

## 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.**

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Issue Date: 2023-10-26

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		10042
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		156.4
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		9773
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	152.2
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		64.2
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	5.11
			277V	12.15
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.993
			277V	0.870
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4114
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		85.8
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		20
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		85
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%		-11%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		2.2%
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		0.539
(Goniophotometer – Section 4.2)		Non-Worst Case		0.263
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		64.2
(Goniophotometer – Section 4.2)		Non-Worst Case		63.4

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-10-20	WPX3 @ 65W / 4000K	231020001-S1
2	Goniophotometer Test	2023-10-20	WPX3 @ 65W / 4000K	231020001-S1
3	THD and PF Test	2023-10-20	WPX3 @ 65W / 4000K	231020001-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. WPX3 @ 65W / 4000K, color tunable from 3000K, 4000K and 5000K.

Electrical Specification: 120-277Vac, 50/60Hz

Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

<b>Model No.</b>	WPX3 @ 65W / 4000K	<b>Sample ID</b>	231020001-S1
<b>Operate time (Min.)</b>	10	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

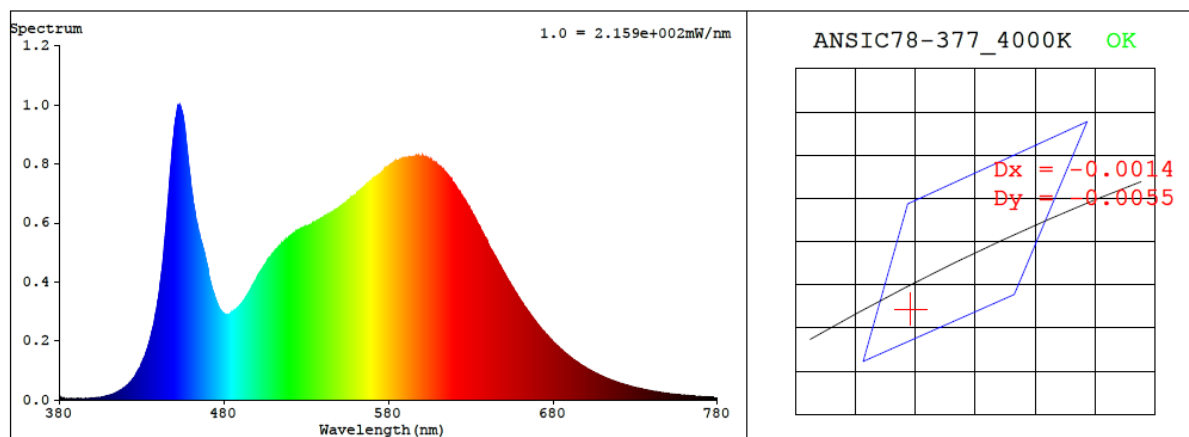
<b>Test Method</b>
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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 4<math>\pi</math> 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	0.539	64.2	0.993
277.0	60	0.263	63.4	0.870

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4114	85.8	20	-0.0022	85	96	-11%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3742$   $y = 0.3682$  /  $u' = 0.2244$   $v' = 0.4968$  ( $duv = -2.20e-03$ )

CCT= 4114K Prcp WL: Ld=580.0nm Purity=22.8%

Peak WL: Lp=453nm FWHM: =24.4nm Ratio:R=18.6% G=77.3% B=4.1%

Render Index: Ra = 85.8 AvgR = 80.3 TM30:Rf=85 Rg=96

EEL: 0.08572 A++ Highest

R1 =85	R2 =93	R3 =96	R4 =84	R5 =85	R6 =89	R7 =86
R8 =68	R9 =20	R10=82	R11=83	R12=66	R13=88	R14=98 R15=80

## 4.1 Integrating Sphere Test

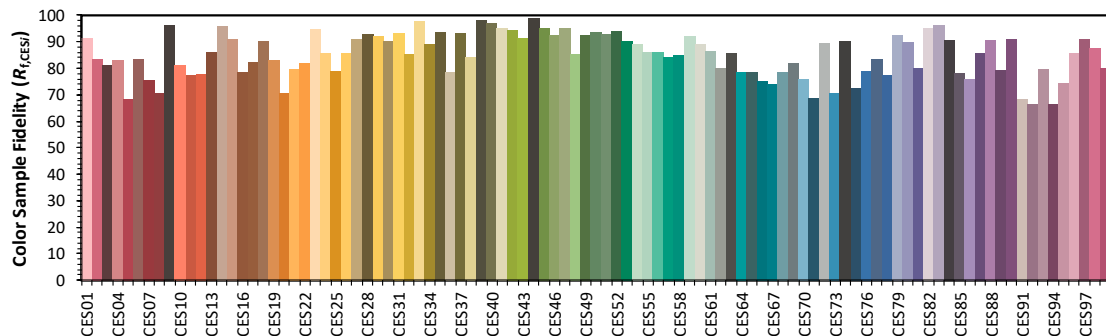
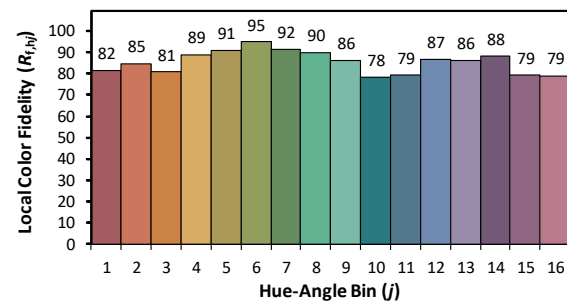
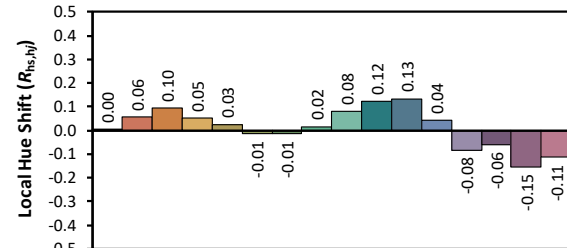
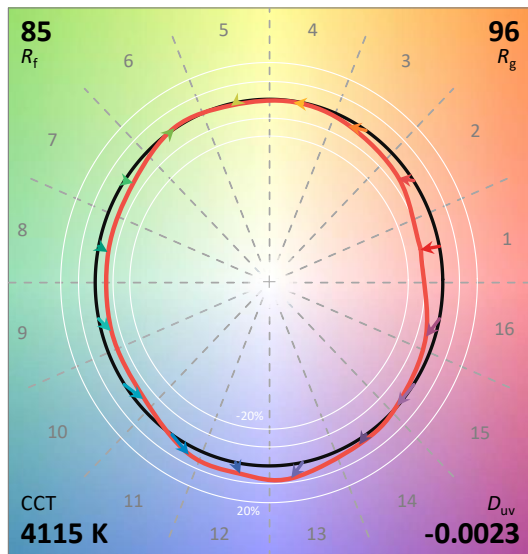
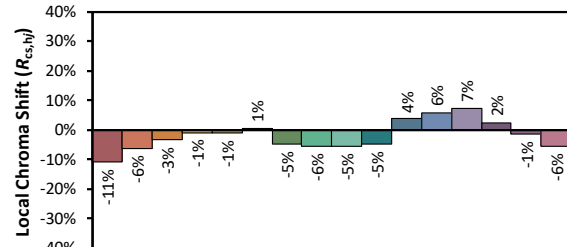
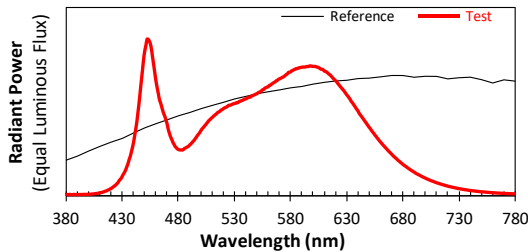
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/10/26

