

## 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: 2024-02-28

Review by:

*Vincent Yuan*

Technical Lead: Vincent Yuan

Issue Date: 2024-02-28

Revised Date: N/A

## 1.0 Test Summary

DLC Technical Requirements V5.1

Integrated Retrofit Kits for 2x4 Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	IES LM-79-2008	3000		4155
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	137.6
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		30.2
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	7.56
			277V	8.53
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
			277V	0.977
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3465±245	3470
		4 steps	3465±124	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		83.5
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		11
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	-12%≤IES Rcs,h1≤+23%		-12%
Zonal Lumen Requirement (0°-60°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≥75%		77.7%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	19.3
		N/A	<22	
Spacing Criterion (Goniophotometer – Section 4.2)	IES LM-79-2008	0°-180°	1.0-2.0	1.28
		90°-270°	1.0-2.0	1.28
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		0.253
(Goniophotometer – Section 4.2)		Non-Worst Case		0.110
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		30.2
(Goniophotometer – Section 4.2)		Non-Worst Case		29.8

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-02-23	RPLED2X4 @30W3500K	240130004-S1
2	Goniophotometer Test	2024-02-23	RPLED2X4 @30W3500K	240130004-S1
3	THD and PF Test	2024-02-23	RPLED2X4 @30W3500K	240130004-S1

### Remark (If any)

1. The results contained in this report pertain only to the tested samples.
2. Test Troffer is Lithonia 2GT8 lensed 2x4.
3. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
4. 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. RPLED2X4 @30W3500K, color tunable from 3500K, 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>	RPLED2X4 @30W3500K	<b>Sample ID</b>	240130004-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

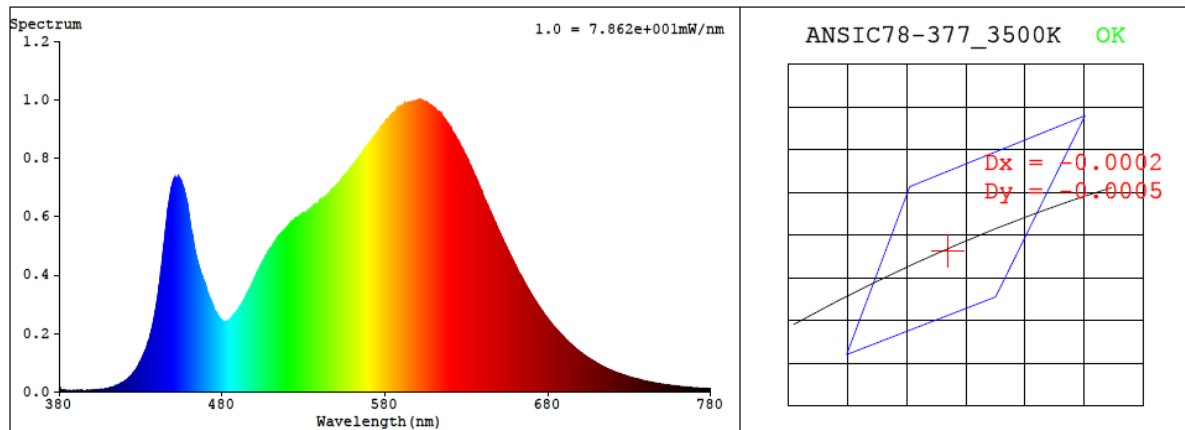
<b>Test Method</b>
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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	0.253	30.2	0.995
277.0	60	0.110	29.8	0.977

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3470	83.5	11	-0.0002	85	95	-12%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.4068$   $y = 0.3910$  /  $u' = 0.2365$   $v' = 0.5116$  ( $duv = -1.91e-04$ )

CCT= 3470K Prcp WL:  $L_d = 581.1\text{nm}$  Purity=39.5%

Peak WL:  $L_p = 602\text{nm}$  FWHM:  $= 144.2\text{nm}$  Ratio: R=20.5% G=76.4% B=3.1%

