

## Photometric Test Report

### Relevant Standards

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

Prepared For

**RAB Lighting Inc.**

Prepared By

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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		4274
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	142.5
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		30.0
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	7.57
			277V	8.44
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	5029±283	5023
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		84.4
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		14
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		84
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		95
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-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	1.26
		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		0.251
(Goniophotometer – Section 4.2)		Non-Worst Case		0.109
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		30.0
(Goniophotometer – Section 4.2)		Non-Worst Case		29.5

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-02-23	RPLED2X4 @30W5000K	240130004-S1
2	Goniophotometer Test	2024-02-23	RPLED2X4 @30W5000K	240130004-S1
3	THD and PF Test	2024-02-23	RPLED2X4 @30W5000K	240130004-S1

### Remark (If any)

- The results contained in this report pertain only to the tested samples.
- Test Troffer is Lithonia 2GT8 lensed 2x4.
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- 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 @30W5000K, 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 @30W5000K	<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

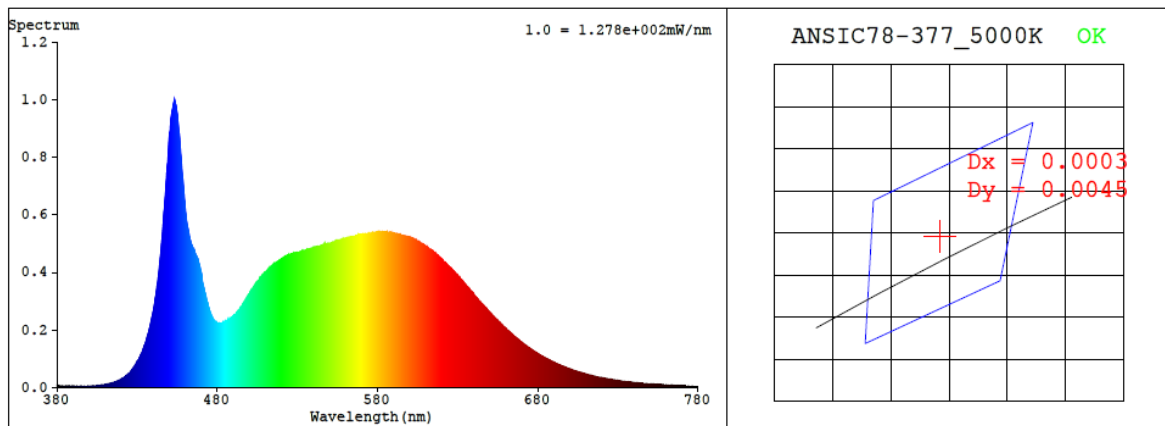
<b>Test Method</b>
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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. 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	0.251	30.0	0.995
277.0	60	0.109	29.5	0.977

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5023	84.4	14	0.0021	84	95	-12%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3448$   $y = 0.3556$  /  $u' = 0.2097$   $v' = 0.4866$  ( $duv = 2.14e-03$ )

CCT= 5023K Prcp WL:  $L_d = 570.3\text{nm}$  Purity=10.2%

Peak WL:  $L_p = 453\text{nm}$  FWHM:  $= 18.8\text{nm}$  Ratio: R=15.9% G=79.4% B=4.7%