Model: WPX3 @ 65W / 4000K



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

$x$  0.3741  
 $y$  0.3680  
 $u'$  0.2244  
 $v'$  0.4967

CIE 13.3-1995  
(CRI)

$R_a$  86  
 $R_g$  21

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

## 4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	5.70E-06	447	7.39E-04	514	5.22E-04	581	7.97E-04	648	4.54E-04	715	6.83E-05
381	3.80E-06	448	8.06E-04	515	5.30E-04	582	7.99E-04	649	4.43E-04	716	6.65E-05
382	4.20E-06	449	8.75E-04	516	5.33E-04	583	8.04E-04	650	4.34E-04	717	6.42E-05
383	4.90E-06	450	9.25E-04	517	5.38E-04	584	8.06E-04	651	4.25E-04	718	6.17E-05
384	4.70E-06	451	9.60E-04	518	5.46E-04	585	8.11E-04	652	4.14E-04	719	6.05E-05
385	3.60E-06	452	9.98E-04	519	5.47E-04	586	8.10E-04	653	4.04E-04	720	5.80E-05
386	4.30E-06	453	9.98E-04	520	5.54E-04	587	8.15E-04	654	3.96E-04	721	5.60E-05
387	5.40E-06	454	9.86E-04	521	5.58E-04	588	8.16E-04	655	3.85E-04	722	5.47E-05
388	3.80E-06	455	9.67E-04	522	5.62E-04	589	8.18E-04	656	3.77E-04	723	5.29E-05
389	4.10E-06	456	9.30E-04	523	5.65E-04	590	8.19E-04	657	3.67E-04	724	5.13E-05
390	3.70E-06	457	8.78E-04	524	5.71E-04	591	8.20E-04	658	3.59E-04	725	4.98E-05
391	4.70E-06	458	8.30E-04	525	5.76E-04	592	8.20E-04	659	3.49E-04	726	4.81E-05
392	4.50E-06	459	7.77E-04	526	5.76E-04	593	8.21E-04	660	3.41E-04	727	4.66E-05
393	4.70E-06	460	7.28E-04	527	5.79E-04	594	8.23E-04	661	3.32E-04	728	4.50E-05
394	4.50E-06	461	6.88E-04	528	5.82E-04	595	8.24E-04	662	3.24E-04	729	4.34E-05
395	5.00E-06	462	6.51E-04	529	5.85E-04	596	8.23E-04	663	3.15E-04	730	4.24E-05
396	5.50E-06	463	6.13E-04	530	5.88E-04	597	8.28E-04	664	3.08E-04	731	4.09E-05
397	5.50E-06	464	5.92E-04	531	5.88E-04	598	8.27E-04	665	3.00E-04	732	3.95E-05
398	4.80E-06	465	5.67E-04	532	5.93E-04	599	8.25E-04	666	2.92E-04	733	3.82E-05
399	6.10E-06	466	5.41E-04	533	5.92E-04	600	8.25E-04	667	2.84E-04	734	3.73E-05
400	6.80E-06	467	5.19E-04	534	5.99E-04	601	8.24E-04	668	2.77E-04	735	3.59E-05
401	6.80E-06	468	5.01E-04	535	6.02E-04	602	8.24E-04	669	2.69E-04	736	3.47E-05
402	6.80E-06	469	4.78E-04	536	6.05E-04	603	8.20E-04	670	2.62E-04	737	3.41E-05
403	8.10E-06	470	4.52E-04	537	6.08E-04	604	8.19E-04	671	2.54E-04	738	3.25E-05
404	8.20E-06	471	4.18E-04	538	6.10E-04	605	8.16E-04	672	2.47E-04	739	3.14E-05
405	9.10E-06	472	3.95E-04	539	6.15E-04	606	8.11E-04	673	2.41E-04	740	3.05E-05
406	1.06E-05	473	3.73E-04	540	6.17E-04	607	8.07E-04	674	2.35E-04	741	2.96E-05
407	1.12E-05	474	3.58E-04	541	6.21E-04	608	8.06E-04	675	2.28E-04	742	2.84E-05
408	1.25E-05	475	3.39E-04	542	6.24E-04	609	8.02E-04	676	2.21E-04	743	2.80E-05
409	1.40E-05	476	3.26E-04	543	6.28E-04	610	7.94E-04	677	2.16E-04	744	2.69E-05
410	1.49E-05	477	3.12E-04	544	6.28E-04	611	7.92E-04	678	2.09E-04	745	2.60E-05
411	1.72E-05	478	3.04E-04	545	6.35E-04	612	7.88E-04	679	2.04E-04	746	2.50E-05
412	1.85E-05	479	2.97E-04	546	6.37E-04	613	7.82E-04	680	1.97E-04	747	2.43E-05
413	2.08E-05	480	2.92E-04	547	6.40E-04	614	7.75E-04	681	1.92E-04	748	2.33E-05
414	2.40E-05	481	2.90E-04	548	6.44E-04	615	7.70E-04	682	1.87E-04	749	2.29E-05
415	2.62E-05	482	2.90E-04	549	6.47E-04	616	7.63E-04	683	1.82E-04	750	2.19E-05
416	2.87E-05	483	2.90E-04	550	6.50E-04	617	7.55E-04	684	1.76E-04	751	2.14E-05
417	3.27E-05	484	2.90E-04	551	6.56E-04	618	7.47E-04	685	1.72E-04	752	2.10E-05
418	3.52E-05	485	2.97E-04	552	6.59E-04	619	7.39E-04	686	1.66E-04	753	2.04E-05
419	4.02E-05	486	3.02E-04	553	6.62E-04	620	7.32E-04	687	1.62E-04	754	1.95E-05
420	4.32E-05	487	3.05E-04	554	6.69E-04	621	7.25E-04	688	1.57E-04	755	1.88E-05
421	4.87E-05	488	3.10E-04	555	6.75E-04	622	7.15E-04	689	1.52E-04	756	1.83E-05
422	5.40E-05	489	3.14E-04	556	6.77E-04	623	7.06E-04	690	1.48E-04	757	1.78E-05
423	5.93E-05	490	3.22E-04	557	6.85E-04	624	6.96E-04	691	1.43E-04	758	1.71E-05
424	6.55E-05	491	3.28E-04	558	6.88E-04	625	6.89E-04	692	1.38E-04	759	1.65E-05
425	7.27E-05	492	3.36E-04	559	6.92E-04	626	6.80E-04	693	1.35E-04	760	1.63E-05
426	8.04E-05	493	3.45E-04	560	6.94E-04	627	6.72E-04	694	1.31E-04	761	1.54E-05
427	9.16E-05	494	3.52E-04	561	7.03E-04	628	6.62E-04	695	1.27E-04	762	1.50E-05
428	1.01E-04	495	3.63E-04	562	7.05E-04	629	6.52E-04	696	1.23E-04	763	1.42E-05
429	1.09E-04	496	3.72E-04	563	7.11E-04	630	6.42E-04	697	1.19E-04	764	1.43E-05
430	1.23E-04	497	3.84E-04	564	7.16E-04	631	6.33E-04	698	1.16E-04	765	1.38E-05
431	1.36E-04	498	3.92E-04	565	7.21E-04	632	6.23E-04	699	1.13E-04	766	1.32E-05
432	1.48E-04	499	4.02E-04	566	7.24E-04	633	6.13E-04	700	1.09E-04	767	1.28E-05
433	1.63E-04	500	4.14E-04	567	7.32E-04	634	6.00E-04	701	1.06E-04	768	1.26E-05
434	1.83E-04	501	4.25E-04	568	7.35E-04	635	5.91E-04	702	1.03E-04	769	1.20E-05
435	2.02E-04	502	4.32E-04	569	7.41E-04	636	5.80E-04	703	9.94E-05	770	1.16E-05
436	2.27E-04	503	4.41E-04	570	7.45E-04	637	5.70E-04	704	9.64E-05	771	1.12E-05
437	2.48E-04	504	4.50E-04	571	7.48E-04	638	5.59E-04	705	9.34E-05	772	1.11E-05
438	2.76E-04	505	4.58E-04	572	7.52E-04	639	5.49E-04	706	9.06E-05	773	1.05E-05
439	3.06E-04	506	4.68E-04	573	7.56E-04	640	5.38E-04	707	8.85E-05	774	1.05E-05
440	3.40E-04	507	4.77E-04	574	7.59E-04	641	5.24E-04	708	8.51E-05	775	1.02E-05
441	3.83E-04	508	4.84E-04	575	7.66E-04	642	5.14E-04	709	8.24E-05	776	9.70E-06
442	4.27E-04	509	4.91E-04	576	7.72E-04	643	5.05E-04	710	8.01E-05	777	9.60E-06
443	4.76E-04	510	4.97E-04	577	7.77E-04	644	4.94E-04	711	7.73E-05	778	9.10E-06
444	5.37E-04	511	5.05E-04	578	7.86E-04	645	4.85E-04	712	7.55E-05	779	9.10E-06
445	6.00E-04	512	5.10E-04	579	7.87E-04	646	4.74E-04	713	7.29E-05	780	9.10E-06
446	6.70E-04	513	5.17E-04	580	7.90E-04	647	4.64E-04	714	7.05E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	WPX3 @ 65W / 4000K	<b>Sample ID</b>	231020001-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	24.8	<b>Humidity (%RH)</b>	42.9

