

## 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		17057
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		130.0
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		16601
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	126.5
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		131.2
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	4.11
			277V	6.54
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.998
			277V	0.961
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3045±175	3128
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		82.6
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		6
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		97
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		1.096
(Goniophotometer – Section 4.2)		Non-Worst Case		0.479
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		131.2
(Goniophotometer – Section 4.2)		Non-Worst Case		127.5

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-10-20	WPX3 @ 130W / 3000K	231020001-S1
2	Goniophotometer Test	2023-10-20	WPX3 @ 130W / 3000K	231020001-S1
3	THD and PF Test	2023-10-20	WPX3 @ 130W / 3000K	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 @ 130W / 3000K, color tunable from 3000K, 4000K and 5000K.

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

### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

<b>Model No.</b>	WPX3 @ 130W / 3000K	<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

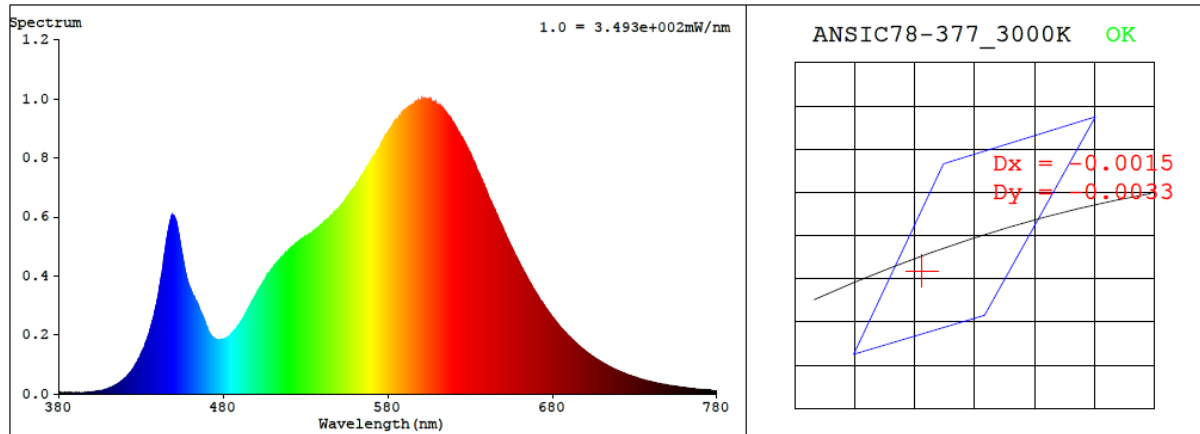
<b>Test Method</b>
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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.</p> <p>Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780nm.</p>

#### Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	1.096	131.2	0.998
277.0	60	0.479	127.5	0.961

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3128	82.6	6	-0.0011	84	97	-11%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.4266$   $y = 0.3975$  /  $u' = 0.2467$   $v' = 0.5172$  ( $duv = -1.12e-03$ )

CCT= 3128K Prcp WL: Ld=582.7nm Purity=47.3%

Peak WL: Lp=601nm FWHM: =133.2nm Ratio:R=22.2% G=75.2% B=2.6%

Render Index: Ra = 82.6 AvgR = 76.8 TM30:Rf=83 Rg=97

EEL: 0.10188 A++ Highest

R1 =81	R2 =90	R3 =96	R4 =81	R5 =81	R6 =88	R7 =83
R8 =60	R9 =6	R10=78	R11=81	R12=72	R13=83	R14=98 R15=74

## 4.1 Integrating Sphere Test

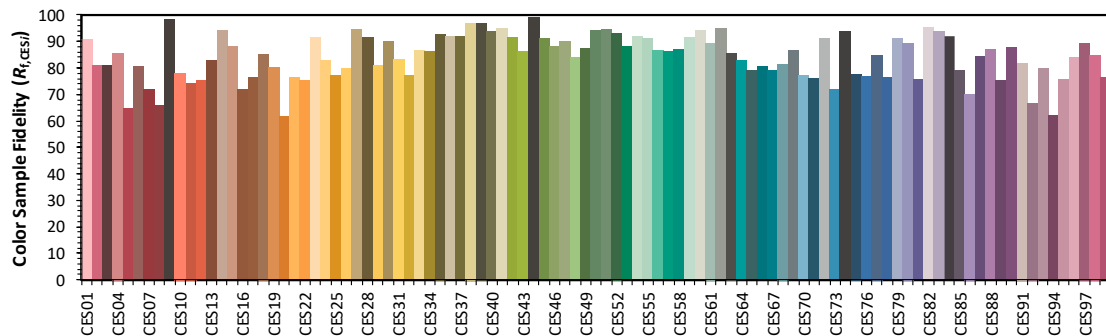
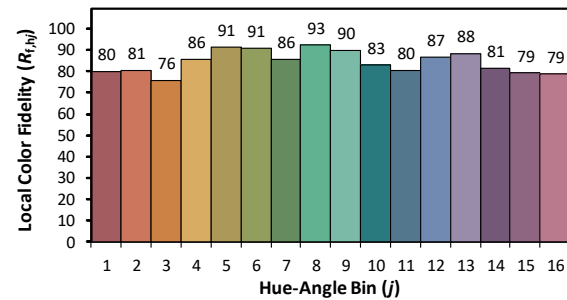
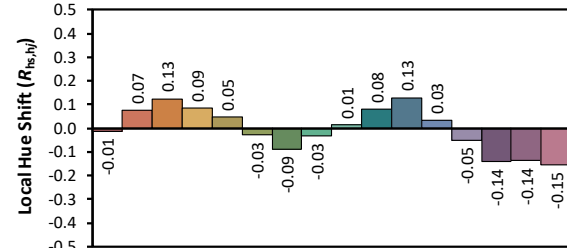
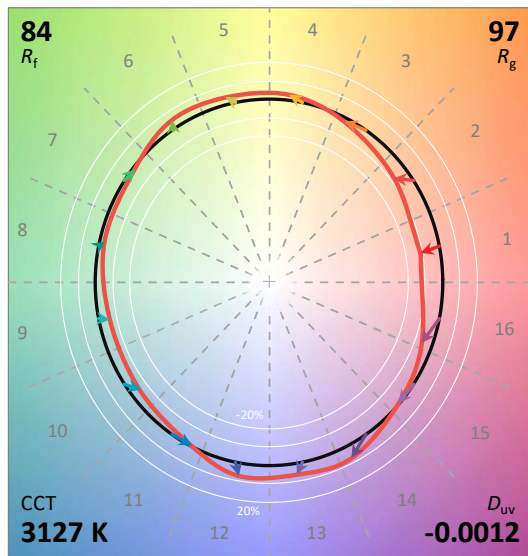
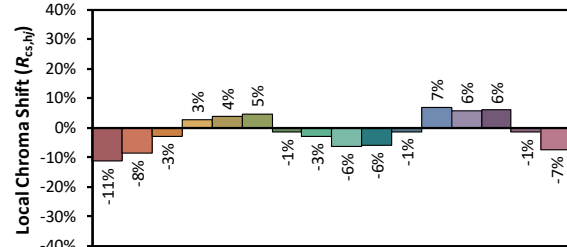
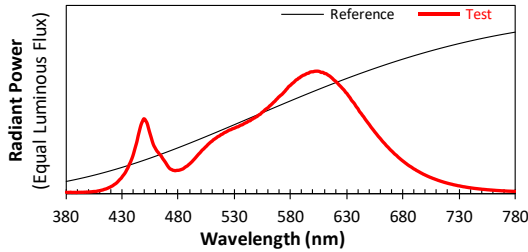
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/10/26