Render Index:  $R_a = 84.4$  AvgR = 77.9 TM30: Rf=84 Rg=95

EEL: 0.09447 A++ Highest

R1 =83	R2 =90	R3 =94	R4 =83	R5 =83	R6 =86	R7 =87
R8 =69	R9 =14	R10=76	R11=82	R12=61	R13=85	R14=97 R15=78

## 4.1 Integrating Sphere Test

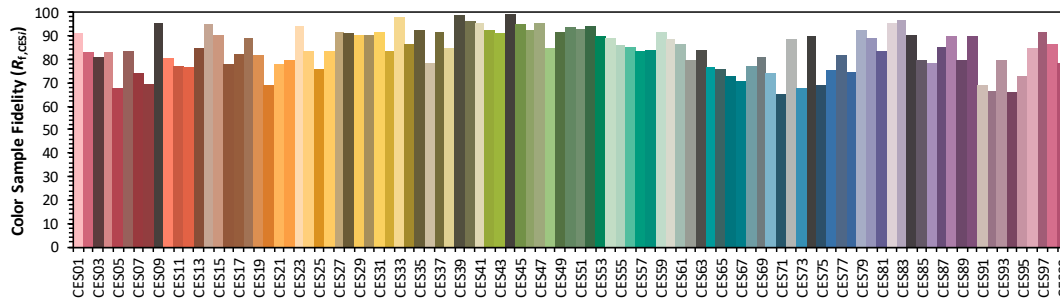
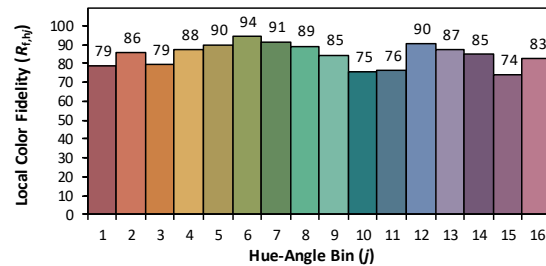
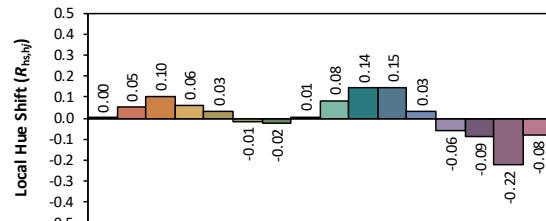
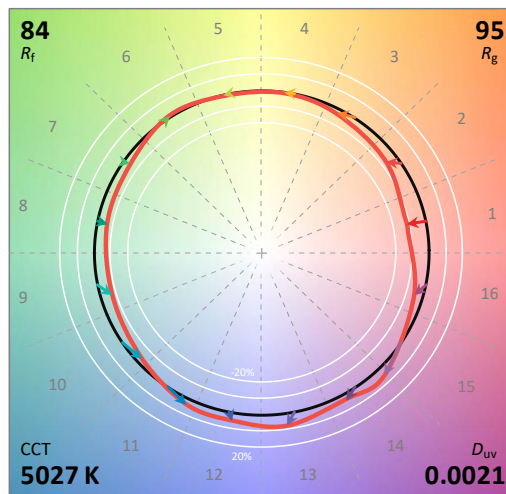
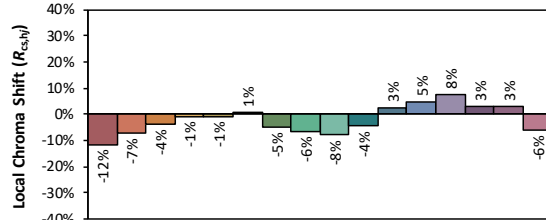
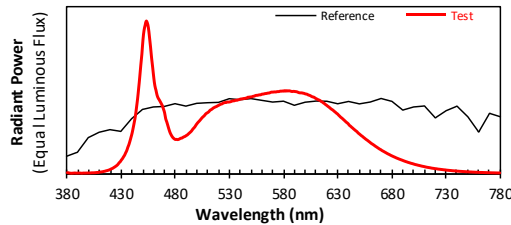
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/2/28

Model: RPLED2X4 @30W5000K



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

$x$  0.3447  
 $y$  0.3555  
 $u'$  0.2097  
 $v'$  0.4865

CIE 13.3-1995  
(CRI)