<b>Test Method</b>
<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 <math>25 \pm 1^{\circ}\text{C}</math>, 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 <math>\pm 0.2</math> 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 <math>1.0^{\circ}</math> vertical intervals and <math>15^{\circ}</math> horizontal intervals.</p>

#### Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
<b>WORST CASE</b>	120.0	60	0.539	64.2	0.993
<b>NON-WORST CASE</b>	277.0	60	0.263	63.4	0.870

#### Test Result

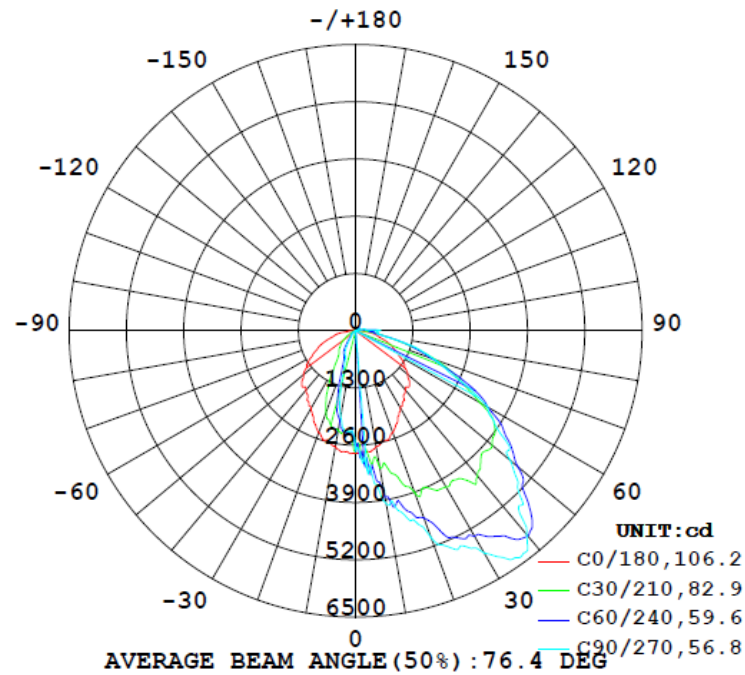
Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement (80°-90°)	BUG
		C0-180	C90-270	C0-180	C90-270			
<b>0°-180° zones</b>	10042	105.7	147.5	56.2	100.5	156.4	2.1%	B2-U3-G2
<b>0°-90° zones</b>	9773	105.7	147.5	56.2	100.5	152.2	2.2%	B2-U3-G2



