

## Photometric Test Report

### Relevant Standards

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

Prepared For

**RAB Lighting Inc.**

Prepared By

**Dongguan New Testing Centre Co., Ltd.**

Prepare by:

*Alan Wang*

Engineer: Alan Wang

Date: 2023-10-30

Review by:

*Vincent Yuan*

Technical Lead: Vincent Yuan

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Revised Date: N/A

## 1.0 Test Summary

DLC Technical Requirements V5.1

Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		14816
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		145.7
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		14425
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	141.8
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		101.7
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	480V	14.71
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	480V	0.873
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5206
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		84.9
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		14
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		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%		2.1%
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		0.243
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		101.7
(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	2023-10-23	WPX3 @ 100W / 5000K 480	231020002-S1
2	Goniophotometer Test	2023-10-23	WPX3 @ 100W / 5000K 480	231020002-S1
3	THD and PF Test	2023-10-23	WPX3 @ 100W / 5000K 480	231020002-S1

### Remark (If any)

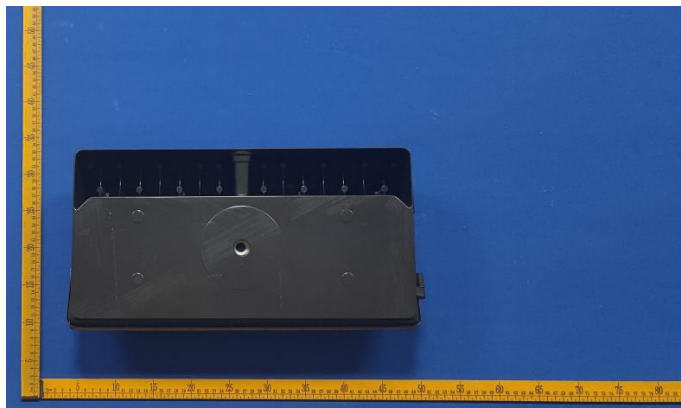
1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

## 3.0 Product Description

Luminaire Description: Model No. WPX3 @ 100W / 5000K 480, color tunable from 3000K, 4000K and 5000K.

Electrical Specification: 480Vac, 50/60Hz

### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

<b>Model No.</b>	WPX3 @ 100W / 5000K 480	<b>Sample ID</b>	231020002-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

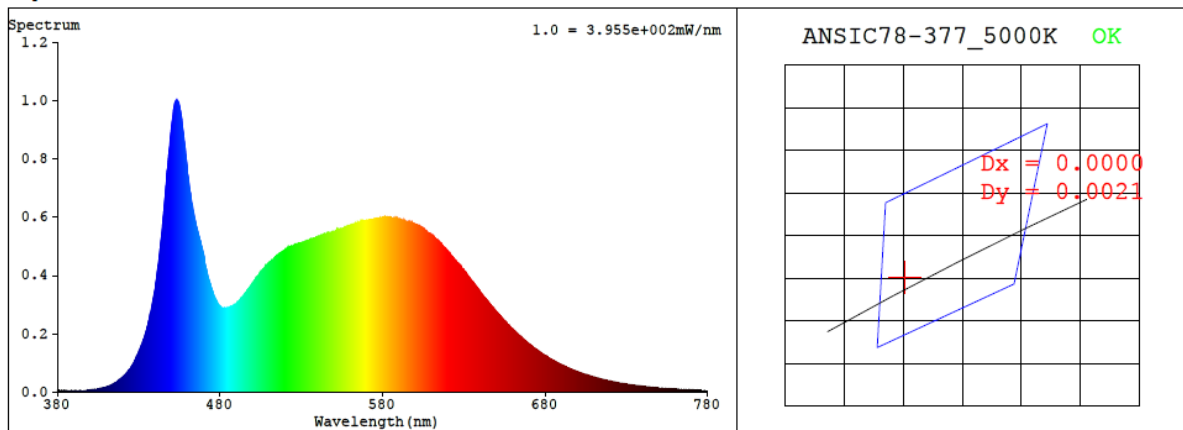
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at <math>25 \pm 1^\circ\text{C}</math>.</p> <p>The sample 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 <math>\pm 0.2</math> percent under load.</p> <p>The sample was measured using <math>4\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
480.0	60	0.243	101.7	0.873

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5206	84.9	14	0.0010	85	95	-12%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3396$   $y = 0.3492$  /  $u' = 0.2086$   $v' = 0.4827$  ( $duv=1.04e-03$ )

CCT= 5206K Prcp WL: Ld=567.7nm Purity=6.7%

Peak WL: Lp=453nm FWHM: =25.2nm Ratio:R=15.6% G=79.3% B=5.1%

Render Index: Ra = 84.9 AvgR = 78.8 TM30:Rf=84 Rg=95

EEL: 0.09533 A++ Highest

R1 =84	R2 =91	R3 =94	R4 =84	R5 =84	R6 =87	R7 =87
R8 =69	R9 =14	R10=78	R11=83	R12=65	R13=86	R14=97 R15=79

## 4.1 Integrating Sphere Test

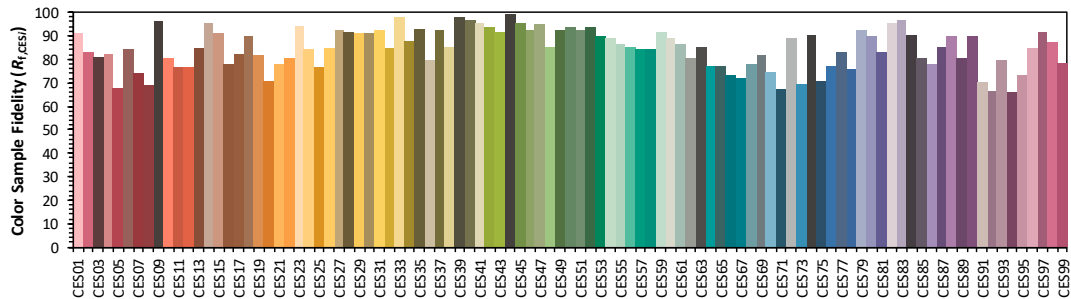
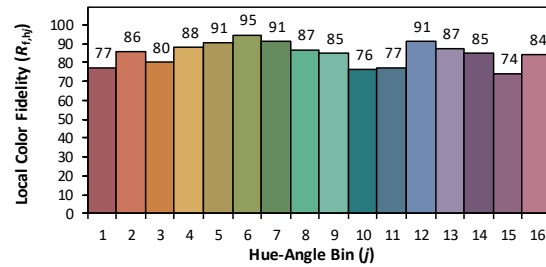
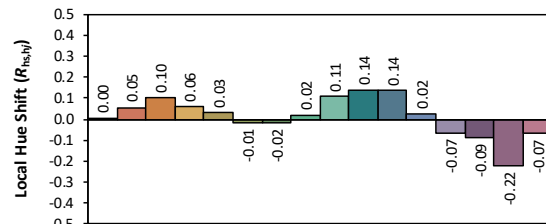
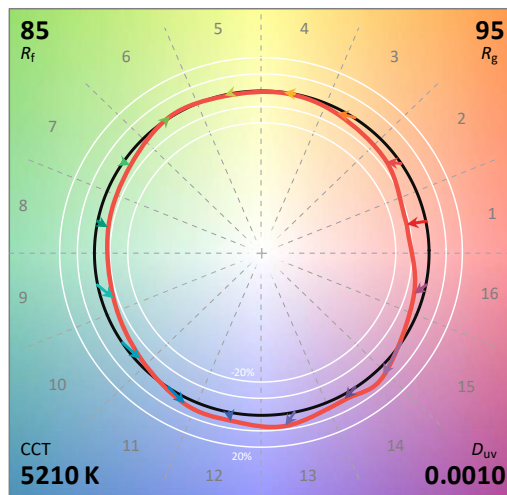
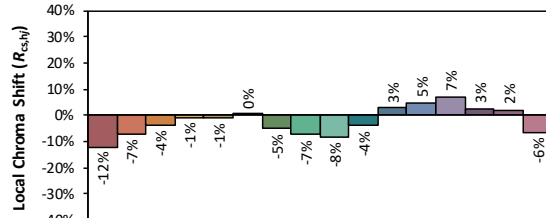
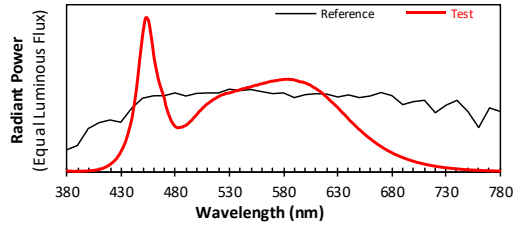
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/10/30