Render Index:  $R_a = 83.5$  AvgR = 77.5 TM30:  $R_f = 84$   $R_g = 96$

EEL: 0.09740 A++ Highest

R1 =82 R2 =91 R3 =96 R4 =82 R5 =82 R6 =88 R7 =85

R8 =63 R9 =11 R10=78 R11=81 R12=67 R13=84 R14=98 R15=75

## 4.1 Integrating Sphere Test

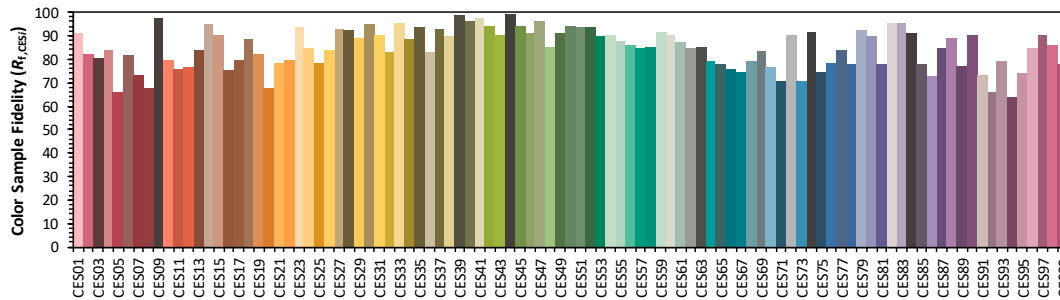
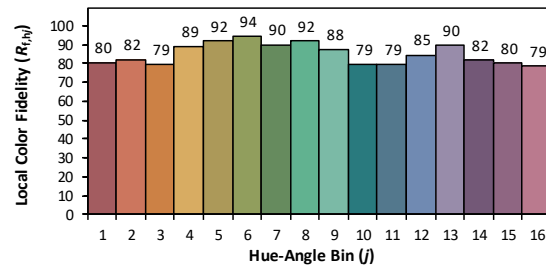
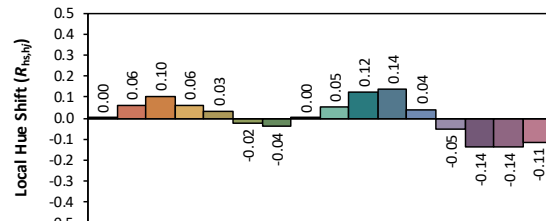
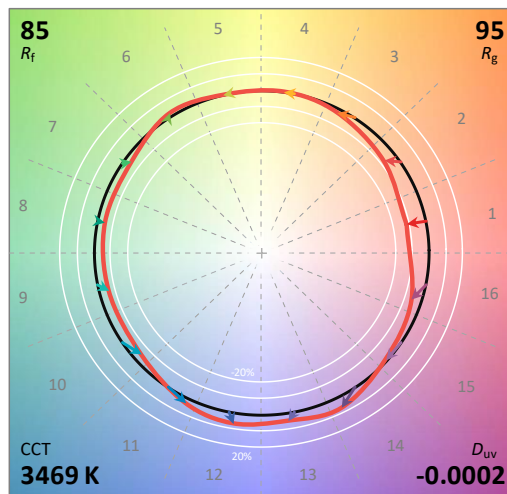
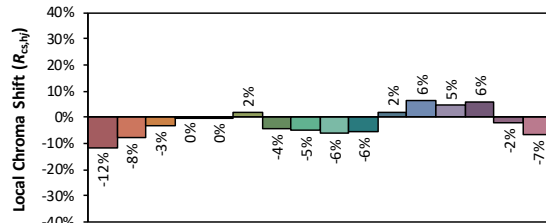
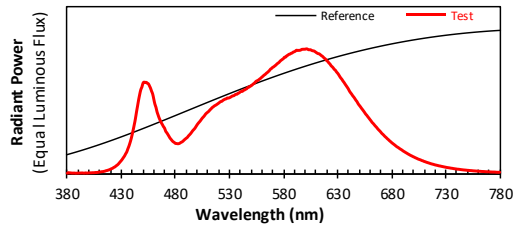
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/2/28

Model: RPLED2X4 @30W3500K



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

$x$  0.4068  
 $y$  0.3909  
 $u'$  0.2366  
 $v'$  0.5116

CIE 13.3-1995  
(CRI)