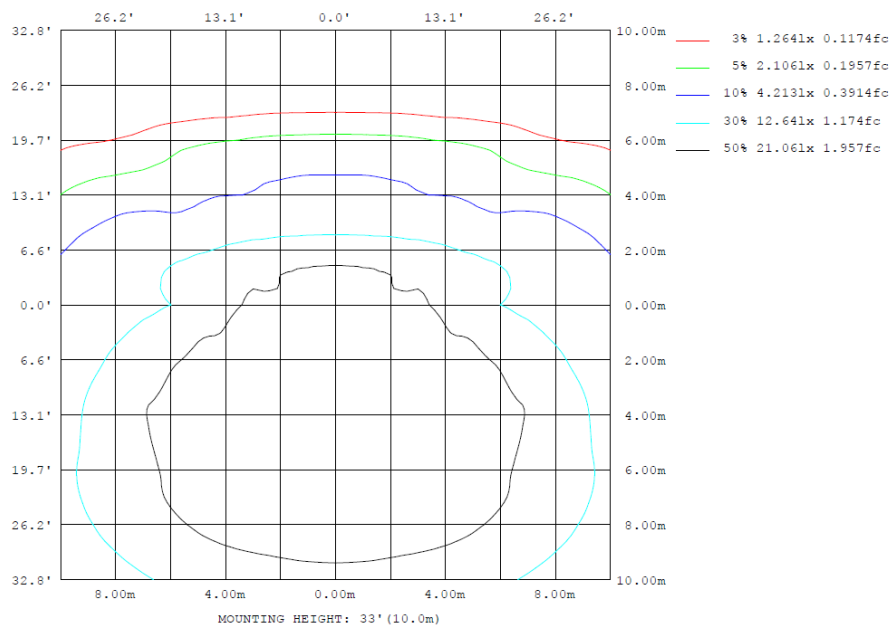
## 4.2 Goniophotometer Test

### Lighting Distribution Curve

#### LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

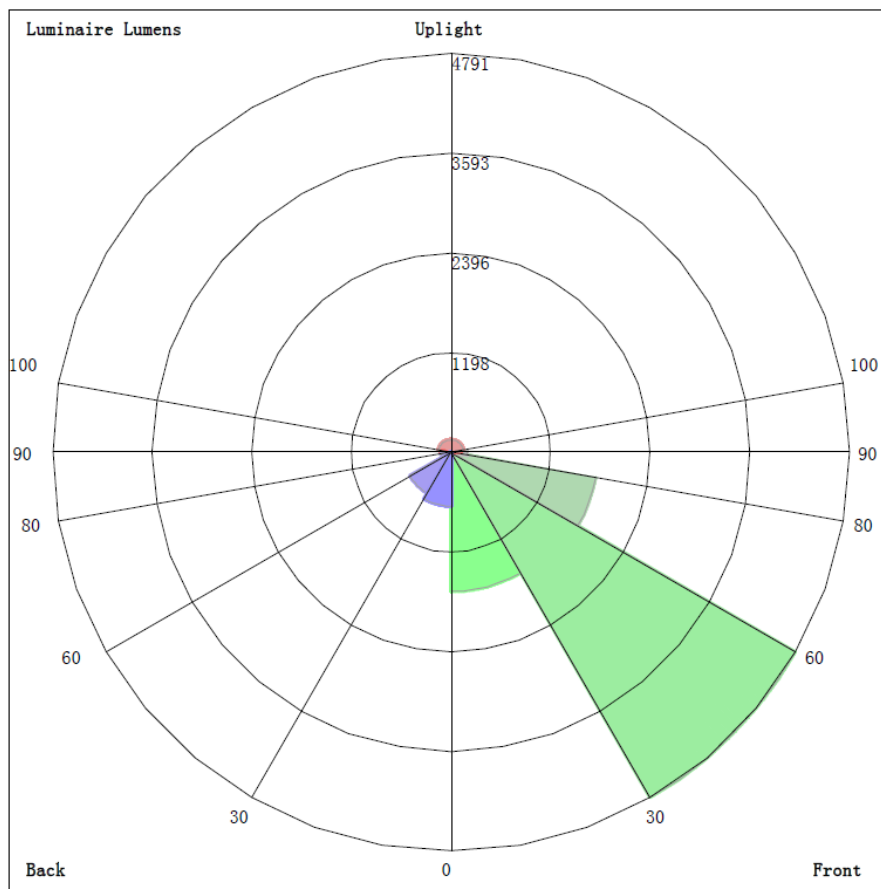
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	2670	3470	3980	3470	2670	2258	1976	2258	0- 10	256.7	256.7	2.56,2.56
20	2461	4275	4982	4275	2461	1341	700.2	1341	10- 20	785.8	1042	10.4,10.4
30	2034	5034	5823	5034	2034	621.6	424.9	621.6	20- 30	1276	2318	23.1,23.1
40	1744	5060	6033	5060	1744	392.9	139.4	392.9	30- 40	1730	4048	40.3,40.3
50	1547	4862	4583	4862	1547	174.1	67.21	174.1	40- 50	1910	5959	59.3,59.3
60	1141	3558	3453	3558	1141	89.26	25.84	89.26	50- 60	1715	7674	76.4,76.4
70	775.6	1937	1892	1937	775.6	12.14	1.246	12.14	60- 70	1252	8926	88.9,88.9
80	439.0	652.5	609.8	652.5	439.0	5.625	1.924	5.625	70- 80	631.7	9558	95.2,95.2
90	38.92	207.0	525.7	207.0	38.92	3.814	2.609	3.814	80- 90	215.9	9773	97.3,97.3
100	35.58	164.2	225.6	164.2	35.58	3.952	3.644	3.952	90-100	117.2	9891	98.5,98.5
110	16.87	58.38	76.84	58.38	16.87	3.129	4.225	3.129	100-110	46.44	9937	99,99
120	16.20	100.7	61.91	100.7	16.20	2.912	3.456	2.912	110-120	31.11	9968	99.3,99.3
130	8.467	81.81	102.4	81.81	8.467	2.939	3.938	2.939	120-130	33.10	10001	99.6,99.6
140	1.527	47.80	96.38	47.80	1.527	3.182	4.172	3.182	130-140	24.56	10026	99.8,99.8
150	1.602	20.05	43.90	20.05	1.602	3.463	3.994	3.463	140-150	11.82	10038	100,100
160	1.907	1.601	12.95	1.601	1.907	3.525	3.444	3.525	150-160	3.545	10041	100,100
170	2.237	2.147	2.174	2.147	2.237	2.843	2.480	2.843	160-170	0.8889	10042	100,100
180	2.609	2.496	2.173	2.496	2.609	2.430	2.265	2.430	170-180	0.2364	10042	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	256.66	0-10	256.66	2.56%
10-20	785.81	0-20	1042.47	10.38%
20-30	1275.98	0-30	2318.45	23.09%
30-40	1729.80	0-40	4048.25	40.31%
40-50	1910.33	0-50	5958.58	59.34%
50-60	1715.29	0-60	7673.87	76.42%
60-70	1252.01	0-70	8925.88	88.88%
70-80	631.65	0-80	9557.53	95.17%
80-90	215.87	0-90	9773.40	97.32%
90-100	117.20	0-100	9890.60	98.49%
100-110	46.44	0-110	9937.04	98.95%
110-120	31.11	0-120	9968.15	99.26%
120-130	33.10	0-130	10001.25	99.59%
130-140	24.56	0-140	10025.81	99.84%
140-150	11.82	0-150	10037.63	99.96%
150-160	3.54	0-160	10041.17	99.99%
160-170	0.89	0-170	10042.06	100.00%
170-180	0.24	0-180	10042.30	100.00%