Model: WPX3 @ 100W / 5000K 480



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

$x$  0.3396  
 $y$  0.3490  
 $u'$  0.2087  
 $v'$  0.4826

CIE 13.3-1995  
(CRI)

$R_a$  85  
 $R_g$  15

## 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	7.30E-06	447	7.28E-04	514	4.64E-04	581	5.99E-04	648	2.90E-04	715	4.38E-05
381	5.20E-06	448	7.85E-04	515	4.67E-04	582	5.99E-04	649	2.81E-04	716	4.26E-05
382	5.40E-06	449	8.46E-04	516	4.72E-04	583	5.99E-04	650	2.76E-04	717	4.12E-05
383	4.60E-06	450	9.03E-04	517	4.76E-04	584	6.00E-04	651	2.70E-04	718	4.00E-05
384	5.70E-06	451	9.46E-04	518	4.80E-04	585	6.00E-04	652	2.63E-04	719	3.89E-05
385	4.40E-06	452	9.88E-04	519	4.85E-04	586	5.97E-04	653	2.57E-04	720	3.78E-05
386	3.90E-06	453	9.99E-04	520	4.88E-04	587	5.98E-04	654	2.51E-04	721	3.66E-05
387	4.10E-06	454	9.94E-04	521	4.92E-04	588	5.98E-04	655	2.44E-04	722	3.52E-05
388	4.40E-06	455	9.81E-04	522	4.96E-04	589	5.97E-04	656	2.39E-04	723	3.42E-05
389	5.00E-06	456	9.50E-04	523	4.98E-04	590	5.95E-04	657	2.32E-04	724	3.32E-05
390	4.90E-06	457	9.05E-04	524	5.01E-04	591	5.93E-04	658	2.28E-04	725	3.21E-05
391	4.50E-06	458	8.59E-04	525	5.02E-04	592	5.91E-04	659	2.21E-04	726	3.10E-05
392	4.60E-06	459	8.09E-04	526	5.07E-04	593	5.90E-04	660	2.16E-04	727	3.04E-05
393	5.00E-06	460	7.53E-04	527	5.07E-04	594	5.86E-04	661	2.11E-04	728	2.92E-05
394	5.60E-06	461	7.11E-04	528	5.10E-04	595	5.84E-04	662	2.05E-04	729	2.85E-05
395	5.40E-06	462	6.73E-04	529	5.11E-04	596	5.83E-04	663	2.00E-04	730	2.76E-05
396	5.30E-06	463	6.41E-04	530	5.11E-04	597	5.81E-04	664	1.94E-04	731	2.66E-05
397	5.80E-06	464	6.07E-04	531	5.13E-04	598	5.82E-04	665	1.90E-04	732	2.61E-05
398	6.20E-06	465	5.81E-04	532	5.16E-04	599	5.78E-04	666	1.85E-04	733	2.54E-05
399	6.60E-06	466	5.56E-04	533	5.17E-04	600	5.76E-04	667	1.80E-04	734	2.43E-05
400	7.40E-06	467	5.34E-04	534	5.20E-04	601	5.74E-04	668	1.75E-04	735	2.36E-05
401	8.00E-06	468	5.14E-04	535	5.23E-04	602	5.70E-04	669	1.70E-04	736	2.26E-05
402	8.50E-06	469	4.92E-04	536	5.25E-04	603	5.66E-04	670	1.66E-04	737	2.20E-05
403	9.30E-06	470	4.70E-04	537	5.26E-04	604	5.65E-04	671	1.62E-04	738	2.14E-05
404	9.70E-06	471	4.33E-04	538	5.27E-04	605	5.61E-04	672	1.57E-04	739	2.09E-05
405	1.08E-05	472	4.12E-04	539	5.30E-04	606	5.56E-04	673	1.52E-04	740	2.00E-05
406	1.19E-05	473	3.86E-04	540	5.33E-04	607	5.51E-04	674	1.48E-04	741	1.94E-05
407	1.32E-05	474	3.69E-04	541	5.34E-04	608	5.46E-04	675	1.44E-04	742	1.88E-05
408	1.40E-05	475	3.51E-04	542	5.38E-04	609	5.44E-04	676	1.40E-04	743	1.84E-05
409	1.54E-05	476	3.34E-04	543	5.39E-04	610	5.39E-04	677	1.36E-04	744	1.75E-05
410	1.75E-05	477	3.20E-04	544	5.39E-04	611	5.34E-04	678	1.33E-04	745	1.70E-05
411	1.97E-05	478	3.10E-04	545	5.42E-04	612	5.30E-04	679	1.29E-04	746	1.64E-05
412	2.14E-05	479	3.01E-04	546	5.46E-04	613	5.25E-04	680	1.25E-04	747	1.60E-05
413	2.43E-05	480	2.94E-04	547	5.46E-04	614	5.21E-04	681	1.22E-04	748	1.54E-05
414	2.70E-05	481	2.89E-04	548	5.47E-04	615	5.14E-04	682	1.18E-04	749	1.50E-05
415	3.06E-05	482	2.85E-04	549	5.49E-04	616	5.10E-04	683	1.15E-04	750	1.44E-05
416	3.28E-05	483	2.87E-04	550	5.51E-04	617	5.02E-04	684	1.12E-04	751	1.41E-05
417	3.72E-05	484	2.89E-04	551	5.53E-04	618	4.95E-04	685	1.09E-04	752	1.37E-05
418	4.09E-05	485	2.88E-04	552	5.56E-04	619	4.91E-04	686	1.06E-04	753	1.29E-05
419	4.55E-05	486	2.91E-04	553	5.58E-04	620	4.84E-04	687	1.02E-04	754	1.28E-05
420	5.04E-05	487	2.92E-04	554	5.60E-04	621	4.78E-04	688	9.96E-05	755	1.26E-05
421	5.61E-05	488	2.97E-04	555	5.61E-04	622	4.70E-04	689	9.69E-05	756	1.22E-05
422	6.17E-05	489	2.99E-04	556	5.62E-04	623	4.64E-04	690	9.38E-05	757	1.18E-05
423	6.80E-05	490	3.03E-04	557	5.66E-04	624	4.56E-04	691	9.14E-05	758	1.14E-05
424	7.50E-05	491	3.08E-04	558	5.67E-04	625	4.51E-04	692	8.92E-05	759	1.10E-05
425	8.21E-05	492	3.14E-04	559	5.70E-04	626	4.44E-04	693	8.61E-05	760	1.06E-05
426	9.11E-05	493	3.22E-04	560	5.69E-04	627	4.38E-04	694	8.34E-05	761	1.04E-05
427	1.02E-04	494	3.29E-04	561	5.72E-04	628	4.32E-04	695	8.10E-05	762	1.00E-05
428	1.11E-04	495	3.34E-04	562	5.76E-04	629	4.24E-04	696	7.87E-05	763	9.70E-06
429	1.23E-04	496	3.41E-04	563	5.75E-04	630	4.19E-04	697	7.62E-05	764	9.40E-06
430	1.37E-04	497	3.51E-04	564	5.78E-04	631	4.10E-04	698	7.41E-05	765	9.10E-06
431	1.50E-04	498	3.58E-04	565	5.80E-04	632	4.03E-04	699	7.18E-05	766	8.80E-06
432	1.64E-04	499	3.65E-04	566	5.82E-04	633	3.95E-04	700	6.96E-05	767	8.50E-06
433	1.81E-04	500	3.74E-04	567	5.84E-04	634	3.88E-04	701	6.75E-05	768	8.40E-06
434	1.99E-04	501	3.82E-04	568	5.86E-04	635	3.81E-04	702	6.56E-05	769	8.10E-06
435	2.21E-04	502	3.91E-04	569	5.87E-04	636	3.75E-04	703	6.31E-05	770	7.90E-06
436	2.42E-04	503	3.97E-04	570	5.88E-04	637	3.67E-04	704	6.15E-05	771	7.70E-06
437	2.71E-04	504	4.03E-04	571	5.88E-04	638	3.60E-04	705	6.00E-05	772	7.40E-06
438	2.94E-04	505	4.12E-04	572	5.90E-04	639	3.52E-04	706	5.84E-05	773	7.20E-06
439	3.23E-04	506	4.18E-04	573	5.91E-04	640	3.44E-04	707	5.64E-05	774	7.00E-06
440	3.54E-04	507	4.24E-04	574	5.91E-04	641	3.36E-04	708	5.47E-05	775	6.80E-06
441	3.97E-04	508	4.32E-04	575	5.93E-04	642	3.28E-04	709	5.32E-05	776	6.50E-06
442	4.38E-04	509	4.37E-04	576	5.95E-04	643	3.23E-04	710	5.16E-05	777	6.40E-06
443	4.88E-04	510	4.43E-04	577	5.95E-04	644	3.16E-04	711	4.99E-05	778	6.10E-06
444	5.38E-04	511	4.47E-04	578	5.97E-04	645	3.10E-04	712	4.82E-05	779	6.00E-06
445	5.97E-04	512	4.53E-04	579	5.97E-04	646	3.03E-04	713	4.66E-05	780	6.00E-06
446	6.61E-04	513	4.56E-04	580	5.99E-04	647	2.95E-04	714	4.55E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	WPX3 @ 100W / 5000K 480	<b>Sample ID</b>	231020002-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.0	<b>Humidity (%RH)</b>	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 <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>	480.0	60	0.243	101.7	0.873
<b>NON-WORST CASE</b>	N/A	N/A	N/A	N/A	N/A