$R_a$  83  
 $R_g$  11

## 4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	3.20E-06	447	6.35E-04	514	5.28E-04	581	9.33E-04	648	5.77E-04	715	8.37E-05
381	8.00E-06	448	6.72E-04	515	5.34E-04	582	9.32E-04	649	5.60E-04	716	8.06E-05
382	5.90E-06	449	6.93E-04	516	5.42E-04	583	9.43E-04	650	5.49E-04	717	7.80E-05
383	6.10E-06	450	7.23E-04	517	5.47E-04	584	9.48E-04	651	5.38E-04	718	7.58E-05
384	4.60E-06	451	7.33E-04	518	5.52E-04	585	9.55E-04	652	5.25E-04	719	7.34E-05
385	4.50E-06	452	7.29E-04	519	5.58E-04	586	9.57E-04	653	5.14E-04	720	7.07E-05
386	4.50E-06	453	7.32E-04	520	5.64E-04	587	9.63E-04	654	5.02E-04	721	6.86E-05
387	4.40E-06	454	7.23E-04	521	5.71E-04	588	9.66E-04	655	4.90E-04	722	6.66E-05
388	2.90E-06	455	7.19E-04	522	5.77E-04	589	9.73E-04	656	4.77E-04	723	6.45E-05
389	4.20E-06	456	7.02E-04	523	5.79E-04	590	9.76E-04	657	4.68E-04	724	6.22E-05
390	3.80E-06	457	6.84E-04	524	5.87E-04	591	9.80E-04	658	4.56E-04	725	6.08E-05
391	5.00E-06	458	6.59E-04	525	5.92E-04	592	9.88E-04	659	4.45E-04	726	5.86E-05
392	4.80E-06	459	6.37E-04	526	5.97E-04	593	9.86E-04	660	4.33E-04	727	5.69E-05
393	5.30E-06	460	5.97E-04	527	5.99E-04	594	9.87E-04	661	4.22E-04	728	5.51E-05
394	5.60E-06	461	5.57E-04	528	6.06E-04	595	9.87E-04	662	4.10E-04	729	5.31E-05
395	4.20E-06	462	5.31E-04	529	6.05E-04	596	9.90E-04	663	4.01E-04	730	5.14E-05
396	4.50E-06	463	4.95E-04	530	6.08E-04	597	9.95E-04	664	3.91E-04	731	4.96E-05
397	6.10E-06	464	4.69E-04	531	6.12E-04	598	9.95E-04	665	3.81E-04	732	4.81E-05
398	4.10E-06	465	4.45E-04	532	6.18E-04	599	9.96E-04	666	3.72E-04	733	4.69E-05
399	5.30E-06	466	4.25E-04	533	6.23E-04	600	9.96E-04	667	3.61E-04	734	4.54E-05
400	5.90E-06	467	4.07E-04	534	6.24E-04	601	9.98E-04	668	3.51E-04	735	4.37E-05
401	6.50E-06	468	3.92E-04	535	6.30E-04	602	9.98E-04	669	3.42E-04	736	4.27E-05
402	6.40E-06	469	3.76E-04	536	6.35E-04	603	9.93E-04	670	3.33E-04	737	4.09E-05
403	7.30E-06	470	3.64E-04	537	6.36E-04	604	9.92E-04	671	3.22E-04	738	3.96E-05
404	7.30E-06	471	3.40E-04	538	6.43E-04	605	9.91E-04	672	3.14E-04	739	3.82E-05
405	7.70E-06	472	3.28E-04	539	6.46E-04	606	9.87E-04	673	3.05E-04	740	3.70E-05
406	9.00E-06	473	3.14E-04	540	6.54E-04	607	9.83E-04	674	2.96E-04	741	3.56E-05
407	9.10E-06	474	3.00E-04	541	6.58E-04	608	9.82E-04	675	2.89E-04	742	3.51E-05
408	1.01E-05	475	2.85E-04	542	6.59E-04	609	9.78E-04	676	2.80E-04	743	3.39E-05
409	1.14E-05	476	2.74E-04	543	6.67E-04	610	9.71E-04	677	2.73E-04	744	3.25E-05
410	1.25E-05	477	2.64E-04	544	6.70E-04	611	9.66E-04	678	2.64E-04	745	3.15E-05
411	1.42E-05	478	2.55E-04	545	6.76E-04	612	9.61E-04	679	2.57E-04	746	3.03E-05
412	1.56E-05	479	2.50E-04	546	6.80E-04	613	9.59E-04	680	2.49E-04	747	2.95E-05
413	1.64E-05	480	2.42E-04	547	6.90E-04	614	9.53E-04	681	2.42E-04	748	2.86E-05