$R_a$  84  
 $R_g$  14

## 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	7.00E-06	447	6.29E-04	514	4.22E-04	581	5.42E-04	648	2.74E-04	715	3.98E-05
381	6.60E-06	448	7.09E-04	515	4.28E-04	582	5.39E-04	649	2.66E-04	716	3.86E-05
382	4.50E-06	449	7.81E-04	516	4.32E-04	583	5.41E-04	650	2.61E-04	717	3.69E-05
383	3.80E-06	450	8.74E-04	517	4.36E-04	584	5.40E-04	651	2.55E-04	718	3.59E-05
384	3.20E-06	451	9.35E-04	518	4.38E-04	585	5.41E-04	652	2.49E-04	719	3.49E-05
385	4.00E-06	452	9.67E-04	519	4.43E-04	586	5.40E-04	653	2.44E-04	720	3.36E-05
386	4.40E-06	453	9.95E-04	520	4.46E-04	587	5.38E-04	654	2.38E-04	721	3.29E-05
387	5.10E-06	454	9.83E-04	521	4.50E-04	588	5.36E-04	655	2.32E-04	722	3.19E-05
388	4.20E-06	455	9.52E-04	522	4.54E-04	589	5.37E-04	656	2.26E-04	723	3.05E-05
389	4.10E-06	456	8.92E-04	523	4.55E-04	590	5.37E-04	657	2.21E-04	724	2.98E-05
390	4.70E-06	457	8.26E-04	524	4.60E-04	591	5.36E-04	658	2.16E-04	725	2.89E-05
391	4.50E-06	458	7.53E-04	525	4.63E-04	592	5.35E-04	659	2.10E-04	726	2.80E-05
392	4.50E-06	459	6.92E-04	526	4.64E-04	593	5.33E-04	660	2.05E-04	727	2.72E-05
393	3.60E-06	460	6.26E-04	527	4.65E-04	594	5.29E-04	661	1.99E-04	728	2.62E-05
394	3.80E-06	461	5.74E-04	528	4.68E-04	595	5.28E-04	662	1.95E-04	729	2.54E-05
395	4.70E-06	462	5.45E-04	529	4.67E-04	596	5.27E-04	663	1.90E-04	730	2.48E-05
396	4.40E-06	463	5.14E-04	530	4.68E-04	597	5.27E-04	664	1.85E-04	731	2.35E-05
397	4.70E-06	464	4.94E-04	531	4.70E-04	598	5.25E-04	665	1.80E-04	732	2.30E-05
398	4.80E-06	465	4.82E-04	532	4.72E-04	599	5.24E-04	666	1.75E-04	733	2.22E-05
399	5.10E-06	466	4.70E-04	533	4.75E-04	600	5.21E-04	667	1.70E-04	734	2.16E-05
400	5.10E-06	467	4.56E-04	534	4.75E-04	601	5.20E-04	668	1.66E-04	735	2.10E-05
401	5.00E-06	468	4.42E-04	535	4.77E-04	602	5.18E-04	669	1.61E-04	736	2.02E-05
402	5.90E-06	469	4.20E-04	536	4.80E-04	603	5.13E-04	670	1.57E-04	737	1.95E-05
403	6.30E-06	470	3.98E-04	537	4.79E-04	604	5.12E-04	671	1.52E-04	738	1.91E-05
404	6.20E-06	471	3.59E-04	538	4.82E-04	605	5.08E-04	672	1.48E-04	739	1.82E-05
405	6.60E-06	472	3.38E-04	539	4.83E-04	606	5.04E-04	673	1.44E-04	740	1.77E-05
406	7.20E-06	473	3.15E-04	540	4.86E-04	607	5.01E-04	674	1.40E-04	741	1.71E-05
407	8.00E-06	474	2.91E-04	541	4.88E-04	608	5.00E-04	675	1.36E-04	742	1.67E-05
408	8.40E-06	475	2.70E-04	542	4.88E-04	609	4.95E-04	676	1.32E-04	743	1.60E-05
409	8.80E-06	476	2.55E-04	543	4.90E-04	610	4.90E-04	677	1.28E-04	744	1.56E-05
410	1.06E-05	477	2.42E-04	544	4.91E-04	611	4.87E-04	678	1.25E-04	745	1.52E-05
411	1.17E-05	478	2.34E-04	545	4.93E-04	612	4.83E-04	679	1.21E-04	746	1.46E-05
412	1.25E-05	479	2.28E-04	546	4.93E-04	613	4.80E-04	680	1.18E-04	747	1.42E-05