## 4.2 Goniophotometer Test

LCS/BUG

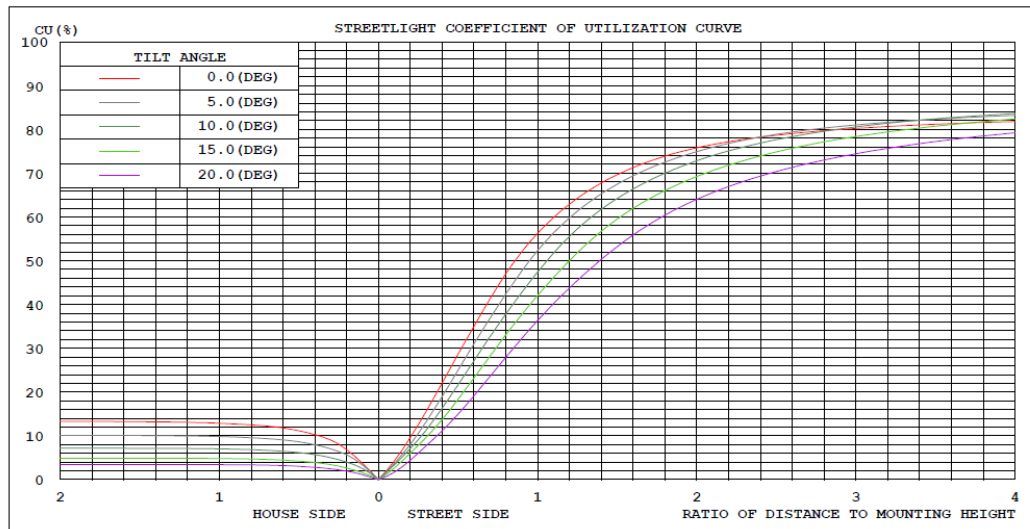


### LUMINAIRE CLASSIFICATION SYSTEM (LCS)

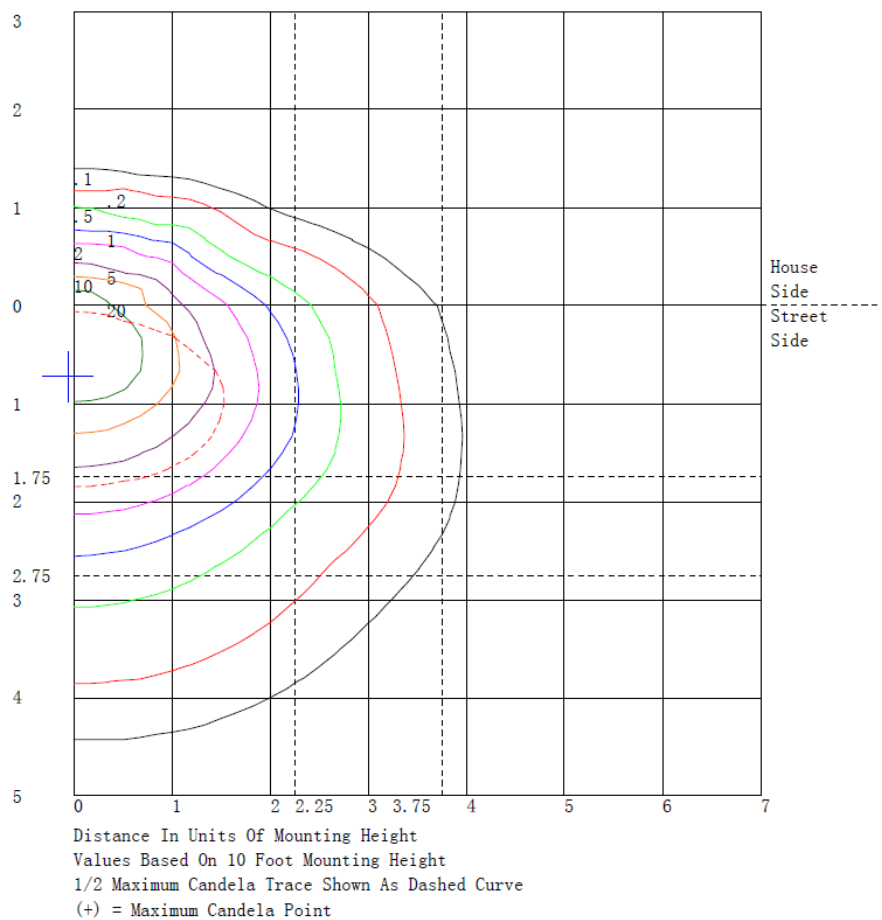
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1672.7	N.A.	16.7
FM - Front-Medium (30-60)	4791.0	N.A.	47.7
FH - Front-High (60-80)	1763.8	N.A.	17.6
FVH - Front-Very High (80-90)	201.0	N.A.	2.0
BL - Back-Low (0-30)	645.7	N.A.	6.4
BM - Back-Medium (30-60)	564.4	N.A.	5.6
BH - Back-High (60-80)	119.9	N.A.	1.2
BVH - Back-Very High (80-90)	14.8	N.A.	0.1
UL - Uplight-Low (90-100)	117.2	N.A.	1.2
UH - Uplight-High (100-180)	151.7	N.A.	1.5
Total	10042.2	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)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	2765	2763	2762	2760	2758	2756	2754	2751	2748	2746	2744	2742	2741	2739	2737	2735	2728	2721	2716
5	2762	2751	2740	2729	2700	2685	2701	2828	2964	3074	3026	2953	2893	2963	3060	3163	3218	3255	3274
10	2670	2622	2626	2680	2816	2981	3151	3265	3369	3470	3603	3728	3830	3860	3869	3872	3912	3952	3980
15	2561	2611	2695	2813	2972	3159	3368	3623	3865	4065	4123	4137	4133	4183	4236	4284	4314	4333	4341
20	2461	2573	2737	2953	3271	3602	3906	4071	4189	4275	4363	4443	4521	4615	4708	4796	4881	4947	4982
25	2260	2419	2626	2881	3230	3593	3939	4165	4357	4535	4763	4979	5165	5271	5342	5387	5434	5465	5481
30	2034	2320	2629	2961	3334	3715	4090	4445	4765	5034	5195	5307	5388	5474	5551	5620	5706	5777	5823
35	1928	2362	2767	3143	3477	3792	4094	4417	4729	5021	5267	5490	5696	5917	6110	6260	6307	6312	6294
40	1744	2208	2656	3090	3526	3934	4304	4571	4815	5060	5432	5787	6078	6154	6154	6109	6077	6047	6033
45	1732	2217	2660	3063	3393	3706	4023	4455	4872	5232	5413	5512	5545	5531	5484	5417	5347	5288	5255
50	1547	1959	2372	2788	3228	3653	4046	4389	4666	4862	4897	4865	4799	4772	4741	4707	4654	4609	4583
55	1363	1622	1944	2328	2863	3394	3852	4033	4112	4127	4156	4165	4160	4162	4154	4132	4064	3997	3953
60	1141	1408	1710	2046	2479	2900	3264	3438	3530	3558	3544	3505	3457	3446	3443	3444	3445	3448	3453
65	954	1227	1500	1774	2076	2357	2593	2720	2791	2817	2812	2781	2732	2675	2615	2559	2526	2504	2497
70	776	928	1097	1282	1524	1752	1937	1983	1976	1937	1897	1856	1823	1835	1858	1884	1889	1891	1892
75	554	624	708	808	954	1092	1201	1195	1161	1125	1155	1199	1246	1278	1304	1323	1326	1326	1326
80	439	444	461	490	544	601	650	663	663	653	638	621	606	602	602	604	606	607	610
85	182	194	211	232	261	292	322	343	360	375	389	402	417	436	456	476	496	513	522
90	38.9	61.6	83.3	104	123	142	160	170	184	207	258	317	377	428	472	506	520	526	526
95	27.6	39.5	52.1	65.3	77.1	91.1	109	137	168	200	230	257	278	283	283	280	277	274	272
100	35.6	34.5	34.9	36.7	35.7	39.2	50.7	87.0	127	164	177	182	185	195	206	215	221	224	226
105	25.9	21.8	22.1	26.8	40.0	54.5	67.2	68.6	66.9	63.7	63.0	62.7	63.3	64.6	67.4	71.7	80.3	89.5	98.3
110	16.9	13.9	17.8	28.6	54.9	81.5	102	90.6	73.8	58.4	67.3	80.4	93.1	92.6	88.8	83.7	80.2	77.7	76.8
115	22.1	14.3	13.6	20.0	38.9	60.8	81.5	92.7	97.5	94.8	75.2	52.5	31.9	29.1	31.5	36.9	40.9	44.6	47.1
120	16.2	8.03	6.73	12.3	29.2	49.7	70.3	83.7	93.9	101	103	103	99.5	91.3	81.8	72.6	66.1	62.3	61.9
125	11.7	4.95	3.96	8.73	22.4	39.5	57.5	71.5	83.8	93.8	100	105	107	107	107	105	104	102	102
130	8.47	2.05	0.71	4.43	15.8	30.3	46.0	58.9	71.0	81.8	91.4	99.2	105	106	106	105	104	103	102
135	1.77	0.66	2.18	6.33	14.0	23.6	34.6	46.0	57.6	68.9	78.9	87.8	95.2	100.0	103	106	108	109	110
140	1.53	4.29	7.50	11.1	15.0	19.4	24.7	31.8	39.6	47.8	56.1	64.0	71.1	76.1	80.2	84.0	89.3	93.8	96.4
145	1.56	2.92	4.70	6.89	9.32	12.3	15.9	20.8	26.2	32.2	38.9	45.5	51.6	55.7	59.0	61.7	64.4	66.3	67.2
150	1.60	2.96	3.76	3.98	2.32	1.08	1.25	6.70	13.4	20.1	23.4	26.1	28.5	32.2	35.8	39.1	41.5	43.2	43.9
155	1.73	1.43	1.47	1.87	2.70	3.82	5.14	6.40	7.88	9.66	12.2	15.0	17.5	19.4	21.0	22.1	22.8	23.2	23.3
160	1.91	1.86	1.86	1.90	2.07	2.22	2.30	1.87	1.56	1.60	2.73	4.30	6.18	8.37	10.5	12.2	12.9	13.1	12.9
165	2.06	2.11	2.14	2.15	2.08	2.02	2.00	2.11	2.30	2.59	3.22	3.77	4.07	3.40	2.52	1.67	1.50	1.51	1.63
170	2.24	2.27	2.30	2.31	2.32	2.31	2.29	2.25	2.20	2.15	2.10	2.05	2.02	2.03	2.06	2.09	2.12	2.14	2.17
175	2.36	2.40	2.42	2.43	2.43	2.41	2.40	2.38	2.37	2.35	2.31	2.27	2.23	2.19	2.15	2.11	2.09	2.07	2.08
180	2.61	2.62	2.62	2.62	2.60	2.58	2.55	2.54	2.52	2.50	2.46	2.42	2.38	2.34	2.31	2.28	2.23	2.20	2.17