#### Test Result

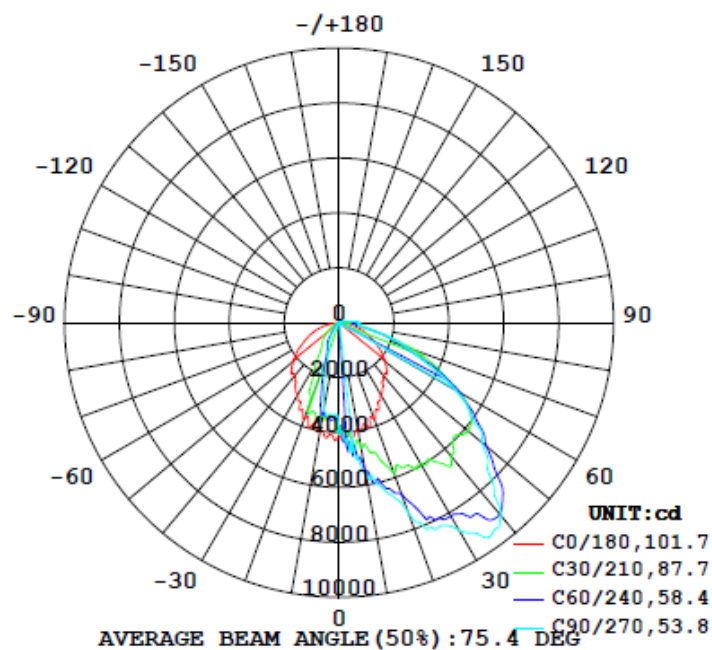
Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	BUG
		C0-180	C90-270	C0-180	C90-270		(80°-90°)	
<b>0°-180° zones</b>	14816	106.9	145.5	54.8	101.1	145.7	2.0%	B3-U3-G3
<b>0°-90° zones</b>	14425	106.9	145.5	54.8	101.1	141.8	2.1%	B3-U3-G3