Model: WPX3 @ 130W / 3000K



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

$x$  0.4266

$y$  0.3974

$u'$  0.2467

$v'$  0.5172

CIE 13.3-1995  
(CRI)

$R_a$  83

$R_g$  6

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	5.40E-06	447	5.68E-04	514	4.53E-04	581	8.94E-04	648	5.85E-04	715	9.19E-05
381	3.10E-06	448	5.88E-04	515	4.61E-04	582	9.02E-04	649	5.72E-04	716	8.89E-05
382	4.10E-06	449	6.07E-04	516	4.65E-04	583	9.09E-04	650	5.61E-04	717	8.61E-05
383	3.80E-06	450	6.04E-04	517	4.71E-04	584	9.19E-04	651	5.47E-04	718	8.35E-05
384	5.50E-06	451	5.89E-04	518	4.78E-04	585	9.28E-04	652	5.34E-04	719	8.09E-05
385	2.70E-06	452	5.72E-04	519	4.81E-04	586	9.31E-04	653	5.23E-04	720	7.84E-05
386	3.90E-06	453	5.40E-04	520	4.88E-04	587	9.41E-04	654	5.11E-04	721	7.59E-05
387	3.50E-06	454	5.06E-04	521	4.95E-04	588	9.44E-04	655	4.99E-04	722	7.37E-05
388	4.20E-06	455	4.75E-04	522	4.98E-04	589	9.53E-04	656	4.88E-04	723	7.16E-05
389	2.40E-06	456	4.44E-04	523	5.03E-04	590	9.58E-04	657	4.76E-04	724	6.95E-05
390	4.20E-06	457	4.13E-04	524	5.08E-04	591	9.64E-04	658	4.64E-04	725	6.68E-05
391	4.40E-06	458	3.88E-04	525	5.14E-04	592	9.67E-04	659	4.54E-04	726	6.50E-05
392	4.50E-06	459	3.72E-04	526	5.17E-04	593	9.71E-04	660	4.44E-04	727	6.29E-05
393	4.60E-06	460	3.55E-04	527	5.20E-04	594	9.77E-04	661	4.32E-04	728	6.12E-05
394	4.90E-06	461	3.41E-04	528	5.26E-04	595	9.81E-04	662	4.21E-04	729	5.86E-05
395	4.40E-06	462	3.31E-04	529	5.28E-04	596	9.82E-04	663	4.11E-04	730	5.76E-05
396	5.70E-06	463	3.17E-04	530	5.32E-04	597	9.90E-04	664	4.02E-04	731	5.58E-05
397	5.00E-06	464	3.10E-04	531	5.36E-04	598	9.92E-04	665	3.90E-04	732	5.37E-05
398	6.90E-06	465	2.96E-04	532	5.41E-04	599	9.93E-04	666	3.81E-04	733	5.19E-05
399	6.00E-06	466	2.81E-04	533	5.42E-04	600	9.94E-04	667	3.72E-04	734	5.00E-05
400	6.70E-06	467	2.68E-04	534	5.47E-04	601	9.97E-04	668	3.61E-04	735	4.91E-05
401	7.70E-06	468	2.55E-04	535	5.53E-04	602	9.98E-04	669	3.52E-04	736	4.71E-05
402	8.30E-06	469	2.41E-04	536	5.57E-04	603	9.98E-04	670	3.43E-04	737	4.56E-05
403	9.20E-06	470	2.26E-04	537	5.59E-04	604	9.98E-04	671	3.34E-04	738	4.41E-05
404	1.05E-05	471	2.13E-04	538	5.66E-04	605	9.97E-04	672	3.25E-04	739	4.26E-05
405	1.13E-05	472	2.02E-04	539	5.71E-04	606	9.94E-04	673	3.16E-04	740	4.17E-05
406	1.13E-05	473	1.95E-04	540	5.75E-04	607	9.88E-04	674	3.09E-04	741	4.00E-05
407	1.26E-05	474	1.91E-04	541	5.79E-04	608	9.89E-04	675	3.00E-04	742	3.89E-05
408	1.52E-05	475	1.86E-04	542	5.86E-04	609	9.88E-04	676	2.91E-04	743	3.75E-05
409	1.66E-05	476	1.84E-04	543	5.90E-04	610	9.80E-04	677	2.84E-04	744	3.63E-05
410	1.83E-05	477	1.82E-04	544	5.93E-04	611	9.79E-04	678	2.75E-04	745	3.53E-05
411	2.07E-05	478	1.84E-04	545	6.02E-04	612	9.75E-04	679	2.68E-04	746	3.43E-05
412	2.27E-05	479	1.85E-04	546	6.06E-04	613	9.68E-04	680	2.61E-04	747	3.32E-05
413	2.53E-05	480	1.85E-04	547	6.12E-04	614	9.62E-04	681	2.54E-04	748	3.21E-05
414	2.92E-05	481	1.87E-04	548	6.16E-04	615	9.56E-04	682	2.46E-04	749	3.13E-05
415	3.12E-05	482	1.90E-04	549	6.23E-04	616	9.48E-04	683	2.40E-04	750	3.01E-05
416	3.44E-05	483	1.93E-04	550	6.27E-04	617	9.40E-04	684	2.32E-04	751	2.90E-05
417	3.85E-05	484	1.97E-04	551	6.35E-04	618	9.31E-04	685	2.26E-04	752	2.86E-05
418	4.30E-05	485	2.04E-04	552	6.41E-04	619	9.22E-04	686	2.19E-04	753	2.75E-05
419	4.68E-05	486	2.11E-04	553	6.46E-04	620	9.16E-04	687	2.14E-04	754	2.68E-05
420	5.21E-05	487	2.17E-04	554	6.57E-04	621	9.07E-04	688	2.08E-04	755	2.56E-05
421	5.65E-05	488	2.22E-04	555	6.64E-04	622	8.97E-04	689	2.01E-04	756	2.50E-05
422	6.29E-05	489	2.31E-04	556	6.71E-04	623	8.87E-04	690	1.95E-04	757	2.43E-05
423	6.98E-05	490	2.38E-04	557	6.81E-04	624	8.77E-04	691	1.91E-04	758	2.34E-05
424	7.53E-05	491	2.47E-04	558	6.88E-04	625	8.68E-04	692	1.84E-04	759	2.30E-05
425	8.30E-05	492	2.56E-04	559	6.94E-04	626	8.58E-04	693	1.80E-04	760	2.20E-05
426	9.22E-05	493	2.66E-04	560	7.00E-04	627	8.48E-04	694	1.74E-04	761	2.15E-05
427	1.03E-04	494	2.76E-04	561	7.11E-04	628	8.38E-04	695	1.69E-04	762	2.07E-05
428	1.12E-04	495	2.86E-04	562	7.18E-04	629	8.24E-04	696	1.64E-04	763	1.99E-05
429	1.21E-04	496	2.97E-04	563	7.27E-04	630	8.16E-04	697	1.59E-04	764	1.94E-05
430	1.35E-04	497	3.08E-04	564	7.36E-04	631	8.03E-04	698	1.54E-04	765	1.88E-05
431	1.46E-04	498	3.18E-04	565	7.45E-04	632	7.90E-04	699	1.50E-04	766	1.83E-05
432	1.58E-04	499	3.27E-04	566	7.53E-04	633	7.79E-04	700	1.45E-04	767	1.76E-05
433	1.73E-04	500	3.38E-04	567	7.64E-04	634	7.62E-04	701	1.41E-04	768	1.70E-05
434	1.91E-04	501	3.49E-04	568	7.73E-04	635	7.51E-04	702	1.37E-04	769	1.67E-05
435	2.07E-04	502	3.57E-04	569	7.84E-04	636	7.41E-04	703	1.33E-04	770	1.60E-05
436	2.30E-04	503	3.66E-04	570	7.92E-04	637	7.29E-04	704	1.29E-04	771	1.55E-05
437	2.48E-04	504	3.76E-04	571	8.00E-04	638	7.13E-04	705	1.25E-04	772	1.49E-05
438	2.70E-04	505	3.84E-04	572	8.06E-04	639	7.00E-04	706	1.21E-04	773	1.44E-05
439	2.94E-04	506	3.94E-04	573	8.16E-04	640	6.89E-04	707	1.18E-04	774	1.40E-05
440	3.23E-04	507	4.03E-04	574	8.26E-04	641	6.71E-04	708	1.15E-04	775	1.37E-05
441	3.57E-04	508	4.11E-04	575	8.35E-04	642	6.59E-04	709	1.11E-04	776	1.34E-05
442	3.89E-04	509	4.19E-04	576	8.48E-04	643	6.48E-04	710	1.08E-04	777	1.30E-05
443	4.22E-04	510	4.25E-04	577	8.57E-04	644	6.35E-04	711	1.04E-04	778	1.26E-05
444	4.65E-04	511	4.35E-04	578	8.70E-04	645	6.24E-04	712	1.01E-04	779	1.26E-05
445	5.02E-04	512	4.41E-04	579	8.78E-04	646	6.10E-04	713	9.78E-05	780	1.26E-05
446	5.38E-04	513	4.47E-04	580	8.85E-04	647	5.97E-04	714	9.47E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	WPX3 @ 130W / 3000K	<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	1.096	131.2	0.998
<b>NON-WORST CASE</b>	277.0	60	0.479	127.5	0.961