414	1.84E-05	481	2.41E-04	548	6.92E-04	615	9.45E-04	682	2.35E-04	749	2.79E-05
415	2.06E-05	482	2.40E-04	549	6.98E-04	616	9.40E-04	683	2.29E-04	750	2.67E-05
416	2.39E-05	483	2.40E-04	550	7.03E-04	617	9.31E-04	684	2.21E-04	751	2.62E-05
417	2.57E-05	484	2.43E-04	551	7.10E-04	618	9.23E-04	685	2.15E-04	752	2.52E-05
418	2.88E-05	485	2.49E-04	552	7.18E-04	619	9.16E-04	686	2.10E-04	753	2.46E-05
419	3.16E-05	486	2.54E-04	553	7.24E-04	620	9.04E-04	687	2.03E-04	754	2.40E-05
420	3.59E-05	487	2.60E-04	554	7.34E-04	621	8.98E-04	688	1.97E-04	755	2.30E-05
421	3.98E-05	488	2.69E-04	555	7.41E-04	622	8.86E-04	689	1.92E-04	756	2.21E-05
422	4.36E-05	489	2.76E-04	556	7.45E-04	623	8.78E-04	690	1.86E-04	757	2.16E-05
423	4.98E-05	490	2.83E-04	557	7.50E-04	624	8.64E-04	691	1.80E-04	758	2.09E-05
424	5.38E-05	491	2.90E-04	558	7.58E-04	625	8.56E-04	692	1.75E-04	759	2.03E-05
425	6.12E-05	492	3.01E-04	559	7.64E-04	626	8.47E-04	693	1.69E-04	760	1.95E-05
426	6.75E-05	493	3.10E-04	560	7.73E-04	627	8.35E-04	694	1.64E-04	761	1.90E-05
427	7.50E-05	494	3.20E-04	561	7.80E-04	628	8.28E-04	695	1.59E-04	762	1.86E-05
428	8.49E-05	495	3.31E-04	562	7.88E-04	629	8.15E-04	696	1.54E-04	763	1.78E-05
429	9.53E-05	496	3.43E-04	563	7.94E-04	630	8.05E-04	697	1.49E-04	764	1.72E-05
430	1.05E-04	497	3.53E-04	564	8.02E-04	631	7.93E-04	698	1.44E-04	765	1.70E-05
431	1.17E-04	498	3.63E-04	565	8.09E-04	632	7.79E-04	699	1.40E-04	766	1.64E-05
432	1.30E-04	499	3.76E-04	566	8.17E-04	633	7.65E-04	700	1.36E-04	767	1.56E-05
433	1.42E-04	500	3.90E-04	567	8.25E-04	634	7.55E-04	701	1.32E-04	768	1.54E-05
434	1.59E-04	501	4.02E-04	568	8.36E-04	635	7.42E-04	702	1.27E-04	769	1.48E-05
435	1.74E-04	502	4.12E-04	569	8.42E-04	636	7.30E-04	703	1.24E-04	770	1.45E-05
436	1.98E-04	503	4.22E-04	570	8.51E-04	637	7.17E-04	704	1.19E-04	771	1.38E-05
437	2.20E-04	504	4.34E-04	571	8.55E-04	638	7.04E-04	705	1.15E-04	772	1.34E-05
438	2.47E-04	505	4.46E-04	572	8.63E-04	639	6.91E-04	706	1.12E-04	773	1.30E-05
439	2.77E-04	506	4.55E-04	573	8.69E-04	640	6.78E-04	707	1.09E-04	774	1.28E-05
440	3.12E-04	507	4.65E-04	574	8.78E-04	641	6.61E-04	708	1.05E-04	775	1.27E-05
441	3.52E-04	508	4.77E-04	575	8.85E-04	642	6.48E-04	709	1.02E-04	776	1.22E-05
442	3.94E-04	509	4.86E-04	576	8.92E-04	643	6.37E-04	710	9.81E-05	777	1.13E-05
443	4.39E-04	510	4.93E-04	577	9.01E-04	644	6.24E-04	711	9.56E-05	778	1.09E-05
444	4.93E-04	511	5.00E-04	578	9.08E-04	645	6.13E-04	712	9.22E-05	779	1.09E-05
445	5.42E-04	512	5.11E-04	579	9.15E-04	646	6.01E-04	713	8.91E-05	780	1.09E-05
446	5.92E-04	513	5.19E-04	580	9.21E-04	647	5.87E-04	714	8.65E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	RPLED2X4 @30W3500K	<b>Sample ID</b>	240130004-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	24.8	<b>Humidity (%RH)</b>	42.3