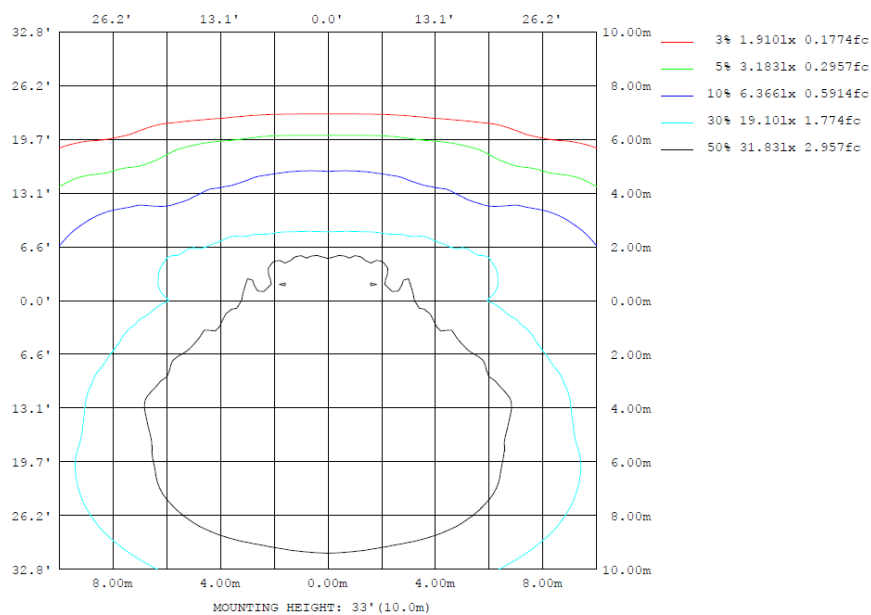
## 4.2 Goniophotometer Test

### Lighting Distribution Curve

**LUMINOUS INTENSITY DISTRIBUTION DIAGRAM**



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

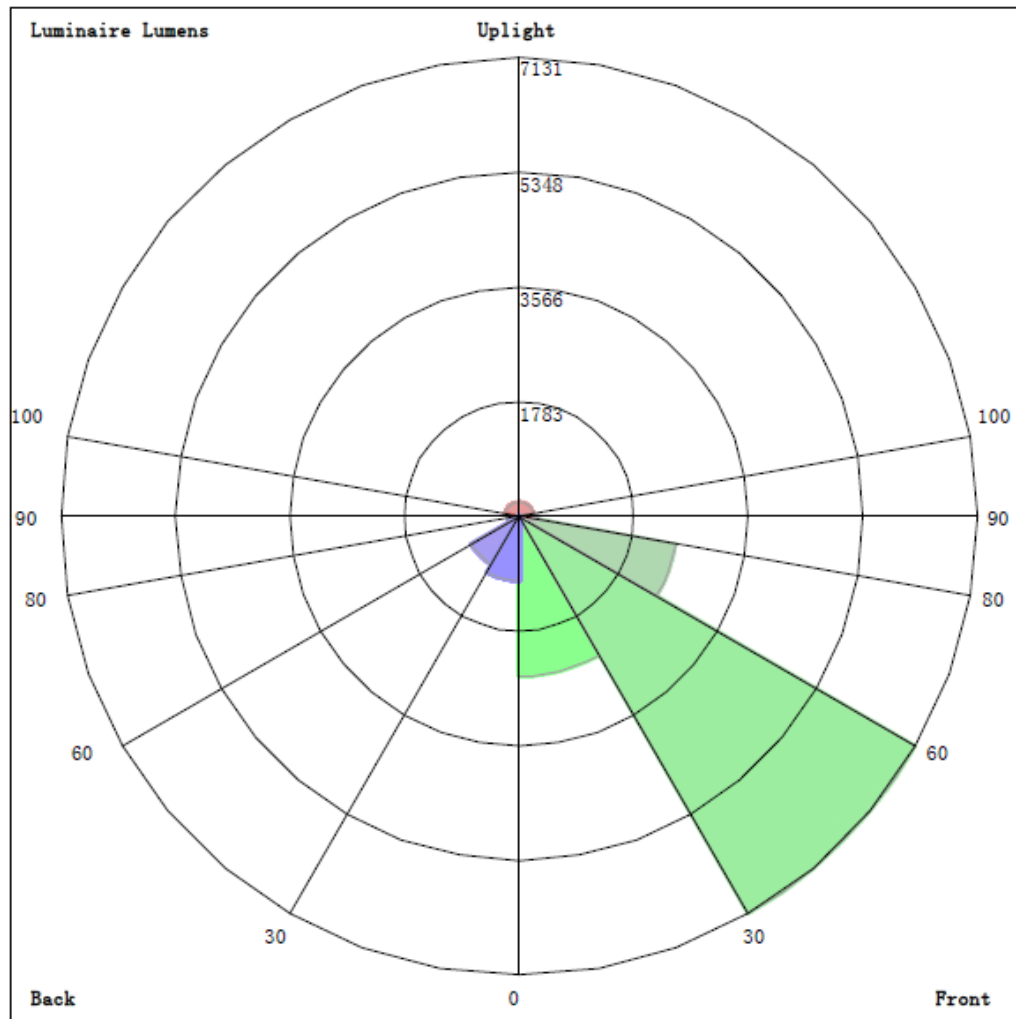
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	φ zone	φ total	%lum, lamp
10	3948	5138	5591	5138	3948	3545	3220	3545	0- 10	384.1	384.1	2.59,2.59
20	3747	6276	7352	6276	3747	2128	1118	2128	10- 20	1176	1560	10.5,10.5
30	3033	7570	8736	7570	3033	1011	625.5	1011	20- 30	1927	3488	23.5,23.5
40	2527	7595	9164	7595	2527	587.0	210.9	587.0	30- 40	2594	6082	41,41
50	2197	7324	6793	7324	2197	260.4	99.21	260.4	40- 50	2847	8929	60.3,60.3
60	1534	5254	4864	5254	1534	130.9	37.71	130.9	50- 60	2552	11482	77.5,77.5
70	985.1	2627	2591	2627	985.1	23.01	3.000	23.01	60- 70	1792	13274	89.6,89.6
80	411.6	839.7	845.7	839.7	411.6	8.941	3.889	8.941	70- 80	849.0	14123	95.3,95.3
90	37.27	320.1	745.1	320.1	37.27	6.627	5.170	6.627	80- 90	302.1	14425	97.4,97.4
100	38.36	236.7	319.4	236.7	38.36	6.996	6.135	6.996	90-100	171.8	14597	98.5,98.5
110	28.82	80.66	108.2	80.66	28.82	4.635	7.509	4.635	100-110	66.35	14663	99,99
120	23.52	148.9	89.09	148.9	23.52	4.309	5.072	4.309	110-120	45.17	14708	99.3,99.3
130	12.42	119.9	146.0	119.9	12.42	4.306	5.884	4.306	120-130	47.57	14756	99.6,99.6
140	2.744	70.64	139.9	70.64	2.744	4.626	6.215	4.626	130-140	35.47	14791	99.8,99.8
150	2.421	31.54	65.23	31.54	2.421	5.082	5.826	5.082	140-150	17.59	14809	100,100
160	2.829	2.293	20.51	2.293	2.829	5.235	5.071	5.235	150-160	5.447	14814	100,100
170	3.312	3.123	3.293	3.123	3.312	4.249	3.686	4.249	160-170	1.380	14816	100,100
180	3.843	3.688	3.308	3.688	3.843	3.646	3.367	3.646	170-180	0.3495	14816	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)	Total (lm)	Percent
0-10	384.06	2.59%
10-20	1176.00	10.53%
20-30	1927.46	23.54%
30-40	2594.13	41.05%
40-50	2847.43	60.27%
50-60	2552.42	77.50%
60-70	1792.16	89.59%
70-80	849.04	95.32%
80-90	302.09	97.36%
90-100	171.78	98.52%
100-110	66.35	98.97%
110-120	45.17	99.27%
120-130	47.57	99.60%
130-140	35.47	99.84%
140-150	17.59	99.95%
150-160	5.45	99.99%
160-170	1.38	100.00%
170-180	0.35	100.00%