#### Test Result

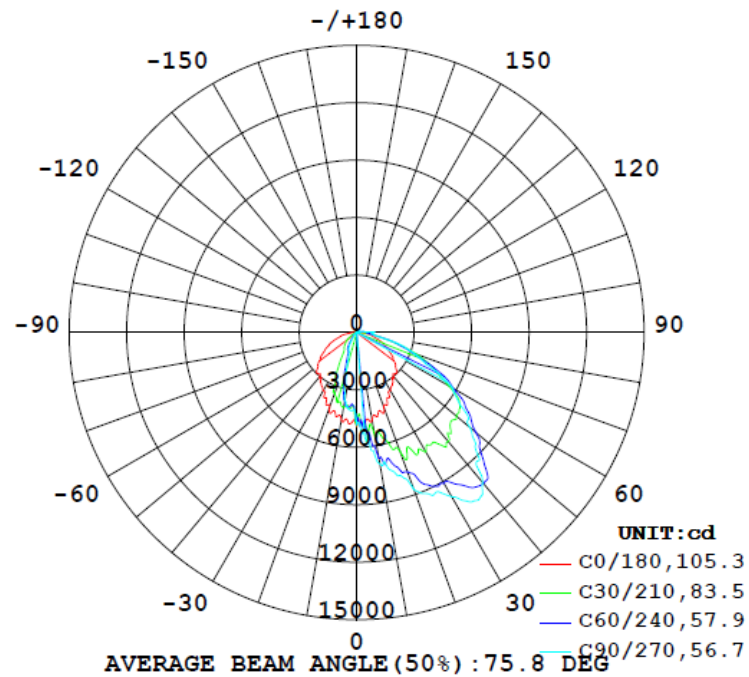
Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement (80°-90°)	BUG
		C0-180	C90-270	C0-180	C90-270			
<b>0°-180° zones</b>	17057	105.9	147.6	55.7	100.5	130.0	2.1%	B3-U3-G3
<b>0°-90° zones</b>	16601	105.9	147.6	55.7	100.5	126.5	2.2%	B3-U3-G3