413	1.40E-05	480	2.23E-04	547	4.99E-04	614	4.76E-04	681	1.14E-04	748	1.39E-05
414	1.56E-05	481	2.24E-04	548	4.98E-04	615	4.71E-04	682	1.11E-04	749	1.33E-05
415	1.71E-05	482	2.23E-04	549	5.00E-04	616	4.67E-04	683	1.08E-04	750	1.29E-05
416	1.95E-05	483	2.24E-04	550	5.01E-04	617	4.61E-04	684	1.05E-04	751	1.26E-05
417	2.09E-05	484	2.28E-04	551	5.02E-04	618	4.57E-04	685	1.02E-04	752	1.22E-05
418	2.34E-05	485	2.32E-04	552	5.05E-04	619	4.51E-04	686	9.88E-05	753	1.17E-05
419	2.57E-05	486	2.33E-04	553	5.06E-04	620	4.46E-04	687	9.59E-05	754	1.15E-05
420	2.93E-05	487	2.37E-04	554	5.10E-04	621	4.40E-04	688	9.32E-05	755	1.09E-05
421	3.28E-05	488	2.41E-04	555	5.11E-04	622	4.35E-04	689	9.05E-05	756	1.07E-05
422	3.57E-05	489	2.44E-04	556	5.11E-04	623	4.29E-04	690	8.80E-05	757	1.04E-05
423	4.06E-05	490	2.49E-04	557	5.13E-04	624	4.23E-04	691	8.50E-05	758	9.80E-06
424	4.48E-05	491	2.53E-04	558	5.15E-04	625	4.18E-04	692	8.25E-05	759	9.80E-06
425	5.00E-05	492	2.60E-04	559	5.15E-04	626	4.13E-04	693	7.98E-05	760	9.40E-06
426	5.53E-05	493	2.66E-04	560	5.19E-04	627	4.07E-04	694	7.77E-05	761	9.10E-06
427	6.28E-05	494	2.72E-04	561	5.19E-04	628	4.01E-04	695	7.50E-05	762	8.60E-06
428	7.22E-05	495	2.80E-04	562	5.21E-04	629	3.95E-04	696	7.29E-05	763	8.60E-06
429	7.89E-05	496	2.90E-04	563	5.23E-04	630	3.90E-04	697	7.07E-05	764	8.50E-06
430	8.97E-05	497	2.98E-04	564	5.23E-04	631	3.82E-04	698	6.83E-05	765	8.00E-06
431	9.83E-05	498	3.06E-04	565	5.25E-04	632	3.75E-04	699	6.66E-05	766	7.90E-06
432	1.10E-04	499	3.17E-04	566	5.26E-04	633	3.68E-04	700	6.46E-05	767	7.70E-06
433	1.21E-04	500	3.27E-04	567	5.27E-04	634	3.63E-04	701	6.22E-05	768	7.40E-06
434	1.37E-04	501	3.35E-04	568	5.30E-04	635	3.57E-04	702	6.01E-05	769	7.00E-06
435	1.51E-04	502	3.43E-04	569	5.32E-04	636	3.50E-04	703	5.86E-05	770	7.00E-06
436	1.73E-04	503	3.51E-04	570	5.32E-04	637	3.44E-04	704	5.67E-05	771	6.60E-06
437	1.91E-04	504	3.59E-04	571	5.33E-04	638	3.37E-04	705	5.49E-05	772	6.50E-06
438	2.14E-04	505	3.67E-04	572	5.34E-04	639	3.31E-04	706	5.34E-05	773	6.20E-06
439	2.40E-04	506	3.74E-04	573	5.33E-04	640	3.25E-04	707	5.15E-05	774	6.10E-06
440	2.67E-04	507	3.81E-04	574	5.35E-04	641	3.16E-04	708	4.98E-05	775	6.00E-06
441	3.01E-04	508	3.90E-04	575	5.36E-04	642	3.10E-04	709	4.83E-05	776	5.80E-06
442	3.37E-04	509	3.95E-04	576	5.36E-04	643	3.04E-04	710	4.69E-05	777	5.50E-06
443	3.77E-04	510	4.00E-04	577	5.38E-04	644	2.98E-04	711	4.52E-05	778	5.40E-06
444	4.31E-04	511	4.05E-04	578	5.38E-04	645	2.91E-04	712	4.36E-05	779	5.40E-06
445	4.88E-04	512	4.13E-04	579	5.39E-04	646	2.86E-04	713	4.22E-05	780	5.40E-06
446	5.56E-04	513	4.18E-04	580	5.39E-04	647	2.80E-04	714	4.10E-05	N/A	N/A

## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	RPLED2X4 @30W5000K	<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	0.251	30.0	0.995
<b>NON-WORST CASE</b>	277.0	60	0.109	29.5	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		( $0^\circ$ - $60^\circ$ )
4274	164.4	164.6	113.3	114.1	142.5	77.7%

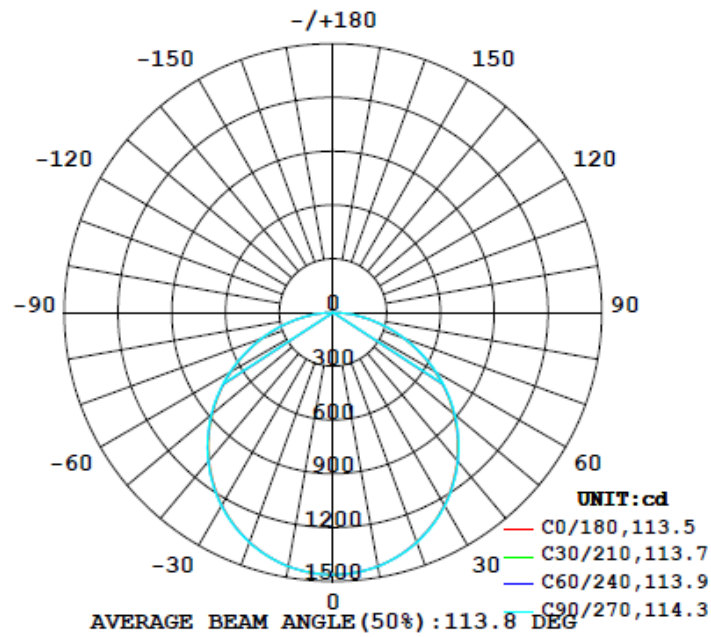
UGR		Spacing Criterion	
Crosswise	Endwise	( $0^\circ$ - $180^\circ$ )	( $90^\circ$ - $270^\circ$ )
19.2	19.3	1.26	1.28