## 4.2 Goniophotometer Test

LCS/BUG

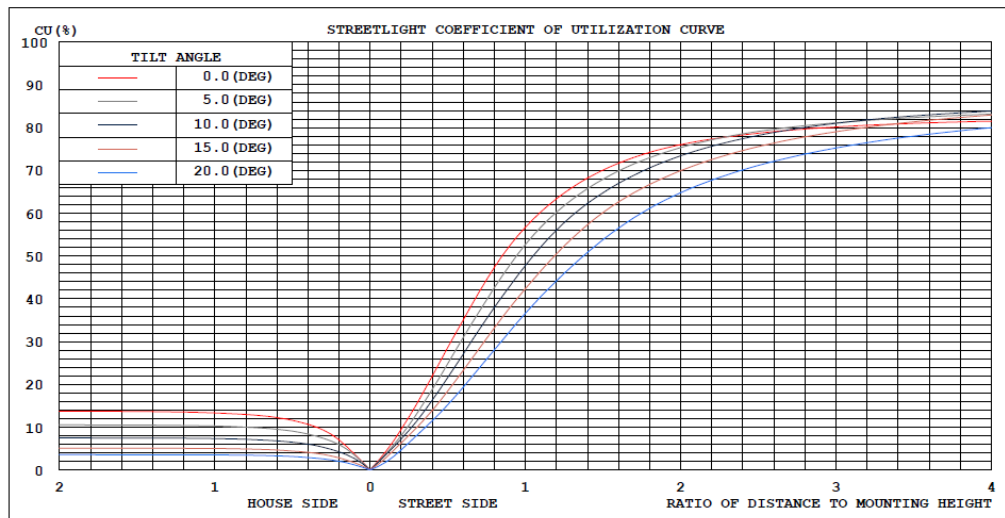


### LUMINAIRE CLASSIFICATION SYSTEM (LCS)

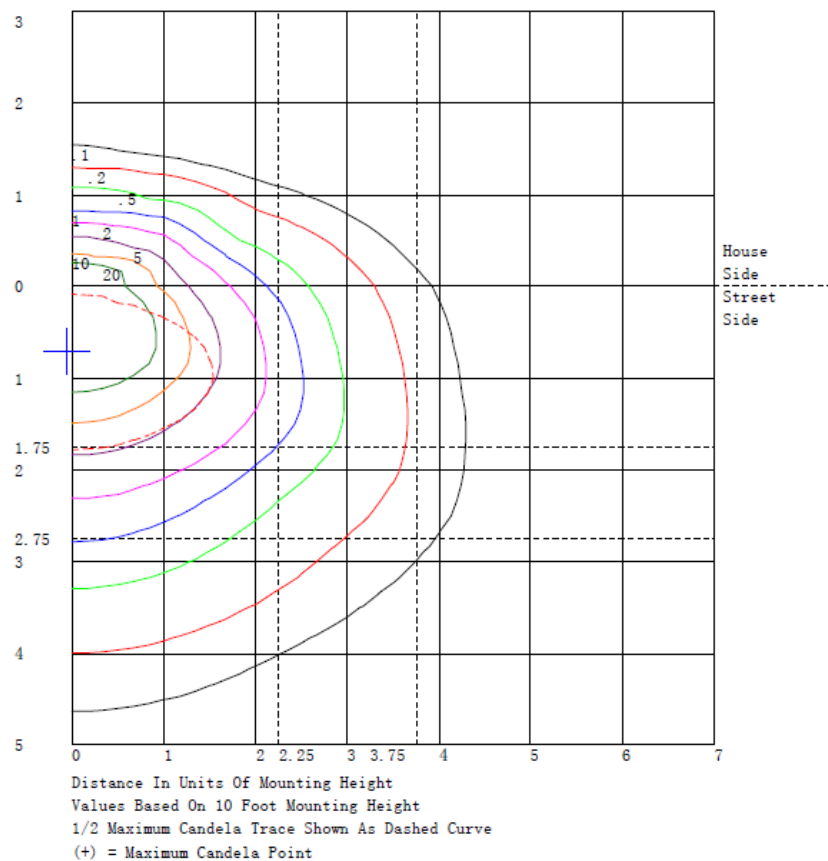
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	2485.3	N.A.	16.8
FM - Front-Medium (30-60)	7131.1	N.A.	48.1
FH - Front-High (60-80)	2474.8	N.A.	16.7
FVH - Front-Very High (80-90)	284.9	N.A.	1.9
BL - Back-Low (0-30)	1002.2	N.A.	6.8
BM - Back-Medium (30-60)	862.8	N.A.	5.8
BH - Back-High (60-80)	166.4	N.A.	1.1
BVH - Back-Very High (80-90)	17.2	N.A.	0.1
UL - Uplight-Low (90-100)	171.8	N.A.	1.2
UH - Uplight-High (100-180)	219.3	N.A.	1.5
Total	14815.8	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: cd