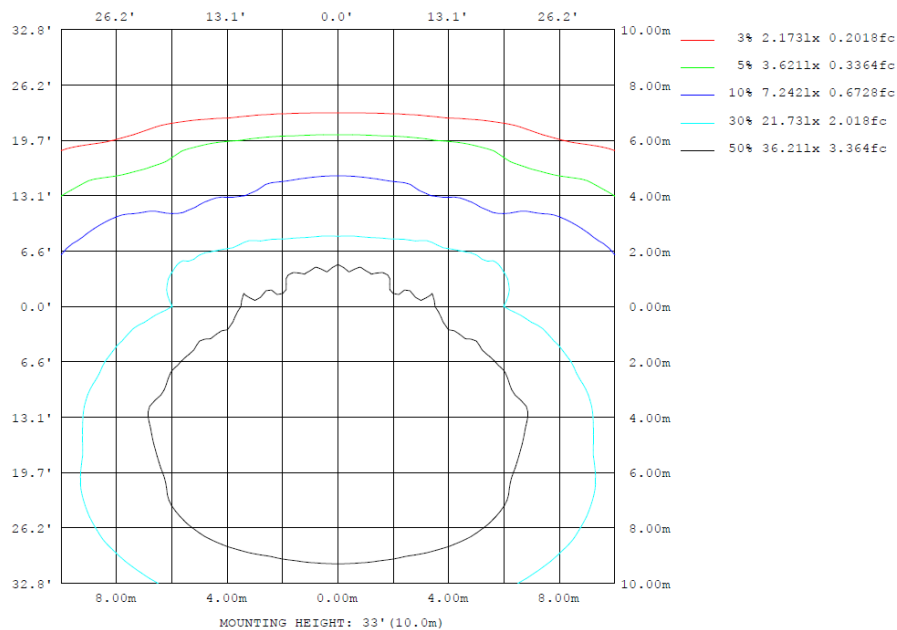
## 4.2 Goniophotometer Test

### Lighting Distribution Curve

#### LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

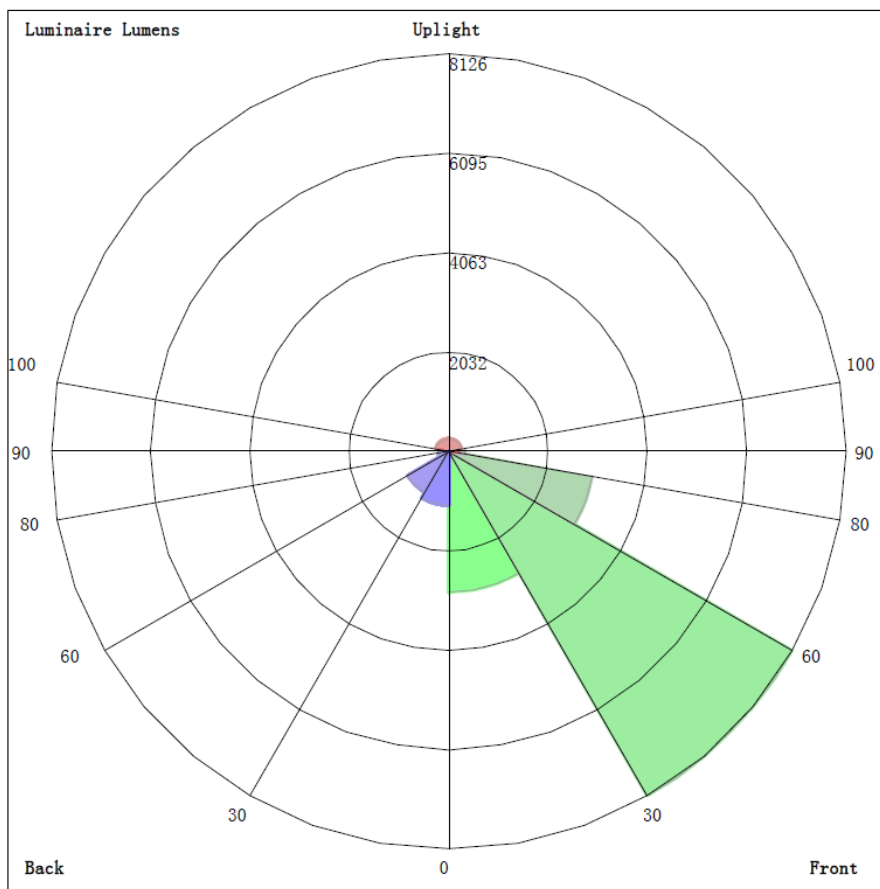
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	464.1	589.7	696.9	589.7	464.1	373.0	363.3	373.0	0- 10	437.5	437.5	2.57,2.57
20	415.4	740.2	870.0	740.2	415.4	230.2	120.3	230.2	10- 20	1346	1783	10.5,10.5
30	351.7	855.8	990.7	855.8	351.7	105.8	72.65	105.8	20- 30	2181	3965	23.2,23.2
40	300.2	854.0	1021	854.0	300.2	67.69	23.88	67.69	30- 40	2952	6916	40.5,40.5
50	265.6	828.0	770.2	828.0	265.6	30.02	11.29	30.02	40- 50	3240	10157	59.5,59.5
60	195.8	598.5	575.9	598.5	195.8	15.28	5.355	15.28	50- 60	2899	13056	76.5,76.5
70	131.6	328.7	314.8	328.7	131.6	2.577	0.1955	2.577	60- 70	2116	15171	88.9,88.9
80	73.05	109.5	102.2	109.5	73.05	0.9441	0.3186	0.9441	70- 80	1063	16234	95.2,95.2
90	7.138	34.49	89.13	34.49	7.138	0.6389	0.4292	0.6389	80- 90	366.7	16601	97.3,97.3
100	6.046	27.95	38.28	27.95	6.046	0.6629	0.6056	0.6629	90-100	197.5	16798	98.5,98.5
110	3.318	9.964	13.19	9.964	3.318	0.5230	0.7045	0.5230	100-110	78.42	16877	98.9,98.9
120	2.754	17.10	10.72	17.10	2.754	0.4874	0.5803	0.4874	110-120	53.90	16931	99.3,99.3
130	1.435	13.98	17.54	13.98	1.435	0.4939	0.6629	0.4939	120-130	56.38	16987	99.6,99.6
140	0.2577	8.044	16.37	8.044	0.2577	0.5365	0.7053	0.5365	130-140	41.75	17029	99.8,99.8
150	0.2719	3.365	7.308	3.365	0.2719	0.5859	0.6785	0.5859	140-150	19.97	17049	100,100
160	0.3242	0.2745	2.146	0.2745	0.3242	0.5969	0.5867	0.5969	150-160	5.972	17055	100,100
170	0.3810	0.3645	0.3661	0.3645	0.3810	0.4816	0.4227	0.4816	160-170	1.545	17056	100,100
180	0.4461	0.4250	0.3522	0.4250	0.4461	0.4126	0.3855	0.4126	170-180	0.4009	17057	100,100
DEG	LUMINOUS INTENSITY:×10cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	437.53	0-10	437.53	2.57%
10-20	1345.93	0-20	1783.46	10.46%
20-30	2181.27	0-30	3964.73	23.25%
30-40	2951.58	0-40	6916.31	40.55%
40-50	3240.22	0-50	10156.53	59.55%
50-60	2899.00	0-60	13055.53	76.54%
60-70	2115.89	0-70	15171.42	88.95%
70-80	1062.67	0-80	16234.09	95.18%
80-90	366.67	0-90	16600.76	97.33%
90-100	197.49	0-100	16798.25	98.49%
100-110	78.42	0-110	16876.67	98.95%
110-120	53.90	0-120	16930.57	99.26%
120-130	56.38	0-130	16986.95	99.59%
130-140	41.75	0-140	17028.70	99.84%
140-150	19.97	0-150	17048.67	99.96%
150-160	5.97	0-160	17054.64	99.99%
160-170	1.54	0-170	17056.18	100.00%
170-180	0.40	0-180	17056.58	100.00%