C (DEG)		UNIT: cd																		
y		95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0		2721	2728	2735	2737	2739	2741	2742	2744	2746	2748	2751	2754	2756	2758	2760	2762	2763	2765	2766
5		3255	3218	3163	3060	2963	2893	2953	3026	3074	2964	2828	2701	2685	2700	2729	2740	2751	2762	2562
10		3952	3912	3872	3869	3860	3830	3728	3603	3470	3369	3265	3151	2981	2816	2680	2626	2622	2670	2476
15		4333	4314	4284	4236	4183	4133	4137	4123	4065	3865	3623	3368	3159	2972	2813	2695	2611	2561	2439
20		4947	4881	4796	4708	4615	4521	4443	4363	4275	4189	4071	3906	3602	3271	2953	2737	2573	2461	2407
25		5465	5434	5387	5342	5271	5165	4979	4763	4535	4357	4165	3939	3593	3230	2881	2626	2419	2260	2307
30		5777	5706	5620	5551	5474	5388	5307	5195	5034	4765	4445	4090	3715	3334	2961	2629	2320	2034	2147
35		6312	6307	6260	6110	5917	5696	5490	5267	5021	4729	4417	4094	3792	3477	3143	2767	2362	1928	2004
40		6047	6077	6109	6154	6154	6078	5787	5432	5060	4815	4571	4304	3934	3526	3090	2656	2208	1744	1678
45		5288	5347	5417	5484	5531	5545	5512	5413	5232	4872	4451	4023	3706	3393	3063	2660	2217	1732	1493
50		4609	4654	4707	4741	4772	4799	4865	4897	4862	4666	4389	4046	3653	3228	2788	2372	1959	1547	1194
55		3997	4064	4132	4154	4162	4160	4165	4156	4127	4112	4033	3852	3394	2863	2328	1944	1622	1363	1005
60		3448	3445	3444	3443	3446	3457	3505	3544	3558	3530	3438	3264	2900	2479	2046	1710	1408	1141	824
65		2504	2526	2559	2615	2675	2732	2781	2812	2817	2791	2720	2593	2357	2076	1774	1500	1227	954	688
70		1891	1889	1884	1858	1835	1823	1856	1897	1937	1976	1983	1937	1752	1524	1282	1097	928	776	568
75		1326	1326	1323	1304	1278	1246	1199	1155	1125	1161	1195	1201	1092	954	808	708	624	554	405
80		607	606	604	602	602	606	621	638	653	663	663	650	601	544	490	461	444	439	297
85		513	496	476	456	436	417	402	389	375	360	343	322	292	261	232	211	194	182	127
90		526	520	506	472	428	377	317	258	207	184	170	160	142	123	104	83.3	61.6	38.9	34.2
95		274	277	280	283	283	278	257	230	200	168	137	109	91.1	77.1	65.3	52.1	39.5	27.6	24.1
100		224	221	215	206	195	185	182	177	164	127	87.0	50.7	39.2	35.7	36.7	34.9	34.5	35.6	27.5
105		89.5	80.3	71.7	67.4	64.6	63.3	62.7	63.0	63.7	66.9	68.6	67.2	54.5	40.0	26.8	22.1	21.8	25.9	20.0
110		77.7	80.2	83.7	88.8	92.6	93.1	80.4	67.3	58.4	73.8	90.6	102	81.5	54.9	28.6	17.8	13.9	16.9	11.9
115		44.6	40.9	36.9	31.5	29.1	31.9	52.5	75.2	94.8	97.5	92.7	81.5	60.8	38.9	20.0	13.6	14.3	22.1	15.0
120		62.3	66.1	72.6	81.8	91.3	99.5	103	103	101	93.9	83.7	70.3	49.7	29.2	12.3	6.73	8.03	16.2	11.6
125		102	104	105	107	107	107	105	100	93.8	83.8	71.5	57.5	39.5	22.4	8.73	3.96	4.95	11.7	9.10
130		103	104	105	106	106	105	99.2	91.4	81.8	71.0	58.9	46.0	30.3	15.8	4.43	0.71	2.05	8.47	7.15
135		109	108	106	103	100.0	95.2	87.8	78.9	68.9	57.6	46.0	34.6	23.6	14.0	6.33	2.18	0.66	1.77	2.50
140		93.8	89.3	84.0	80.2	76.6	71.1	64.0	56.1	47.8	36.9	31.8	24.7	19.4	15.0	11.1	7.50	4.29	1.53	2.70
145		66.3	64.4	61.7	59.0	55.7	51.6	45.5	38.9	32.2	26.2	20.8	15.9	12.3	9.32	6.89	4.70	2.92	1.56	2.48
150		43.2	41.5	39.1	35.8	32.2	28.5	26.1	23.4	20.1	13.4	6.70	1.25	1.08	2.32	3.98	3.76	2.96	1.60	2.31
155		23.2	22.8	22.1	21.0	19.4	17.5	15.0	12.2	9.66	7.88	6.40	5.14	3.82	2.70	1.97	1.47	1.43	1.73	2.46
160		13.1	12.9	12.2	10.5	8.37	6.18	4.30	2.73	1.60	1.56	1.87	2.30	2.22	2.07	1.90	1.86	1.86	1.91	2.72
165		1.51	1.50	1.67	2.52	3.40	4.07	3.77	3.22	2.59	2.30	2.11	2.00	2.02	2.08	2.15	2.14	2.11	2.06	2.84
170		2.14	2.11	2.09	2.06	2.03	2.02	2.05	2.10	2.15	2.20	2.25	2.29	2.31	2.32	2.31	2.30	2.27	2.24	2.85
175		2.07	2.09	2.11	2.15	2.19	2.23	2.27	2.31	2.35	2.37	2.38	2.40	2.41	2.43	2.43	2.42	2.40	2.36	2.80
180		2.20	2.23	2.28	2.31	2.34	2.38	2.42	2.46	2.50	2.52	2.54	2.55	2.58	2.60	2.62	2.62	2.62	2.61	2.80



