	1.68	1.78	1.88	1.94	1.96	1.93	1.82	1.64				
180	1.35	1.35	1.36	1.38	1.41	1.45	1.48	1.51	1.54	1.57	1.58	1.59	1.59	1.50	1.41				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	WPX2 @ 40W / 3000K 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	42.5	0.787	16.03

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*****