C (DEG) y	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	4067	4066	4065	4064	4063	4062	4061	4059	4057	4053	4046	4039	4033	4032	4033	4034	4032	4030	4029
5	4092	4045	4008	3981	3941	3929	3965	4160	4368	4540	4486	4395	4322	4436	4582	4722	4751	4749	4728
10	3948	3871	3870	3945	4138	4376	4627	4817	4987	5138	5270	5381	5469	5527	5564	5585	5592	5592	5591
15	3901	3909	3979	4109	4310	4563	4861	5243	5615	5932	6044	6090	6105	6180	6250	6305	6315	6307	6287
20	3747	3821	4005	4299	4806	5345	5839	6056	6189	6276	6400	6521	6646	6800	6954	7096	7221	7312	7352
25	3446	3727	4049	4413	4856	5313	5753	6083	6388	6690	7072	7444	7781	8021	8200	8319	8350	8341	8314
30	3033	3468	3921	4395	4891	5404	5931	6524	7085	7570	7838	8018	8141	8273	8383	8480	8596	8687	8736
35	2829	3429	4014	4586	5161	5709	6218	6633	7014	7378	7787	8184	8555	8882	9157	9370	9478	9527	9531
40	2527	3132	3749	4377	5054	5714	6327	6780	7191	7595	8156	8681	9108	9224	9229	9175	9162	9154	9164
45	2493	3192	3839	4434	4928	5408	5911	6623	7318	7919	8215	8363	8386	8284	8122	7939	7807	7713	7676
50	2197	2789	3409	4058	4795	5515	6173	6689	7079	7324	7294	7165	7002	6973	6961	6951	6885	6826	6793
55	1902	2422	3000	3636	4452	5235	5893	6138	6222	6202	6188	6141	6076	6025	5975	5928	5878	5842	5830
60	1534	2011	2522	3067	3736	4372	4909	5142	5245	5254	5227	5165	5090	5056	5025	4995	4937	4888	4864
65	1254	1696	2143	2595	3117	3595	3980	4113	4137	4084	4008	3905	3793	3710	3638	3578	3529	3499	3492
70	985	1232	1507	1810	2220	2598	2887	2878	2773	2627	2556	2502	2470	2486	2519	2558	2571	2581	2591
75	699	939	993	1161	1387	1593	1746	1718	1641	1552	1551	1565	1586	1587	1588	1588	1590	1596	1608
80	412	469	543	633	771	901	997	970	910	840	819	809	809	813	822	831	837	841	846
85	144	190	241	299	375	448	509	525	530	533	560	593	629	663	696	727	757	780	793
90	37.3	73.0	108	141	174	205	235	256	282	320	400	488	574	632	678	712	732	742	745
95	30.9	50.9	71.7	93.3	113	135	163	207	255	305	354	398	432	440	440	435	438	441	445
100	38.4	40.4	44.7	51.3	55.2	65.0	84.3	134	188	237	252	258	260	274	287	300	309	316	319
105	28.7	28.6	33.2	42.7	62.4	82.8	100	101	97.0	91.7	91.7	92.7	94.6	96.9	99.6	103	106	110	112
110	28.8	23.8	28.5	42.9	79.6	117	144	128	103	80.7	92.1	110	127	128	124	118	113	109	108
115	30.8	20.0	19.4	28.8	56.2	87.7	118	135	143	140	111	77.1	46.2	41.6	45.0	53.0	60.6	67.8	73.0
120	23.5	11.4	9.50	17.8	42.9	73.2	104	124	139	149	150	145	138	128	117	106	97.2	90.9	89.1
125	17.2	6.95	5.44	12.6	33.3	59.1	86.4	108	127	141	149	152	152	150	147	143	141	140	140
130	12.4	2.57	0.39	5.89	23.0	44.9	68.4	87.2	104	120	133	144	152	152	150	147	146	146	146
135	5.20	1.68	2.57	7.87	19.2	33.8	50.3	66.8	83.4	99.4	114	127	137	144	148	151	154	156	157
140	2.74	6.83	11.6	17.1	22.9	29.7	37.6	47.9	59.0	70.6	82.1	93.1	103	110	116	122	130	136	140
145	2.53	4.55	7.24	10.6	14.5	19.2	24.7	31.5	39.2	47.6	57.8	67.9	77.2	83.4	88.2	92.0	95.6	98.1	99.4
150	2.42	4.35	5.47	5.77	3.24	1.41	1.80	10.5	21.1	31.5	36.5	40.2	43.4	48.6	53.8	58.4	61.9	64.3	65.2
155	2.56	2.00	2.03	2.67	4.02	5.88	8.15	10.6	13.5	16.6	20.3	24.0	27.5	30.3	32.5	34.2	35.3	35.8	35.9
160	2.83	2.68	2.65	2.74	3.13	3.52	3.76	2.85	2.19	2.29	5.11	8.68	12.4	15.2	17.6	19.4	20.3	20.6	20.5
165	3.06	3.08	3.09	3.08	2.96	2.88	2.90	3.19	3.62	4.20	5.24	6.13	6.58	5.40	3.90	2.46	2.17	2.20	2.41
170	3.31	3.34	3.36	3.36	3.35	3.34	3.30	3.25	3.19	3.12	3.04	2.98	2.95	3.02	3.11	3.20	3.23	3.26	3.29
175	3.50	3.55	3.58	3.59	3.58	3.55	3.52	3.49	3.45	3.41	3.36	3.31	3.26	3.20	3.14	3.09	3.03	2.98	2.97
180	3.84	3.87	3.88	3.88	3.86	3.83	3.79	3.77	3.73	3.69	3.61	3.53	3.47	3.51	3.55	3.58	3.49	3.39	3.31

C (DEG)																			UNIT: cd	
y	(DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0		4030	4032	4034	4033	4032	4033	4039	4046	4053	4057	4059	4061	4062	4063	4064	4065	4066	4067	4050
5		4749	4751	4722	4582	4436	4322	4395	4486	4540	4368	4160	3965	3929	3941	3981	4008	4045	4092	3787
10		5592	5592	5585	5564	5527	5469	5381	5270	5138	4987	4817	4627	4376	4138	3945	3870	3871	3948	3639
15		6307	6315	6305	6250	6180	6105	6090	6044	5932	5615	5243	4861	4563	4310	4109	3979	3909	3901	3652
20		7312	7221	7096	6954	6800	6646	6521	6400	6276	6189	6056	5839	5345	4806	4299	4005	3821	3747	3611
25		8341	8350	8319	8200	8021	7781	7444	7072	6690	6388	6083	5753	5313	4856	4413	4049	3727	3446	3638
30		8687	8596	8480	8383	8273	8141	8018	7838	7570	7085	6524	5931	5404	4891	4395	3921	3468	3033	3226
35		9527	9478	9370	9157	8882	8555	8184	7787	7378	7014	6633	6218	5709	5161	4586	4014	3429	2829	3029
40		9154	9162	9175	9229	9224	9108	8681	8156	7595	7191	6780	6327	5714	5054	4377	3749	3132	2527	2506
45		7713	7807	7939	8122	8284	8386	8363	8215	7919	7318	6623	5911	5408	4928	4434	3839	3192	2493	2258
50		6826	6885	6951	6961	6973	7002	7165	7294	7324	7079	6689	6173	5515	4795	4058	3409	2789	2197	1776
55		5842	5878	5928	5975	6025	6076	6141	6188	6202	6222	6138	5893	5235	4452	3636	3000	2422	1902	1460
60		4888	4937	4995	5025	5056	5090	5165	5227	5254	5245	5142	4909	4372	3736	3067	2522	2011	1534	1141
65		3499	3529	3578	3638	3710	3793	3905	4008	4084	4137	4113	3980	3595	3117	2595	2143	1696	1254	925
70		2581	2571	2558	2519	2486	2470	2502	2556	2627	2773	2878	2887	2598	2220	1810	1507	1232	985	750
75		1596	1590	1588	1588	1587	1586	1565	1551	1552	1641	1718	1746	1593	1387	1161	993	839	699	527
80		841	837	831	822	813	809	809	819	840	910	970	997	901	771	633	543	469	412	303
85		780	757	727	696	663	629	593	560	533	530	525	509	448	375	299	241	190	144	117
90		742	732	712	678	632	574	488	400	320	282	256	235	205	174	141	108	73.0	37.3	38.4
95		441	438	435	440	440	432	398	354	305	255	207	163	135	113	93.3	71.7	50.9	30.9	28.8
100		316	309	300	287	274	260	258	252	237	188	134	84.3	65.0	55.2	51.3	44.7	40.4	38.4	31.5
105		110	106	103	99.6	96.9	94.6	92.7	91.7	91.7	97.0	101	100	82.8	62.4	42.7	33.2	28.6	28.7	23.8
110		109	113	118	124	128	127	110	92.1	80.7	103	128	144	117	79.6	42.9	28.5	23.8	28.8	20.7
115		67.8	60.6	53.0	45.0	41.6	46.2	77.1	111	140	143	135	118	87.7	56.2	28.8	19.4	20.0	30.8	22.7
120		90.9	97.2	106	117	128	138	145	150	149	139	124	104	73.2	42.9	17.8	9.50	11.4	23.5	18.1
125		140	141	143	147	150	152	152	149	141	127	108	86.4	59.1	33.3	12.6	5.44	6.95	17.2	14.1
130		146	146	147	150	152	152	144	133	120	104	87.2	68.4	44.9	23.0	5.89	0.39	2.57	12.4	10.8
135		156	154	151	148	144	137	127	114	99.4	83.4	66.8	50.3	33.8	19.2	7.87	2.57	1.68	5.20	5.01
140		136	130	122	116	110	103	93.1	82.1	70.6	59.0	47.9	37.6	29.7	22.9	17.1	11.6	6.93	2.74	4.30
145		98.1	95.6	92.0	88.2	83.4	77.2	67.9	57.8	47.6	39.2	31.5	24.7	19.2	14.5	10.6	7.24	4.55	2.53	3.77
150		64.3	61.9	58.4	53.8	48.6	43.4	40.2	36.5	31.5	21.1	10.5	1.80	1.41	3.24	5.77	5.47	4.35	2.42	3.44
155		35.8	35.3	32.4	32.5	30.3	27.5	24.0	20.3	16.6	13.5	10.6	8.15	5.88	4.02	2.67	2.03	2.00	2.56	3.65
160		20.6	20.3	19.4	17.6	15.2	12.4	8.68	5.11	2.29	2.19	2.85	3.76	3.52	3.13	2.74	2.65	2.68	2.83	4.04
165		2.20	2.17	2.46	3.90	6.40	6.58	6.13	5.24	4.20	3.62	3.19	2.90	2.88	2.96	2.38	3.09	3.08	3.06	4.44
170		3.26	3.23	3.20	3.11	3.02	2.95	2.98	3.04	3.12	3.19	3.25	3.30	3.34	3.35	3.36	3.36	3.34	3.31	4.23
175		2.98	3.03	3.09	3.14	3.20	3.26	3.31	3.36	3.41	3.45	3.49	3.52	3.55	3.58	3.59	3.58	3.55	3.50	4.16
180		3.39	3.49	3.58	3.55	3.51	3.47	3.53	3.61	3.69	3.73	3.77	3.79	3.83	3.86	3.88	3.88	3.87	3.84	3.84