<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	0.253	30.2	0.995
<b>NON-WORST CASE</b>	277.0	60	0.110	29.8	0.977

#### Test Result

Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement
	C0-180	C90-270	C0-180	C90-270		( $0^\circ$ - $60^\circ$ )
4155	164.3	164.5	113.2	114.1	137.6	77.7%

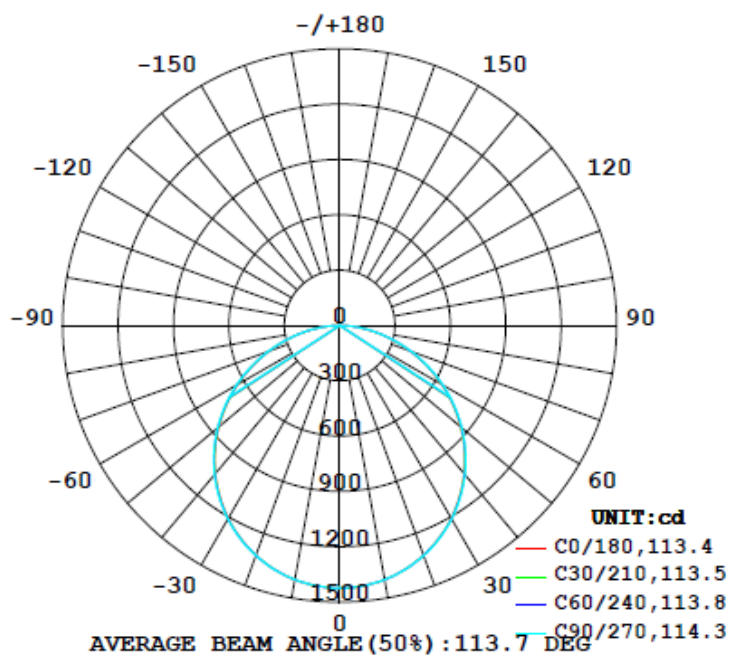
UGR		Spacing Criterion	
Crosswise	Endwise	( $0^\circ$ - $180^\circ$ )	( $90^\circ$ - $270^\circ$ )
19.2	19.3	1.28	1.28