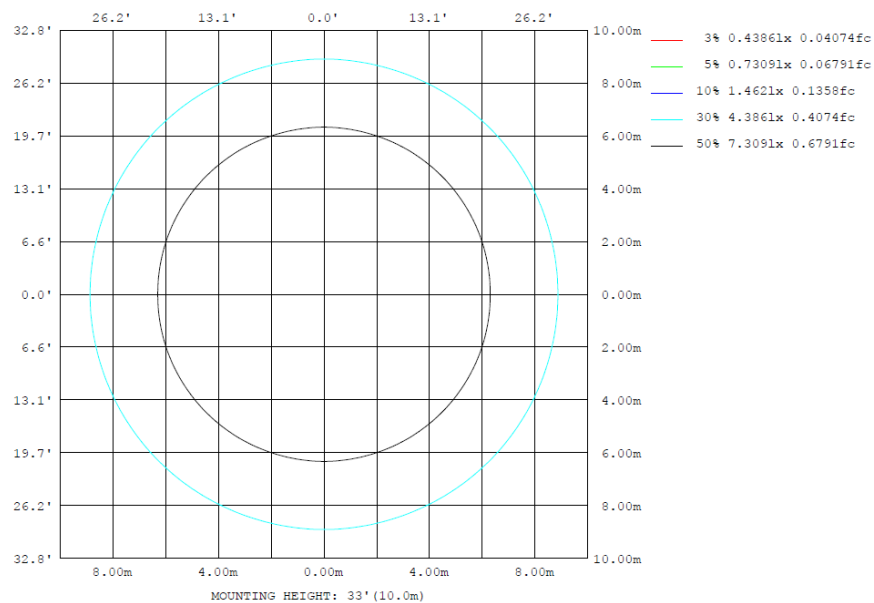
## 4.2 Goniophotometer Test

### 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	%lum, lamp
10	1437	1437	1438	1437	1437	1437	1438	1437	0- 10	138.4	138.4	3.24, 3.24
20	1364	1365	1366	1365	1364	1365	1366	1365	10- 20	397.1	535.5	12.5, 12.5
30	1242	1244	1246	1244	1242	1244	1246	1244	20- 30	603.4	1139	26.6, 26.6
40	1077	1083	1086	1083	1077	1083	1086	1083	30- 40	730.1	1869	43.7, 43.7
50	879.1	885.4	888.7	885.4	879.1	885.4	888.7	885.4	40- 50	760.5	2630	61.5, 61.5
60	656.5	660.6	665.4	660.6	656.5	660.6	665.4	660.6	50- 60	692.1	3322	77.7, 77.7
70	419.7	421.9	425.6	421.9	419.7	421.9	425.6	421.9	60- 70	535.8	3857	90.3, 90.3
80	188.5	188.7	191.1	188.7	188.5	188.7	191.1	188.7	70- 80	320.3	4178	97.7, 97.7
90	0	0	0	0	0	0	0	0	80- 90	96.20	4274	100, 100
100	0	0	0	0	0	0	0	0	90-100	0	4274	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	4274	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	4274	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	4274	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	4274	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	4274	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	4274	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	4274	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	4274	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	138.41	0-10	138.41	3.24%
10-20	397.10	0-20	535.51	12.53%
20-30	603.40	0-30	1138.91	26.65%
30-40	730.09	0-40	1869.00	43.73%
40-50	760.51	0-50	2629.51	61.52%
50-60	692.08	0-60	3321.59	77.72%
60-70	535.77	0-70	3857.36	90.25%
70-80	320.35	0-80	4177.71	97.75%
80-90	96.20	0-90	4273.91	100.00%
90-100	0.00	0-100	4273.91	100.00%
100-110	0.00	0-110	4273.91	100.00%
110-120	0.00	0-120	4273.91	100.00%
120-130	0.00	0-130	4273.91	100.00%
130-140	0.00	0-140	4273.91	100.00%
140-150	0.00	0-150	4273.91	100.00%
150-160	0.00	0-160	4273.91	100.00%
160-170	0.00	0-170	4273.91	100.00%
170-180	0.00	0-180	4273.91	100.00%

## 4.2 Goniophotometer Test

UGR – Uncorrected Table:

**UGR TABLE - UNCORRECTED**

Reflectances		70	70	50	50	30	70	70	50	50	30
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	13.8	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	13.2	14.4	13.6	14.7	15.2	13.2	14.4	13.7	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	13.4	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	15.0	15.7	16.2	14.5	15.3	15.0	15.7	16.2
	8H	14.8	15.5	15.3	16.0	16.5	14.9	15.5	15.4	16.0	16.5
	12H	15.1	15.7	15.6	16.2	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	15.5	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		70	70	50	50	30	70	70	50	50	30
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	18.8	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	18.2	19.4	18.6	19.7	20.2	18.2	19.4	18.7	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	18.4	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	20.0	20.7	21.2	19.5	20.3	20.0	20.7	21.2
	8H	19.8	20.5	20.3	21.0	21.5	19.9	20.5	20.4	21.0	21.5
	12H	20.1	20.7	20.6	21.2	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	20.5	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) γ	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	1462	1462	1462	1461	1464	1463	1462	1463	1464	1461	1462	1462	1462	1462	1462	1461	1464	1463	1462
5	1455	1455	1457	1456	1456	1454	1457	1454	1456	1456	1457	1455	1455	1455	1457	1456	1456	1454	1457
10	1437	1437	1438	1437	1437	1438	1437	1437	1437	1437	1438	1437	1437	1437	1438	1437	1437	1437	1438
15	1406	1406	1408	1406	1407	1407	1407	1407	1407	1406	1408	1406	1406	1406	1408	1406	1407	1407	1407
20	1364	1363	1364	1365	1364	1364	1366	1364	1364	1365	1364	1363	1364	1363	1364	1365	1364	1364	1366
25	1307	1308	1309	1310	1310	1310	1311	1310	1310	1310	1309	1308	1307	1308	1309	1310	1310	1310	1311
30	1242	1242	1243	1244	1244	1244	1246	1244	1244	1244	1243	1242	1242	1242	1243	1244	1244	1244	1246
35	1162	1164	1166	1167	1168	1168	1171	1168	1168	1167	1166	1164	1162	1164	1166	1167	1168	1168	1171
40	1077	1078	1080	1083	1083	1082	1086	1082	1083	1083	1080	1078	1077	1078	1080	1083	1083	1082	1086
45	981	982	985	987	988	988	991	988	988	987	985	982	981	982	985	987	988	988	991
50	879	879	881	885	885	887	889	887	885	885	881	879	879	879	881	885	885	887	889
55	770	770	772	776	776	777	779	777	776	776	772	770	770	770	772	776	776	777	779
60	656	657	659	661	661	662	665	662	661	661	659	657	656	657	659	661	661	662	665
65	539	539	541	541	542	544	546	544	542	541	541	539	539	539	541	541	542	544	546
70	420	420	420	422	422	423	426	423	422	422	420	420	420	420	420	422	422	423	426
75	302	302	302	303	304	304	306	304	304	303	302	302	302	302	302	303	304	304	306
80	188	188	189	189	189	190	191	190	189	189	188	188	188	188	189	189	189	190	191
85	85.2	85.1	84.9	84.7	85.1	85.8	87.0	85.8	85.1	84.7	84.9	85.1	85.2	85.1	84.9	84.7	85.1	85.8	87.0
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) γ	285	300	315	330	345														
0	1463	1464	1461	1462	1462														
5	1454	1456	1456	1457	1455														
10	1437	1437	1437	1438	1437														
15	1407	1407	1406	1408	1406														
20	1364	1364	1365	1364	1363														
25	1310	1310	1310	1309	1308														
30	1244	1244	1244	1243	1242														
35	1168	1168	1167	1166	1164														
40	1082	1083	1083	1080	1078														
45	988	988	987	985	982														
50	887	885	885	881	879														
55	777	776	776	772	770														
60	662	661	661	659	657														
65	544	542	541	541	539														
70	423	422	422	420	420														
75	304	304	303	302	302														
80	190	189	189	189	188														
85	85.8	85.1	84.7	84.9	85.1														
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 @30W5000K	<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 <math>25 \pm 1^{\circ}\text{C}</math>. 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	0.251	30.0	0.995	7.57
277.0	60	0.109	29.5	0.977	8.44

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