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	4037	4028	4024	4023	4023	4025	4026	4026	4020	4014	4010	4017	4025	4033	4033	4031	4029	4031	4033
5	3555	3396	3340	3334	3358	3356	3364	3387	3449	3515	3571	3577	3563	3534	3487	3438	3396	3438	3487
10	3418	3287	3285	3341	3425	3484	3528	3545	3466	3373	3294	3327	3376	3415	3349	3275	3220	3275	3349
15	3469	3353	3350	3379	3406	3351	3257	3125	2921	2700	2485	2331	2204	2103	2019	1963	1939	1963	2019
20	3491	3389	3352	3296	3182	2866	2500	2128	1846	1607	1416	1304	1234	1193	1152	1128	1118	1128	1152
25	3678	3566	3226	2793	2322	1919	1560	1268	1127	1053	1022	988	967	954	927	905	890	905	927
30	3248	3101	2668	2152	1642	1357	1151	1011	931	886	858	798	742	692	658	636	625	636	658
35	3035	2849	2315	1704	1135	951	872	845	739	637	545	477	423	383	356	340	335	340	356
40	2387	2171	1771	1338	938	763	656	587	480	385	308	266	241	229	218	212	211	212	218
45	2002	1726	1393	1067	776	598	469	379	304	251	219	209	210	216	213	211	209	211	213
50	1419	1125	917	756	627	482	357	260	221	204	197	168	140	117	106	100	99.2	100	106
55	1097	814	638	520	439	346	269	206	161	128	106	90.8	82.0	77.6	73.8	72.1	72.3	72.1	73.8
60	823	580	439	352	299	231	175	131	98.9	76.3	61.5	53.4	49.5	47.9	43.2	39.6	37.7	39.6	43.2
65	657	449	322	240	189	136	96.3	66.9	43.1	26.0	14.3	6.90	2.95	1.48	1.06	1.58	2.44	1.58	1.06
70	551	388	270	182	119	73.0	42.0	23.0	10.2	3.69	1.58	0.25	0.55	1.74	2.23	2.70	3.00	2.70	2.23
75	381	261	171	105	58.5	31.8	18.0	12.6	6.27	2.90	1.65	0.94	1.11	1.79	2.39	2.97	3.35	2.97	2.39
80	212	140	89.9	55.1	32.6	18.7	11.7	8.94	5.24	3.04	1.99	1.55	1.70	2.22	2.88	3.49	3.89	3.49	2.88
85	91.6	69.3	49.4	32.6	19.6	12.8	8.99	7.19	4.93	3.43	2.58	2.28	2.39	2.80	3.54	4.25	4.70	4.25	3.54
90	37.5	34.7	28.5	21.4	14.6	11.0	8.39	6.63	5.12	4.09	3.47	3.16	3.15	3.39	4.07	4.74	5.17	4.74	4.07
95	26.4	23.6	20.1	16.4	12.9	10.1	7.80	5.96	4.83	4.15	3.80	3.56	3.55	3.75	4.42	5.08	5.50	5.08	4.42
100	25.5	20.5	16.6	13.4	11.0	9.21	7.93	7.00	6.11	5.43	4.94	4.60	4.45	4.51	5.11	5.73	6.13	5.73	5.11
105	19.3	15.0	10.8	7.13	4.49	4.13	4.63	5.56	6.00	6.40	6.70	6.63	6.51	6.45	6.91	7.37	7.65	7.37	6.91
110	14.4	10.1	8.58	8.25	8.40	7.08	5.75	4.63	4.38	4.48	4.83	5.31	5.88	6.46	6.95	7.32	7.51	7.32	6.95
115	16.2	11.4	8.87	7.55	6.95	5.95	5.21	4.72	4.62	4.70	4.86	4.87	4.87	4.88	4.94	4.99	5.01	4.99	4.94
120	13.7	10.2	7.98	6.53	5.64	4.90	4.48	4.31	4.39	4.59	4.82	4.88	4.90	4.92	4.99	5.05	5.07	5.05	4.99
125	11.4	9.20	7.39	5.98	4.97	4.41	4.16	4.16	4.35	4.64	4.95	5.06	5.13	5.18	5.28	5.36	5.39	5.36	5.28
130	9.37	8.00	6.64	5.46	4.56	4.23	4.18	4.31	4.47	4.71	4.97	5.19	5.39	5.57	5.73	5.84	5.88	5.84	5.73
135	4.85	4.71	4.58	4.48	4.42	4.38	4.40	4.48	4.71	4.97	5.24	5.40	5.53	5.63	5.76	5.87	5.92	5.87	5.76
140	5.35	5.88	5.58	5.01	4.40	4.35	4.45	4.63	4.79	4.97	5.18	5.40	5.62	5.83	6.00	6.13	6.21	6.13	6.00
145	4.65	5.17	5.11	4.85	4.54	4.58	4.69	4.86	5.02	5.19	5.39	5.60	5.81	5.99	6.12	6.20	6.24	6.20	6.12
150	4.20	4.71	4.82	4.77	4.68	4.79	4.93	5.08	5.18	5.28	5.40	5.61	5.80	5.96	5.95	5.90	5.83	5.90	5.95
155	4.48	5.05	5.24	5.25	5.16	5.12	5.08	5.06	5.13	5.22	5.34	5.51	5.67	5.77	5.67	5.52	5.38	5.52	5.67
160	4.95	5.55	5.72	5.69	5.53	5.43	5.32	5.24	5.27	5.33	5.38	5.35	5.30	5.23	5.18	5.12	5.07	5.12	5.18
165	5.10	5.65	5.77	5.68	5.47	5.38	5.28	5.19	5.12	5.04	4.94	4.76	4.57	4.42	4.42	4.46	4.50	4.46	4.42
170	4.90	5.30	5.35	5.21	4.96	4.72	4.47	4.25	4.15	4.09	4.04	3.94	3.84	3.76	3.71	3.69	3.69	3.69	3.71
175	4.63	4.91	4.95	4.84	4.63	4.34	4.04	3.78	3.72	3.71	3.71	3.59	3.46	3.36	3.37	3.42	3.48	3.42	3.37
180	3.88	3.89	3.90	3.89	3.87	3.81	3.73	3.65	3.54	3.45	3.36	3.31	3.27	3.27	3.29	3.32	3.37	3.32	3.29