## 4.2 Goniophotometer Test

LCS/BUG

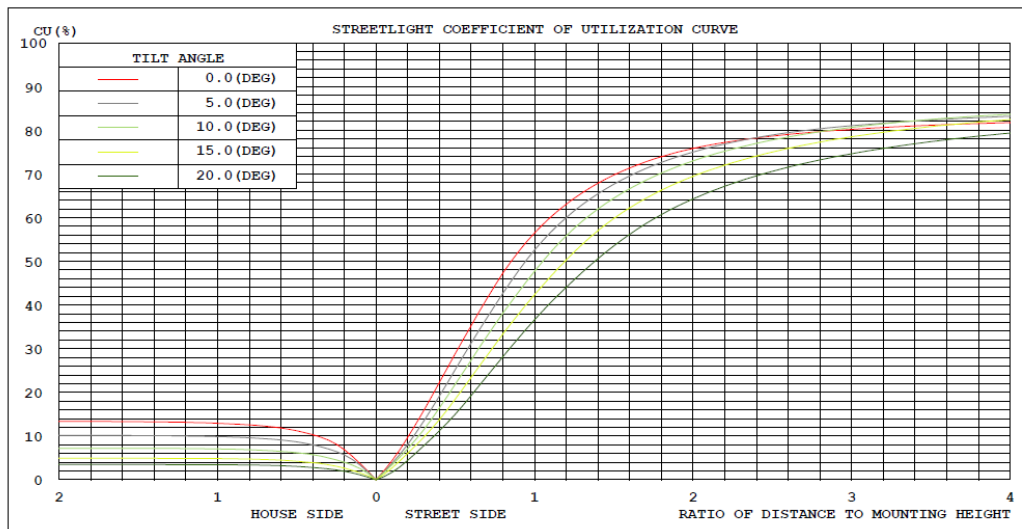


### LUMINAIRE CLASSIFICATION SYSTEM (LCS)

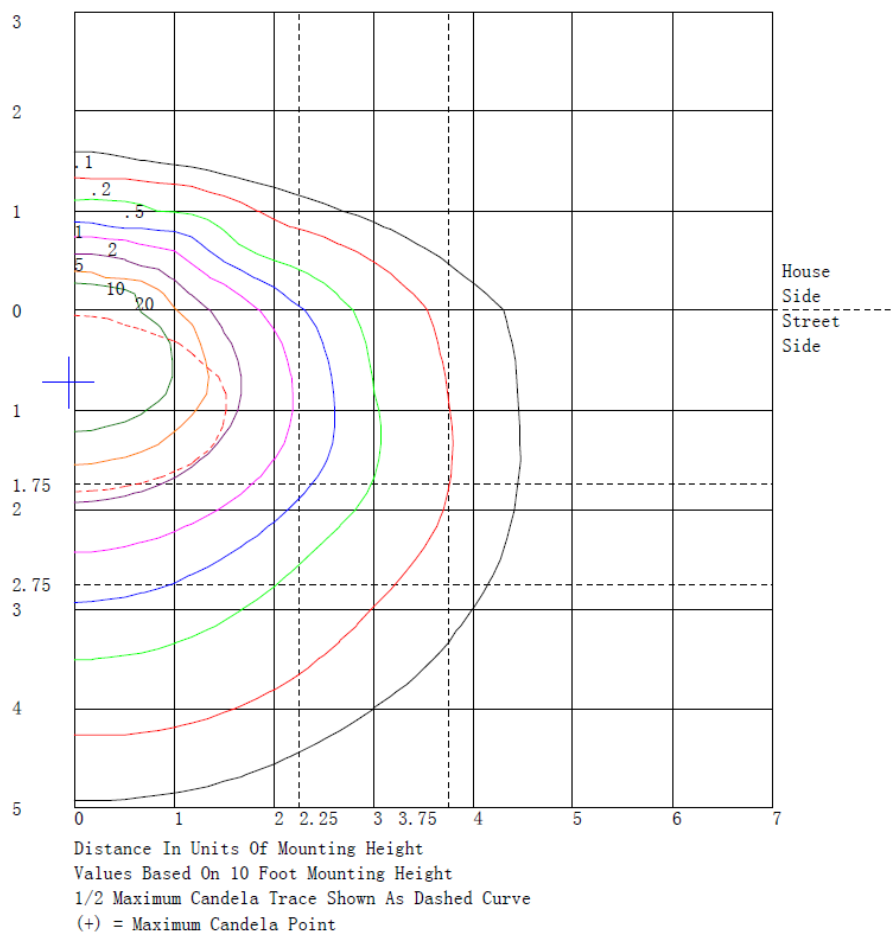
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	2865.4	N.A.	16.8
FM - Front-Medium (30-60)	8126.2	N.A.	47.6
FH - Front-High (60-80)	2972.9	N.A.	17.4
FVH - Front-Very High (80-90)	341.9	N.A.	2.0
BL - Back-Low (0-30)	1099.3	N.A.	6.4
BM - Back-Medium (30-60)	964.6	N.A.	5.7
BH - Back-High (60-80)	205.7	N.A.	1.2
BVH - Back-Very High (80-90)	24.8	N.A.	0.1
UL - Uplight-Low (90-100)	197.5	N.A.	1.2
UH - Uplight-High (100-180)	258.3	N.A.	1.5
Total	17056.6	N.A.	100.0
BUG Rating	B3-U3-G3		