Table--3

UNIT: cd

C (DEG) y (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	2732	2722	2718	2718	2718	2715	2713	2711	2714	2719	2723	2727	2729	2730	2725	2719	2716	2719	2725
5	2410	2308	2277	2278	2296	2288	2282	2283	2306	2331	2349	2336	2316	2295	2287	2283	2282	2283	2287
10	2335	2247	2240	2265	2300	2299	2285	2258	2200	2137	2077	2048	2029	2015	1996	1982	1976	1982	1996
15	2343	2271	2246	2230	2207	2132	2039	1933	1819	1704	1592	1490	1403	1336	1311	1304	1310	1304	1311
20	2342	2266	2190	2094	1970	1772	1557	1341	1165	1012	888	811	760	731	710	701	700	701	710
25	2287	2201	2022	1796	1540	1263	1002	782	688	643	629	609	599	595	587	582	580	582	587
30	2147	2033	1725	1364	1012	827	701	622	580	562	554	523	491	462	443	430	425	430	443
35	1966	1815	1450	1047	681	579	549	553	491	429	370	326	290	263	245	234	231	234	245
40	1561	1395	1127	849	597	491	430	393	326	265	213	182	162	150	142	139	139	139	142
45	1267	1055	848	661	501	393	314	255	204	168	144	138	140	146	145	144	143	144	145
50	907	686	557	474	415	323	241	174	149	139	135	117	98.5	82.6	73.7	68.7	67.2	68.7	73.7
55	719	505	391	328	293	234	182	139	109	87.0	71.7	61.5	55.5	52.5	50.0	49.1	49.2	49.1	50.0
60	571	382	282	228	200	156	119	89.3	67.8	52.5	42.4	36.7	33.9	32.6	29.5	27.1	25.8	27.1	29.5
65	474	310	216	160	128	92.0	65.6	46.2	30.2	18.5	10.5	5.25	2.28	0.99	0.39	0.48	0.93	0.48	0.39
70	397	263	176	118	81.1	48.3	26.0	12.1	4.24	1.04	0.84	0.27	0.55	1.24	1.28	1.28	1.25	1.28	1.28
75	281	182	115	68.6	39.2	20.6	11.2	7.81	3.68	1.65	1.05	0.76	0.98	1.46	1.55	1.60	1.60	1.60	1.55
80	183	99.3	54.3	31.1	22.0	12.2	7.35	5.62	3.19	1.82	1.25	1.10	1.30	1.66	1.79	1.89	1.92	1.89	1.79
85	82.7	49.1	29.5	18.2	12.6	7.81	5.35	4.33	2.91	2.02	1.56	1.49	1.65	1.93	2.09	2.22	2.29	2.22	2.09
90	29.5	24.6	19.1	14.0	9.46	6.80	4.99	3.81	2.87	2.29	2.00	1.94	2.05	2.24	2.38	2.52	2.61	2.52	2.38
95	20.7	17.4	14.0	10.8	8.02	6.14	4.75	3.78	3.13	2.74	2.56	2.48	2.52	2.62	2.80	2.97	3.10	2.97	2.80
100	20.7	15.3	11.6	8.90	7.07	5.61	4.60	3.95	3.45	3.14	3.00	2.94	2.97	3.08	3.28	3.49	3.64	3.49	3.28
105	15.0	10.8	7.29	4.67	2.94	2.60	2.87	3.45	3.62	3.77	3.87	3.84	3.80	3.78	3.97	4.17	4.33	4.17	3.97
110	8.19	5.69	5.07	5.19	5.55	4.76	3.89	3.13	2.99	3.05	3.24	3.37	3.53	3.72	3.93	4.12	4.23	4.12	3.93
115	9.62	5.88	4.56	4.33	4.64	4.07	3.54	3.13	3.08	3.15	3.29	3.33	3.37	3.41	3.44	3.46	3.47	3.46	3.44
120	8.07	5.51	4.35	3.89	3.82	3.41	3.10	2.91	2.96	3.09	3.25	3.32	3.37	3.41	3.44	3.46	3.46	3.46	3.44
125	7.00	5.37	4.37	3.74	3.38	3.06	2.89	2.85	2.96	3.14	3.34	3.44	3.52	3.57	3.62	3.64	3.65	3.64	3.62
130	6.01	5.03	4.20	3.55	3.09	2.90	2.87	2.94	3.04	3.18	3.34	3.51	3.68	3.82	3.89	3.93	3.94	3.93	3.89
135	3.01	3.32	3.31	3.17	2.99	2.98	3.01	3.09	3.23	3.40	3.57	3.71	3.82	3.91	3.97	4.00	4.01	4.00	3.97
140	3.59	4.03	3.84	3.43	2.99	2.97	3.04	3.18	3.29	3.41	3.56	3.75	3.93	4.09	4.15	4.17	4.17	4.17	4.15
145	3.14	3.52	3.49	3.31	3.08	3.12	3.20	3.32	3.43	3.55	3.68	3.86	4.04	4.18	4.22	4.21	4.18	4.21	4.22
150	2.83	3.18	3.26	3.22	3.16	3.24	3.35	3.46	3.54	3.63	3.71	3.86	3.99	4.09	4.09	4.05	3.99	4.05	4.09
155	3.01	3.39	3.52	3.53	3.47	3.45	3.43	3.43	3.48	3.55	3.64	3.75	3.84	3.90	3.85	3.78	3.71	3.78	3.85
160	3.32	3.72	3.84	3.82	3.71	3.64	3.58	3.53	3.56	3.60	3.64	3.61	3.57	3.52	3.49	3.47	3.44	3.47	3.49
165	3.42	3.80	3.87	3.81	3.68	3.63	3.58	3.52	3.46	3.39	3.32	3.20	3.09	3.00	2.99	3.01	3.03	3.01	2.99
170	3.30	3.57	3.60	3.50	3.33	3.17	3.00	2.84	2.78	2.74	2.71	2.65	2.59	2.53	2.50	2.48	2.48	2.48	2.50
175	3.11	3.29	3.30	3.21	3.05	2.86	2.67	2.50	2.47	2.47	2.48	2.40	2.32	2.25	2.26	2.29	2.33	2.29	2.26
180	2.61	2.61	2.61	2.61	2.59	2.55	2.49	2.43	2.36	2.30	2.25	2.22	2.20	2.20	2.22	2.24	2.26	2.24	2.22