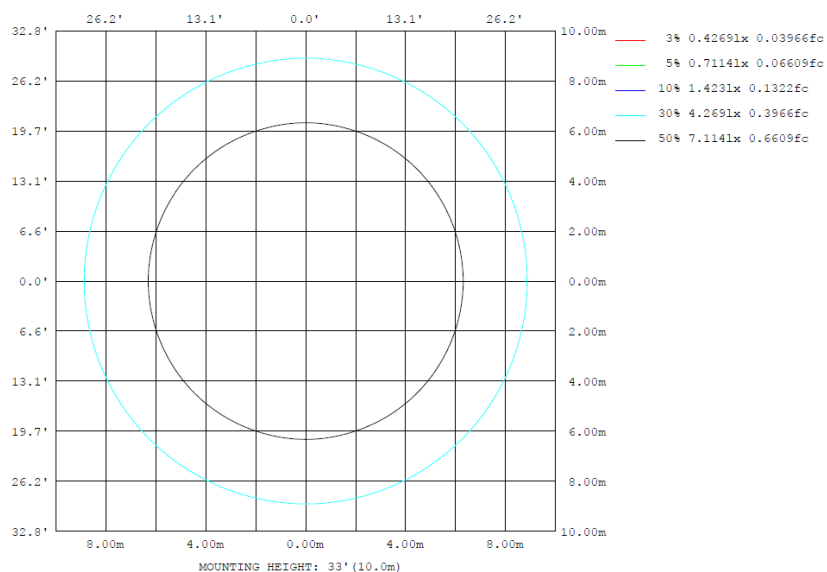
## 4.2 Goniophotometer Test

### 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	ℓlum, lamp
10	1400	1400	1399	1400	1400	1400	1399	1400	0~ 10	134.7	134.7	3.24,3.24
20	1327	1327	1328	1327	1327	1327	1328	1327	10~ 20	386.4	521.1	12.5,12.5
30	1207	1210	1213	1210	1207	1210	1213	1210	20~ 30	587.0	1108	26.7,26.7
40	1047	1052	1056	1052	1047	1052	1056	1052	30~ 40	710.0	1818	43.8,43.8
50	854.5	860.3	864.5	860.3	854.5	860.3	864.5	860.3	40~ 50	739.6	2558	61.6,61.6
60	637.8	641.8	646.9	641.8	637.8	641.8	646.9	641.8	50~ 60	672.6	3230	77.7,77.7
70	407.5	409.4	413.4	409.4	407.5	409.4	413.4	409.4	60~ 70	520.4	3751	90.3,90.3
80	182.6	183.0	185.6	183.0	182.6	183.0	185.6	183.0	70~ 80	310.9	4062	97.8,97.8
90	0	0	0	0	0	0	0	0	80~ 90	93.19	4155	100,100
100	0	0	0	0	0	0	0	0	90~100	0	4155	100,100
110	0	0	0	0	0	0	0	0	100~110	0	4155	100,100
120	0	0	0	0	0	0	0	0	110~120	0	4155	100,100
130	0	0	0	0	0	0	0	0	120~130	0	4155	100,100
140	0	0	0	0	0	0	0	0	130~140	0	4155	100,100
150	0	0	0	0	0	0	0	0	140~150	0	4155	100,100
160	0	0	0	0	0	0	0	0	150~160	0	4155	100,100
170	0	0	0	0	0	0	0	0	160~170	0	4155	100,100
180	0	0	0	0	0	0	0	0	170~180	0	4155	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	134.71	0-10	134.71	3.24%
10-20	386.38	0-20	521.09	12.54%
20-30	587.00	0-30	1108.09	26.67%
30-40	709.98	0-40	1818.07	43.76%
40-50	739.63	0-50	2557.70	61.56%
50-60	672.61	0-60	3230.31	77.75%
60-70	520.45	0-70	3750.76	90.27%
70-80	310.89	0-80	4061.65	97.76%
80-90	93.19	0-90	4154.84	100.00%
90-100	0.00	0-100	4154.84	100.00%
100-110	0.00	0-110	4154.84	100.00%
110-120	0.00	0-120	4154.84	100.00%
120-130	0.00	0-130	4154.84	100.00%
130-140	0.00	0-140	4154.84	100.00%
140-150	0.00	0-150	4154.84	100.00%
150-160	0.00	0-160	4154.84	100.00%
160-170	0.00	0-170	4154.84	100.00%
170-180	0.00	0-180	4154.84	100.00%

## 4.2 Goniophotometer Test

UGR – Uncorrected Table:

**UGR TABLE - UNCORRECTED**

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	9.7	11.3	10.0	11.6	11.9	9.7	11.4	10.1	11.7	12.0
	3H	11.5	13.0	11.9	13.4	13.7	11.6	13.1	12.0	13.4	13.8
	4H	12.3	13.7	12.7	14.0	14.4	12.3	13.7	12.7	14.1	14.5
	6H	12.8	14.1	13.2	14.5	14.9	12.9	14.2	13.3	14.6	15.0
	8H	13.0	14.3	13.4	14.7	15.1	13.1	14.3	13.5	14.7	15.1
	12H	13.1	14.3	13.6	14.7	15.2	13.2	14.4	13.6	14.8	15.2
4H	2H	10.3	11.7	10.7	12.1	12.5	10.4	11.8	10.8	12.1	12.5
	3H	12.4	13.6	12.8	14.0	14.4	12.5	13.7	12.9	14.1	14.5
	4H	13.3	14.4	13.7	14.8	15.2	13.3	14.4	13.8	14.8	15.3
	6H	14.0	14.9	14.4	15.4	15.8	14.0	15.0	14.5	15.4	15.9
	8H	14.2	15.1	14.7	15.6	16.0	14.3	15.2	14.7	15.6	16.1
	12H	14.4	15.2	14.9	15.7	16.2	14.5	15.3	15.0	15.8	16.2
8H	4H	13.6	14.5	14.1	15.0	15.4	13.7	14.6	14.1	15.0	15.5
	6H	14.5	15.2	14.9	15.7	16.2	14.5	15.3	15.0	15.7	16.2
	8H	14.8	15.5	15.3	16.0	16.4	14.8	15.5	15.4	16.0	16.5
	12H	15.1	15.6	15.6	16.1	16.7	15.1	15.7	15.6	16.2	16.8
12H	4H	13.7	14.5	14.2	15.0	15.4	13.7	14.5	14.2	15.0	15.5
	6H	14.6	15.2	15.1	15.7	16.2	14.6	15.3	15.1	15.7	16.3
	8H	14.9	15.5	15.4	16.0	16.6	15.0	15.6	15.5	16.1	16.6

Maximum UGR = 16.8

UGR – Corrected Table:

**UGR TABLE - CORRECTED**

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	14.7	16.3	15.0	16.6	16.9	14.7	16.4	15.1	16.7	17.0
	3H	16.5	18.0	16.9	18.4	18.7	16.6	18.1	17.0	18.4	18.8
	4H	17.3	18.7	17.7	19.0	19.4	17.3	18.7	17.7	19.1	19.5
	6H	17.8	19.1	18.2	19.5	19.9	17.9	19.2	18.3	19.6	20.0
	8H	18.0	19.3	18.4	19.7	20.1	18.1	19.3	18.5	19.7	20.1
	12H	18.1	19.3	18.6	19.7	20.2	18.2	19.4	18.6	19.8	20.2
4H	2H	15.3	16.7	15.7	17.1	17.5	15.4	16.8	15.8	17.1	17.5
	3H	17.4	18.6	17.8	19.0	19.4	17.5	18.7	17.9	19.1	19.5
	4H	18.3	19.4	18.7	19.8	20.2	18.3	19.4	18.8	19.8	20.3
	6H	19.0	19.9	19.4	20.4	20.8	19.0	20.0	19.5	20.4	20.9
	8H	19.2	20.1	19.7	20.6	21.0	19.3	20.2	19.7	20.6	21.1
	12H	19.4	20.2	19.9	20.7	21.2	19.5	20.3	20.0	20.8	21.2
8H	4H	18.6	19.5	19.1	20.0	20.4	18.7	19.6	19.1	20.0	20.5
	6H	19.5	20.2	19.9	20.7	21.2	19.5	20.3	20.0	20.7	21.2
	8H	19.8	20.5	20.3	21.0	21.4	19.8	20.5	20.4	21.0	21.5
	12H	20.1	20.6	20.6	21.1	21.7	20.1	20.7	20.6	21.2	21.8
12H	4H	18.7	19.5	19.2	20.0	20.4	18.7	19.5	19.2	20.0	20.5
	6H	19.6	20.2	20.1	20.7	21.2	19.6	20.3	20.1	20.7	21.3
	8H	19.9	20.5	20.4	21.0	21.6	20.0	20.6	20.5	21.1	21.6