## 4.2 Goniophotometer Test

### Coefficients of Utilization



### Isolines



## 4.2 Goniophotometer Test

### Luminous Distribution Intensity Data

Table--1

UNIT: ×10cd

C (DEG) γ (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	489	489	488	488	487	487	486	485	484	483	482	481	480	479	478	478	478	478	478
5	479	478	477	475	470	467	469	487	506	521	509	495	484	499	521	544	560	572	578
10	464	456	456	466	490	518	547	562	575	590	618	646	668	667	661	656	670	686	697
15	435	448	466	488	514	544	577	622	665	700	707	707	704	712	721	732	741	748	753
20	415	449	485	524	571	618	661	693	719	740	754	765	775	792	810	828	846	862	870
25	375	408	447	493	553	615	674	716	751	783	818	850	877	892	903	911	923	934	939
30	352	401	455	514	584	654	721	774	819	856	879	896	910	929	948	964	977	986	991
35	324	400	471	536	593	646	698	755	810	861	904	942	976	1010	1039	1062	1071	1073	1072
40	300	379	456	530	607	678	742	782	818	854	917	977	1028	1040	1039	1030	1027	1023	1021
45	295	380	458	528	584	636	689	763	833	893	919	931	932	929	921	910	900	891	886
50	266	338	409	478	549	617	680	741	791	828	833	826	812	804	795	787	779	773	770
55	232	275	329	394	486	577	656	686	699	700	704	704	701	699	696	691	680	669	662
60	196	241	292	349	422	493	554	582	595	599	596	588	580	578	578	578	577	576	576
65	160	208	256	303	355	402	442	462	473	476	474	467	458	449	440	431	423	417	414
70	132	157	186	217	259	299	331	338	336	329	321	312	305	307	310	315	315	315	315
75	95.4	106	120	136	161	184	203	202	197	191	196	203	210	215	219	221	221	221	220
80	73.0	74.2	77.4	82.5	91.8	101	110	112	111	110	108	106	104	103	102	101	101	102	102
85	29.9	32.2	35.2	38.9	44.0	49.3	54.4	57.7	60.5	62.9	65.1	67.3	69.8	73.5	77.4	81.2	84.8	87.6	89.1
90	7.14	10.7	14.1	17.4	20.7	23.9	26.8	28.4	30.7	34.5	43.5	53.8	64.3	72.9	80.1	85.8	88.2	89.1	89.1
95	4.68	6.70	8.83	11.1	13.1	15.4	18.4	23.2	28.4	33.8	38.7	43.0	46.3	47.4	47.5	47.2	46.9	46.5	46.2
100	6.05	5.84	5.93	6.30	6.29	7.06	9.12	15.2	21.8	28.0	29.9	30.7	31.1	32.9	34.8	36.4	37.5	38.1	38.3
105	4.33	3.68	3.76	4.57	6.77	9.19	11.3	11.7	11.5	11.1	11.0	10.9	10.9	11.1	11.5	11.9	12.2	12.3	12.4
110	3.32	2.64	3.17	4.91	9.38	13.9	17.4	15.5	12.6	9.96	11.5	13.7	15.8	15.9	15.3	14.5	13.9	13.4	13.2
115	3.77	2.42	2.30	3.39	6.66	10.4	14.0	15.9	16.7	16.2	12.7	8.81	5.33	5.17	5.96	7.26	8.18	8.98	9.50
120	2.75	1.36	1.13	2.09	4.98	8.47	12.0	14.3	16.0	17.1	17.6	17.6	17.1	15.7	14.1	12.5	11.4	10.8	10.7
125	1.97	0.83	0.66	1.47	3.79	6.69	9.76	12.2	14.2	16.0	17.1	17.8	18.2	18.3	18.2	17.9	17.7	17.5	17.4
130	1.44	0.41	0.22	0.87	2.76	5.17	7.80	10.0	12.1	14.0	15.6	16.9	17.8	18.1	18.0	17.8	17.7	17.6	17.5
135	0.30	0.10	0.35	1.05	2.34	3.98	5.84	7.78	9.76	11.7	13.4	15.0	16.3	17.1	17.7	18.1	18.4	18.6	18.6
140	0.26	0.71	1.24	1.85	2.50	3.26	4.16	5.35	6.66	8.04	9.48	10.9	12.1	13.0	13.7	14.3	15.2	16.0	16.4
145	0.26	0.49	0.79	1.16	1.56	2.06	2.67	3.47	4.39	5.40	6.54	7.66	8.69	9.43	10.0	10.5	10.9	11.2	11.3
150	0.27	0.50	0.63	0.67	0.39	0.19	0.22	1.13	2.25	3.36	3.92	4.37	4.78	5.41	6.03	6.58	6.97	7.22	7.31
155	0.29	0.24	0.25	0.32	0.46	0.64	0.86	1.06	1.29	1.58	2.02	2.49	2.94	3.26	3.51	3.70	3.81	3.87	3.88
160	0.32	0.32	0.32	0.32	0.35	0.37	0.39	0.31	0.25	0.27	0.55	0.90	1.27	1.57	1.83	2.03	2.12	2.15	2.15
165	0.35	0.36	0.36	0.36	0.35	0.34	0.34	0.36	0.39	0.44	0.54	0.63	0.68	0.57	0.42	0.28	0.26	0.26	0.28
170	0.38	0.39	0.39	0.39	0.39	0.39	0.39	0.38	0.37	0.36	0.36	0.35	0.34	0.34	0.35	0.35	0.36	0.36	0.37
175	0.40	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.40	0.40	0.39	0.38	0.38	0.37	0.36	0.36	0.35	0.35	0.35
180	0.45	0.45	0.45	0.45	0.44	0.44	0.43	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.39	0.38	0.37	0.36	0.35

C (DEG) γ (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	478	478	478	479	480	481	482	483	483	484	485	486	487	487	488	488	489	489	485
5	572	560	544	521	499	484	495	509	521	506	487	469	467	470	475	477	478	479	447
10	686	670	656	661	667	668	646	618	590	575	562	547	518	490	466	456	456	464	433
15	748	741	732	721	712	704	707	707	700	665	622	577	544	514	488	466	448	435	419
20	862	846	828	810	792	775	765	754	740	719	693	661	618	571	524	485	449	415	420
25	934	923	911	903	892	877	850	818	783	751	716	674	615	553	493	447	408	375	378
30	986	977	964	948	929	910	896	879	856	819	774	721	654	584	514	455	401	352	373
35	1073	1071	1062	1039	1010	976	942	904	861	810	755	698	646	593	536	471	400	324	332
40	1023	1027	1030	1039	1040	1028	977	917	854	818	782	742	678	607	530	456	379	300	288
45	891	900	910	921	929	932	931	919	893	833	763	689	636	584	528	458	380	295	258
50	773	779	787	795	804	812	826	833	828	791	741	680	617	549	478	409	338	266	205
55	669	680	691	696	699	701	704	704	700	699	686	656	577	486	394	329	275	232	171
60	576	577	578	578	578	580	588	596	599	595	582	554	493	422	349	292	241	196	142
65	417	423	431	440	449	458	467	474	476	473	462	442	402	355	303	256	208	160	116
70	315	315	315	310	307	305	312	321	329	336	338	331	299	259	217	186	157	132	96.7
75	221	221	221	219	215	210	203	196	191	197	202	203	184	161	136	120	106	95.4	69.7
80	102	101	101	102	103	104	106	108	110	111	112	110	101	91.8	82.5	77.4	74.2	73.0	49.7
85	87.6	84.8	81.2	77.4	73.5	69.8	67.3	65.1	62.9	60.5	57.7	54.4	49.3	44.0	38.9	35.2	32.2	29.9	21.0
90	89.1	88.2	85.8	80.1	72.9	64.3	53.8	43.5	34.5	30.7	28.4	26.8	23.9	20.7	17.4	14.1	10.7	7.14	6.10
95	46.5	46.9	47.2	47.5	47.4	46.3	43.0	38.7	33.8	28.4	23.2	18.4	15.4	13.1	11.1	8.83	6.70	4.68	4.10
100	38.1	37.5	36.4	34.8	32.9	31.1	30.7	29.9	28.0	21.8	15.2	9.12	7.06	6.29	6.30	5.93	5.84	6.05	4.69
105	12.3	12.2	11.9	11.5	11.1	10.9	10.9	11.0	11.1	11.5	11.7	11.3	9.19	6.77	4.57	3.76	3.68	4.33	3.22
110	13.4	13.9	14.5	15.3	15.9	15.8	13.7	11.5	9.96	12.6	15.5	17.4	13.9	9.38	4.91	3.17	2.64	3.32	2.27
115	8.98	8.18	7.26	5.96	5.17	5.33	8.81	12.7	16.2	16.7	15.9	14.0	10.4	6.66	3.39	2.30	2.42	3.77	2.56
120	10.8	11.4	12.5	14.1	15.7	17.1	17.6	17.6	17.1	16.0	14.3	12.0	8.47	4.98	2.09	1.13	1.36	2.75	1.97
125	17.5	17.7	17.9	18.2	18.3	18.2	17.8	17.1	16.0	14.2	12.2	9.76	6.69	3.79	1.47	0.66	0.83	1.97	1.53
130	17.6	17.7	17.8	18.0	18.1	17.8	16.9	15.6	14.0	12.1	10.0	7.80	5.17	2.76	0.87	0.22	0.41	1.44	1.21
135	18.6	18.4	18.1	17.7	17.1	16.3	15.0	13.4	11.7	9.76	7.78	5.84	3.98	2.34	1.05	0.35	0.10	0.30	0.41
140	16.0	15.2	14.3	13.7	13.0	12.1	10.9	9.48	8.04	6.66	5.35	4.16	3.26	2.50	1.85	1.24	0.71	0.26	0.46
145	11.2	10.9	10.5	10.0	9.43	8.69	7.66	6.54	5.40	4.39	3.47	2.67	2.06	1.56	1.16	0.79	0.49	0.26	0.42
150	7.22	6.97	6.58	6.03	5.41	4.78	4.37	3.92	3.36	2.25	1.13	0.22	0.19	0.39	0.67	0.63	0.50	0.27	0.33
155	3.87	3.81	3.70	3.51	3.26	2.94	2.49	2.02	1.58	1.29	1.06	0.86	0.64	0.46	0.32	0.25	0.24	0.29	0.41
160	2.15	2.12	2.03	1.83	1.57	1.27	0.90	0.55	0.27	0.25	0.31	0.39	0.37	0.35	0.32	0.32	0.32	0.32	0.41
165	0.26	0.26	0.28	0.42	0.57	0.68	0.63	0.54	0.44	0.39	0.36	0.34	0.34	0.34	0.35	0.36	0.36	0.35	0.41
170	0.36	0.36	0.35	0.35	0.34	0.34	0.35	0.36	0.36	0.37	0.38	0.39	0.39	0.39	0.39	0.39	0.39	0.38	0.40
175	0.35	0.35	0.36	0.36	0.37	0.38	0.38	0.39	0.40	0.40	0.40	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41
180	0.36	0.37	0.38	0.39	0.40	0.41	0.41	0.42	0.42	0.43	0.43	0.43	0.44	0.44	0.45	0.45	0.45	0.45	0.40