																UNIT: cd			
y (DEG)	C (DEG)																		
	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	2730	2729	2727	2723	2719	2714	2711	2713	2715	2718	2718	2718	2722	2732	2746				
5	2295	2316	2336	2349	2331	2306	2283	2282	2288	2296	2278	2277	2308	2410	2562				
10	2015	2029	2048	2077	2137	2200	2258	2285	2299	2300	2265	2240	2247	2335	2476				
15	1336	1403	1490	1592	1704	1819	1933	2039	2132	2207	2230	2246	2271	2343	2439				
20	731	760	811	888	1012	1165	1341	1557	1772	1970	2094	2190	2266	2342	2407				
25	595	599	609	629	643	688	782	1002	1263	1540	1796	2022	2201	2287	2307				
30	462	491	523	554	562	580	622	701	827	1012	1364	1725	2033	2147	2147				
35	263	290	326	370	429	491	553	549	579	681	1047	1450	1815	1966	2004				
40	150	162	182	213	265	326	393	430	491	597	849	1127	1395	1561	1678				
45	146	140	138	144	168	204	255	314	393	501	661	848	1055	1267	1493				
50	82.6	98.5	117	135	139	149	174	241	323	415	474	557	686	907	1194				
55	52.5	55.5	61.5	71.7	87.0	109	139	182	234	293	328	391	505	719	1005				
60	32.6	33.9	36.7	42.4	52.5	67.8	89.3	119	156	200	228	282	382	571	824				
65	0.99	2.28	5.25	10.5	18.5	30.2	46.2	65.6	92.0	128	160	216	310	474	688				
70	1.24	0.55	0.27	0.84	1.04	4.24	12.1	26.0	48.3	81.1	118	176	263	397	568				
75	1.46	0.98	0.76	1.05	1.65	3.68	7.81	11.2	20.6	39.2	68.6	115	182	281	405				
80	1.66	1.30	1.10	1.25	1.82	3.19	5.62	7.35	12.2	22.0	31.1	54.3	99.3	183	297				
85	1.93	1.65	1.49	1.56	2.02	2.91	4.33	5.35	7.81	12.6	18.2	29.5	49.1	82.7	127				
90	2.24	2.05	1.94	2.00	2.29	2.87	3.81	4.99	6.80	9.46	14.0	19.1	24.6	29.5	34.2				
95	2.62	2.52	2.48	2.56	2.74	3.13	3.78	4.75	6.14	8.02	10.8	14.0	17.4	20.7	24.1				
100	3.08	2.97	2.94	3.00	3.14	3.45	3.95	4.60	5.61	7.07	8.90	11.6	15.3	20.7	27.5				
105	3.78	3.80	3.84	3.87	3.77	3.62	3.45	2.87	2.60	2.94	4.67	7.29	10.8	15.0	20.0				
110	3.72	3.53	3.37	3.24	3.05	2.99	3.13	3.89	4.76	5.55	5.19	5.07	5.69	8.19	11.9				
115	3.41	3.37	3.33	3.29	3.15	3.08	3.13	3.54	4.07	4.64	4.33	4.56	5.88	9.62	15.0				
120	3.41	3.37	3.32	3.25	3.09	2.96	2.91	3.10	3.41	3.82	3.89	4.35	5.51	8.07	11.6				
125	3.57	3.52	3.44	3.34	3.14	2.96	2.85	2.89	3.06	3.38	3.74	4.37	5.37	7.00	9.10				
130	3.82	3.68	3.51	3.34	3.18	3.04	2.94	2.87	2.90	3.09	3.55	4.20	5.03	6.01	7.15				
135	3.91	3.82	3.71	3.57	3.40	3.23	3.09	3.01	2.98	2.99	3.17	3.31	3.32	3.01	2.50				
140	4.09	3.93	3.75	3.56	3.41	3.29	3.18	3.04	2.97	2.99	3.43	3.84	4.03	3.59	2.76				
145	4.18	4.04	3.86	3.68	3.55	3.43	3.32	3.20	3.12	3.08	3.31	3.49	3.52	3.14	2.48				
150	4.09	3.99	3.86	3.71	3.63	3.54	3.46	3.35	3.24	3.16	3.22	3.26	3.18	2.83	2.31				
155	3.90	3.84	3.75	3.64	3.55	3.48	3.43	3.43	3.45	3.47	3.53	3.52	3.39	3.01	2.46				
160	3.52	3.57	3.61	3.64	3.60	3.56	3.53	3.58	3.64	3.71	3.82	3.84	3.72	3.32	2.72				
165	3.00	3.09	3.20	3.32	3.39	3.46	3.52	3.58	3.63	3.68	3.81	3.87	3.80	3.42	2.84				
170	2.53	2.59	2.65	2.71	2.74	2.78	2.84	3.00	3.17	3.33	3.50	3.60	3.57	3.30	2.85				
175	2.25	2.32	2.40	2.48	2.47	2.47	2.50	2.67	2.86	3.05	3.21	3.30	3.29	3.11	2.80				
180	2.20	2.20	2.22	2.25	2.30	2.36	2.43	2.49	2.55	2.59	2.61	2.61	2.61	2.61	2.61				

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

<b>Model No.</b>	WPX3 @ 65W / 4000K	<b>Sample ID</b>	231020001-S1
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

<b>Test Method</b>
<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	0.539	64.2	0.993	5.11
277.0	60	0.263	63.4	0.870	12.15



## 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\*\*\*\*\*