Maximum UGR = 21.8

## 4.2 Goniophotometer Test

### Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG) y (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	1423	1424	1423	1422	1423	1424	1422	1424	1423	1422	1423	1424	1423	1424	1423	1422	1423	1424	1422
5	1419	1417	1417	1417	1418	1417	1417	1417	1418	1417	1417	1417	1419	1417	1417	1417	1418	1417	1417
10	1400	1399	1399	1400	1400	1398	1399	1398	1400	1400	1399	1399	1400	1399	1399	1400	1400	1398	1399
15	1369	1370	1368	1368	1370	1369	1370	1369	1370	1368	1368	1370	1369	1370	1368	1368	1370	1369	1370
20	1327	1326	1327	1327	1326	1327	1328	1327	1326	1327	1327	1326	1327	1326	1327	1327	1326	1327	1328
25	1272	1273	1273	1274	1274	1274	1276	1274	1274	1274	1273	1273	1272	1273	1273	1274	1274	1274	1276
30	1207	1208	1209	1210	1211	1211	1213	1211	1210	1209	1208	1207	1208	1209	1210	1211	1211	1213	1213
35	1132	1132	1134	1136	1136	1136	1139	1136	1136	1136	1134	1132	1132	1132	1134	1136	1136	1136	1139
40	1047	1048	1050	1052	1053	1054	1056	1054	1053	1052	1050	1048	1047	1048	1050	1052	1053	1054	1056
45	955	955	957	960	961	961	964	961	961	960	957	955	955	955	957	960	961	961	964
50	854	855	858	860	861	863	865	863	861	860	858	855	854	855	858	860	861	863	865
55	748	748	750	753	755	756	759	756	755	753	750	748	748	748	750	753	755	756	759
60	638	637	639	642	643	644	647	644	643	642	639	637	638	637	639	642	643	644	647
65	524	523	525	527	527	529	531	529	527	527	525	523	524	523	525	527	527	529	531
70	407	407	408	409	410	411	413	411	410	409	408	407	407	407	408	409	410	411	413
75	293	293	293	294	294	295	297	295	294	294	293	293	293	293	294	294	295	297	297
80	183	183	183	183	183	184	186	184	183	183	183	183	183	183	183	183	183	184	186
85	82.4	82.2	82.2	82.4	82.6	83.1	84.2	83.1	82.6	82.4	82.2	82.2	82.4	82.2	82.2	82.4	82.6	83.1	84.2
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table--2

UNIT: cd

C (DEG) y (DEG)	285	300	315	330	345														
0	1424	1423	1422	1423	1424														
5	1417	1418	1417	1417	1417														
10	1398	1400	1400	1399	1399														
15	1369	1370	1368	1368	1370														
20	1327	1326	1327	1327	1326														
25	1274	1274	1274	1273	1273														
30	1211	1211	1210	1209	1208														
35	1136	1136	1136	1134	1132														
40	1054	1053	1052	1050	1048														
45	961	961	960	957	955														
50	863	861	860	858	855														
55	756	755	753	750	748														
60	644	643	642	639	637														
65	529	527	527	525	523														
70	411	410	409	408	407														
75	295	294	294	293	293														
80	184	183	183	183	183														
85	83.1	82.6	82.4	82.2	82.2														
90	0.00	0.00	0.00	0.00	0.00														
95	0.00	0.00	0.00	0.00	0.00														
100	0.00	0.00	0.00	0.00	0.00														
105	0.00	0.00	0.00	0.00	0.00														
110	0.00	0.00	0.00	0.00	0.00														
115	0.00	0.00	0.00	0.00	0.00														
120	0.00	0.00	0.00	0.00	0.00														
125	0.00	0.00	0.00	0.00	0.00														
130	0.00	0.00	0.00	0.00	0.00														
135	0.00	0.00	0.00	0.00	0.00														
140	0.00	0.00	0.00	0.00	0.00														
145	0.00	0.00	0.00	0.00	0.00														
150	0.00	0.00	0.00	0.00	0.00														
155	0.00	0.00	0.00	0.00	0.00														
160	0.00	0.00	0.00	0.00	0.00														
165	0.00	0.00	0.00	0.00	0.00														
170	0.00	0.00	0.00	0.00	0.00														
175	0.00	0.00	0.00	0.00	0.00														
180	0.00	0.00	0.00	0.00	0.00														

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

<b>Model No.</b>	RPLED2X4 @30W3500K	<b>Sample ID</b>	240130004-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	0.253	30.2	0.995	7.56
277.0	60	0.110	29.8	0.977	8.53

## 5.0 Equipment List:

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

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