Table--3

UNIT: \*10cd

C (DEG) y (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	482	480	479	479	479	478	478	477	477	476	476	477	478	479	479	478	478	478	479
5	422	405	400	400	401	398	394	390	389	388	388	385	384	384	391	400	406	400	391
10	409	394	393	395	398	391	382	373	367	363	359	356	353	352	356	360	363	360	356
15	406	395	390	385	379	363	345	325	304	284	266	250	238	228	221	218	217	218	221
20	417	407	388	363	333	300	264	230	200	174	153	139	130	125	121	120	120	120	121
25	372	358	332	300	262	217	173	135	118	110	107	103	101	100	99.5	99.3	99.5	99.3	99.5
30	375	356	302	239	177	143	120	106	98.5	95.5	94.4	88.7	83.2	78.2	75.2	73.3	72.7	73.3	75.2
35	323	296	238	174	116	100	95.2	95.4	84.7	73.8	63.4	55.7	49.5	44.7	41.6	39.8	39.3	39.8	41.6
40	267	238	193	146	103	85.2	74.5	67.7	55.8	45.0	35.9	30.8	27.5	25.6	24.3	23.8	23.9	23.8	24.3
45	222	187	150	116	86.4	67.4	53.7	43.8	35.1	28.8	24.9	23.9	24.2	25.1	24.2	23.4	22.8	23.4	24.2
50	156	118	96.2	81.7	71.2	55.4	41.4	30.0	25.6	23.6	22.8	19.6	16.6	13.9	12.4	11.6	11.3	11.6	12.4
55	123	86.3	67.1	56.3	50.4	40.2	31.4	23.9	18.7	14.9	12.2	10.5	9.48	8.96	8.51	8.30	8.29	8.30	8.51
60	98.2	65.8	48.7	39.3	34.5	26.8	20.4	15.3	11.6	8.98	7.24	6.21	5.71	5.55	5.38	5.33	5.36	5.33	5.38
65	80.4	53.3	37.4	27.8	22.2	16.0	11.3	7.88	5.14	3.17	1.83	0.92	0.40	0.16	0.06	0.07	0.15	0.07	0.06
70	67.9	45.2	30.3	20.3	13.8	8.35	4.77	2.58	1.10	0.37	0.14	0.01	0.07	0.21	0.21	0.20	0.20	0.20	0.21
75	48.4	31.4	19.8	11.7	6.57	3.40	1.84	1.31	0.62	0.27	0.18	0.13	0.17	0.24	0.26	0.26	0.26	0.26	0.26
80	31.0	17.1	9.45	5.36	3.64	1.98	1.19	0.94	0.54	0.31	0.21	0.18	0.22	0.28	0.30	0.31	0.32	0.31	0.30
85	13.9	8.40	5.14	3.19	2.16	1.34	0.90	0.72	0.48	0.33	0.26	0.25	0.27	0.32	0.35	0.37	0.38	0.37	0.35
90	5.11	4.16	3.20	2.33	1.59	1.14	0.83	0.64	0.48	0.38	0.33	0.32	0.34	0.37	0.40	0.42	0.43	0.42	0.40
95	3.52	2.96	2.37	1.82	1.34	1.03	0.79	0.63	0.52	0.46	0.43	0.42	0.42	0.44	0.47	0.49	0.51	0.49	0.47
100	3.55	2.63	1.98	1.51	1.18	0.93	0.77	0.66	0.58	0.53	0.50	0.49	0.50	0.52	0.55	0.58	0.61	0.58	0.55
105	2.31	1.57	1.05	0.70	0.49	0.45	0.49	0.58	0.61	0.63	0.65	0.65	0.64	0.64	0.67	0.70	0.72	0.70	0.67
110	1.48	0.95	0.82	0.84	0.93	0.79	0.65	0.52	0.50	0.51	0.54	0.57	0.60	0.63	0.66	0.69	0.70	0.69	0.66
115	1.63	0.99	0.76	0.72	0.78	0.68	0.59	0.52	0.52	0.53	0.55	0.56	0.57	0.57	0.58	0.58	0.58	0.58	0.58
120	1.36	0.92	0.73	0.65	0.64	0.57	0.52	0.49	0.50	0.52	0.55	0.56	0.57	0.57	0.58	0.58	0.58	0.58	0.58
125	1.18	0.90	0.73	0.63	0.57	0.51	0.48	0.48	0.50	0.53	0.56	0.58	0.59	0.60	0.61	0.61	0.61	0.61	0.61
130	1.01	0.84	0.70	0.59	0.52	0.49	0.48	0.49	0.51	0.53	0.56	0.59	0.62	0.64	0.66	0.66	0.66	0.66	0.66
135	0.50	0.55	0.55	0.53	0.50	0.50	0.51	0.52	0.54	0.57	0.60	0.63	0.65	0.66	0.67	0.68	0.68	0.68	0.67
140	0.60	0.68	0.65	0.58	0.50	0.50	0.51	0.54	0.55	0.58	0.60	0.63	0.67	0.69	0.70	0.71	0.71	0.71	0.70
145	0.53	0.59	0.59	0.56	0.52	0.53	0.54	0.56	0.58	0.60	0.62	0.65	0.68	0.71	0.71	0.71	0.71	0.71	0.71
150	0.48	0.54	0.55	0.54	0.53	0.55	0.57	0.59	0.60	0.61	0.63	0.65	0.68	0.69	0.69	0.69	0.69	0.68	0.69
155	0.51	0.57	0.59	0.60	0.59	0.58	0.58	0.58	0.59	0.60	0.62	0.64	0.65	0.66	0.65	0.64	0.63	0.64	0.65
160	0.56	0.63	0.65	0.64	0.63	0.62	0.61	0.60	0.60	0.61	0.62	0.61	0.61	0.60	0.59	0.59	0.59	0.59	0.59
165	0.58	0.64	0.65	0.65	0.62	0.62	0.61	0.60	0.59	0.57	0.56	0.54	0.52	0.51	0.51	0.51	0.52	0.51	0.51
170	0.56	0.60	0.61	0.59	0.56	0.54	0.51	0.48	0.47	0.46	0.46	0.45	0.44	0.43	0.43	0.42	0.42	0.42	0.43
175	0.53	0.56	0.56	0.54	0.52	0.48	0.45	0.42	0.42	0.42	0.42	0.41	0.39	0.38	0.38	0.39	0.40	0.39	0.38
180	0.44	0.44	0.44	0.44	0.44	0.43	0.42	0.41	0.40	0.39	0.38	0.38	0.38	0.38	0.38	0.38	0.39	0.38	0.38