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	4033	4025	4017	4010	4014	4020	4026	4026	4025	4023	4023	4024	4028	4037	4050				
5	3534	3563	3577	3571	3515	3449	3387	3364	3356	3358	3334	3340	3396	3555	3787				
10	3415	3376	3327	3294	3373	3466	3545	3528	3484	3425	3341	3285	3287	3418	3639				
15	2103	2204	2331	2485	2700	2921	3125	3257	3351	3406	3379	3350	3353	3469	3652				
20	1193	1234	1304	1416	1607	1846	2128	2500	2866	3182	3296	3352	3389	3491	3611				
25	954	967	988	1022	1053	1127	1268	1560	1919	2322	2793	3226	3566	3678	3638				
30	692	742	798	858	886	931	1011	1151	1357	1642	2152	2668	3101	3248	3226				
35	383	423	477	545	637	739	845	872	951	1135	1704	2315	2849	3035	3029				
40	229	241	266	308	385	480	587	656	763	938	1338	1771	2171	2387	2506				
45	216	210	209	219	251	304	379	469	598	776	1067	1393	1726	2002	2258				
50	117	140	168	197	204	221	260	357	482	627	756	917	1125	1419	1776				
55	77.6	82.0	90.8	106	128	161	206	269	346	439	520	638	814	1097	1460				
60	47.9	49.5	53.4	61.5	76.3	98.9	131	175	231	299	352	439	580	823	1141				
65	1.48	2.95	6.90	14.3	26.0	43.1	66.9	96.3	136	189	240	322	449	657	925				
70	1.74	0.55	0.25	1.58	3.69	10.2	23.0	42.0	73.0	119	182	270	388	551	750				
75	1.79	1.11	0.94	1.65	2.90	6.27	12.6	18.0	31.8	58.5	105	171	261	381	527				
80	2.22	1.70	1.55	1.99	3.04	5.24	8.94	11.7	18.7	32.6	55.1	89.9	140	212	303				
85	2.80	2.39	2.28	2.58	3.43	4.93	7.19	8.99	12.8	19.6	32.6	49.4	69.3	91.6	117				
90	3.39	3.15	3.16	3.47	4.09	5.12	6.63	8.39	11.0	14.6	21.4	28.5	34.7	37.5	38.4				
95	3.75	3.55	3.56	3.80	4.15	4.83	5.96	7.80	10.1	12.9	16.4	20.1	23.6	26.4	28.8				
100	4.51	4.45	4.60	4.94	5.43	6.11	7.00	7.93	9.21	11.0	13.4	16.6	20.5	25.5	31.5				
105	6.45	6.51	6.63	6.70	6.40	6.00	5.56	4.63	4.13	4.49	7.13	10.8	15.0	19.3	23.8				
110	6.46	5.88	5.31	4.83	4.48	4.38	4.63	5.75	7.08	8.40	8.25	8.58	10.1	14.4	20.7				
115	4.88	4.87	4.87	4.86	4.70	4.62	4.72	5.21	5.95	6.95	7.55	8.87	11.4	16.2	22.7				
120	4.92	4.90	4.88	4.82	4.59	4.39	4.31	4.48	4.90	5.64	6.53	7.98	10.2	13.7	18.1				
125	5.18	5.13	5.06	4.95	4.64	4.35	4.16	4.16	4.41	4.97	5.98	7.39	9.20	11.4	14.1				
130	5.57	5.39	5.19	4.97	4.71	4.47	4.31	4.18	4.23	4.56	5.46	6.64	8.00	9.37	10.8				
135	5.63	5.53	5.40	5.24	4.97	4.71	4.48	4.40	4.38	4.42	4.48	4.58	4.71	4.85	5.01				
140	5.83	5.62	5.40	5.18	4.97	4.79	4.63	4.45	4.35	4.40	5.01	5.58	5.88	5.35	4.30				
145	5.99	5.81	5.60	5.39	5.19	5.02	4.86	4.69	4.58	4.54	4.85	5.11	5.17	4.65	3.77				
150	5.96	5.80	5.61	5.40	5.28	5.18	5.08	4.93	4.79	4.68	4.77	4.82	4.71	4.20	3.44				
155	5.77	5.67	5.51	5.34	5.22	5.13	5.06	5.08	5.12	5.16	5.25	5.24	5.05	4.48	3.65				
160	5.23	5.30	5.35	5.38	5.33	5.27	5.24	5.32	5.43	5.53	5.69	5.72	5.55	4.95	4.04				
165	4.42	4.57	4.76	4.94	5.04	5.12	5.19	5.28	5.38	5.47	5.68	5.77	5.65	5.10	4.23				
170	3.76	3.84	3.94	4.04	4.09	4.15	4.25	4.47	4.72	4.96	5.21	5.35	5.30	4.90	4.23				
175	3.36	3.46	3.59	3.71	3.71	3.72	3.78	4.04	4.34	4.64	4.95	5.18	5.18	4.64	3.86				
180	3.27	3.27	3.31	3.36	3.45	3.54	3.65	3.73	3.81	3.87	3.89	3.90	3.89	3.88	3.17				

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

<b>Model No.</b>	WPX3 @ 100W / 5000K 480	<b>Sample ID</b>	231020002-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

<b>Voltage (Vac)</b>	<b>Frequency (Hz)</b>	<b>Current (A)</b>	<b>Power (W)</b>	<b>Power Factor</b>	<b>iTHD(%)</b>
480.0	60	0.243	101.7	0.873	14.71



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