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	479	478	477	476	476	477	477	478	478	479	479	479	480	482	485				
5	384	384	385	388	388	389	390	394	398	401	400	400	405	422	447				
10	352	353	356	359	363	367	373	382	391	398	395	393	394	409	433				
15	228	238	250	266	284	304	325	345	363	379	385	390	395	406	419				
20	125	130	139	153	174	200	230	264	300	333	363	388	407	417	420				
25	100	101	103	107	110	118	135	173	217	262	300	332	358	372	378				
30	78.2	83.2	88.7	94.4	95.5	98.5	106	120	143	177	239	302	356	375	373				
35	44.7	49.5	55.7	63.4	73.8	84.7	95.4	95.2	100	116	174	238	296	323	332				
40	25.6	27.5	30.8	35.9	45.0	55.8	67.7	74.5	85.2	103	146	193	238	267	288				
45	25.1	24.2	23.9	24.9	28.8	35.1	43.8	53.7	67.4	86.4	116	150	187	222	258				
50	13.9	16.6	19.6	22.8	23.6	25.6	30.0	41.4	55.4	71.2	81.7	96.2	118	156	205				
55	8.96	9.48	10.5	12.2	14.9	18.7	23.9	31.4	40.2	50.4	56.3	67.1	86.3	123	171				
60	5.55	5.71	6.21	7.24	8.98	11.6	15.3	20.4	26.8	34.5	39.3	48.7	65.8	98.2	142				
65	0.16	0.40	0.92	1.83	3.17	5.14	7.88	11.3	16.0	22.2	27.8	37.4	53.3	80.4	116				
70	0.21	0.07	0.01	0.14	0.37	1.10	2.58	4.77	8.35	13.8	20.3	30.3	45.2	67.9	96.7				
75	0.24	0.17	0.13	0.18	0.27	0.62	1.31	1.84	3.40	6.57	11.7	19.8	31.4	48.4	69.7				
80	0.28	0.22	0.18	0.21	0.31	0.54	0.94	1.19	1.98	3.64	5.36	9.45	17.1	31.0	49.7				
85	0.32	0.27	0.25	0.26	0.33	0.48	0.72	0.90	1.34	2.16	3.19	5.14	8.40	13.9	21.0				
90	0.37	0.34	0.32	0.33	0.38	0.48	0.64	0.83	1.14	1.59	2.33	3.20	4.16	5.11	6.10				
95	0.44	0.42	0.42	0.43	0.46	0.52	0.63	0.79	1.03	1.34	1.82	2.37	2.96	3.52	4.10				
100	0.52	0.50	0.49	0.50	0.53	0.58	0.66	0.77	0.93	1.18	1.51	1.98	2.63	3.55	4.69				
105	0.64	0.64	0.65	0.65	0.63	0.61	0.58	0.49	0.45	0.49	0.70	1.05	1.57	2.31	3.22				
110	0.63	0.60	0.57	0.54	0.51	0.50	0.52	0.65	0.79	0.93	0.84	0.82	0.95	1.48	2.27				
115	0.57	0.57	0.56	0.55	0.53	0.52	0.52	0.59	0.68	0.78	0.72	0.76	0.99	1.63	2.56				
120	0.57	0.57	0.56	0.55	0.52	0.50	0.49	0.52	0.57	0.64	0.65	0.73	0.92	1.36	1.97				
125	0.60	0.59	0.58	0.56	0.53	0.50	0.48	0.48	0.51	0.57	0.63	0.73	0.90	1.18	1.53				
130	0.64	0.62	0.59	0.56	0.53	0.51	0.49	0.48	0.49	0.52	0.59	0.70	0.84	1.01	1.21				
135	0.66	0.65	0.63	0.60	0.57	0.54	0.52	0.51	0.50	0.50	0.53	0.55	0.55	0.50	0.41				
140	0.69	0.67	0.63	0.60	0.58	0.55	0.54	0.51	0.50	0.50	0.58	0.65	0.68	0.60	0.46				
145	0.71	0.68	0.65	0.62	0.60	0.58	0.56	0.54	0.53	0.52	0.56	0.59	0.59	0.53	0.42				
150	0.69	0.68	0.65	0.63	0.61	0.60	0.59	0.57	0.55	0.53	0.54	0.55	0.54	0.48	0.39				
155	0.66	0.65	0.64	0.62	0.60	0.59	0.58	0.58	0.58	0.59	0.60	0.59	0.57	0.51	0.42				
160	0.60	0.61	0.61	0.62	0.61	0.60	0.60	0.61	0.62	0.63	0.64	0.65	0.63	0.56	0.46				
165	0.51	0.52	0.54	0.56	0.57	0.59	0.60	0.61	0.62	0.62	0.65	0.65	0.64	0.58	0.48				
170	0.43	0.44	0.45	0.46	0.46	0.47	0.48	0.51	0.54	0.56	0.59	0.61	0.60	0.56	0.48				
175	0.38	0.39	0.41	0.42	0.42	0.42	0.42	0.45	0.48	0.52	0.54	0.56	0.56	0.53	0.47				
180	0.38	0.38	0.38	0.38	0.39	0.40	0.41	0.42	0.43	0.44	0.44	0.44	0.44	0.44	0.44				

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

<b>Model No.</b>	WPX3 @ 130W / 3000K	<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	1.096	131.2	0.998	4.11
277.0	60	0.479	127.5	0.961	6.54



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