

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: 2024-03-13

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

Issue Date: 2024-03-13

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

Integrated Retrofit Kits for 1x4 Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	IES LM-79-2008	1500		3825
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	132.4
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		28.9
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	9.26
			277V	8.84
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
			277V	0.983
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5103
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		84.2
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		13
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%		77.3%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	21.8
		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		0.242
(Goniophotometer – Section 4.2)		Non-Worst Case		0.105
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		28.9
(Goniophotometer – Section 4.2)		Non-Worst Case		28.5

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-03-12	RPLED1X4 @30W5000K	240306004-S1
2	Goniophotometer Test	2024-03-12	RPLED1X4 @30W5000K	240306004-S1
3	THD and PF Test	2024-03-12	RPLED1X4 @30W5000K	240306004-S1

Remark (If any)

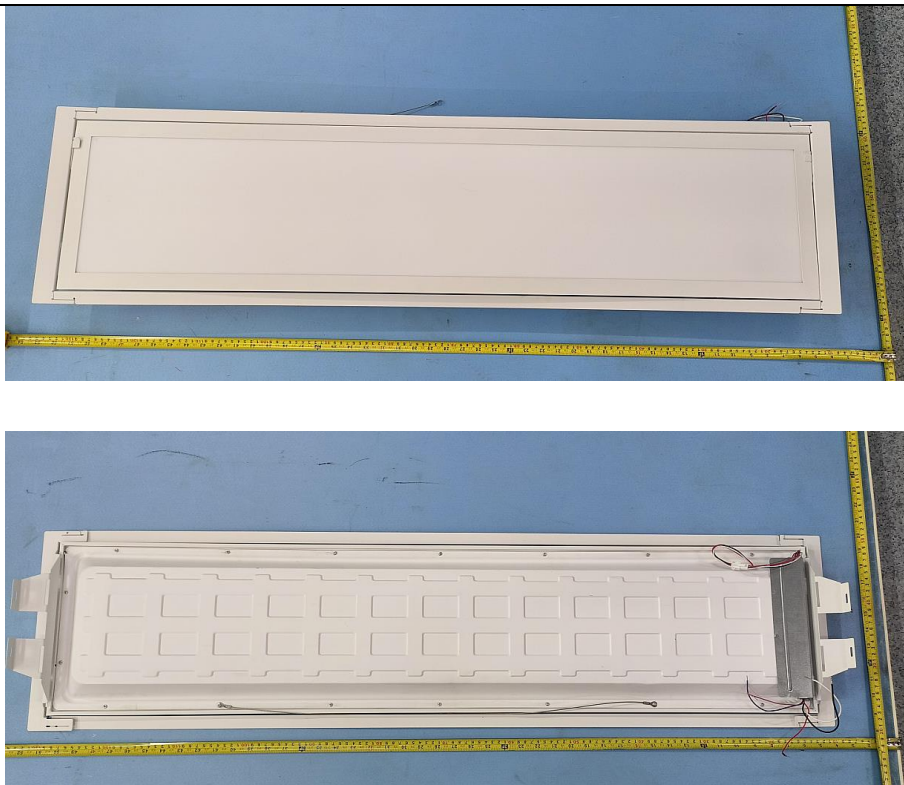
1. The results contained in this report pertain only to the tested samples.
2. Test Troffer is Lithonia GT8 lensed 1x4.
3. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
4. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

3.0 Product Description

Luminaire Description: Model No. RPLED1X4 @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

Model No.	RPLED1X4 @30W5000K	Sample ID	240306004-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

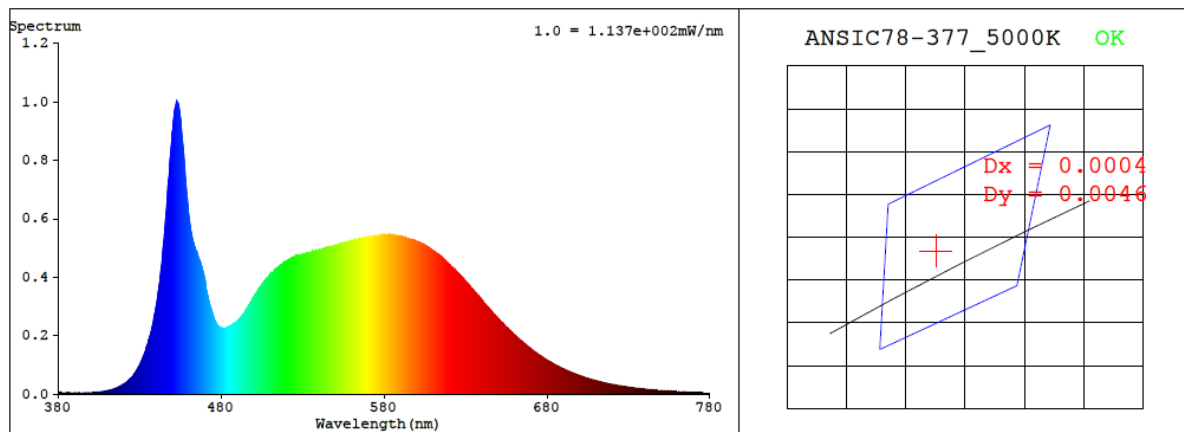
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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 4π 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	0.242	28.9	0.995
277.0	60	0.105	28.5	0.983

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5103	84.2	13	0.0022	84	95	-12%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3427$ $y = 0.3540$ / $u' = 0.2089$ $v' = 0.4855$ ($duv=2.17e-03$)

CCT= 5103K Prcp WL: $L_d=569.0nm$ Purity=9.0%

Peak WL: $L_p=453nm$ FWHM: $=19.6nm$ Ratio: $R=15.7\%$ $G=79.6\%$ $B=4.7\%$

Render Index: $R_a = 84.2$ AvgR = 77.6 TM30: $R_f=84$ $R_g=95$

EEL: 0.10078 A++ Highest

R1 =83	R2 =90	R3 =93	R4 =83	R5 =83	R6 =85	R7 =87
R8 =69	R9 =13	R10=75	R11=83	R12=61	R13=85	R14=97 R15=78

4.1 Integrating Sphere Test

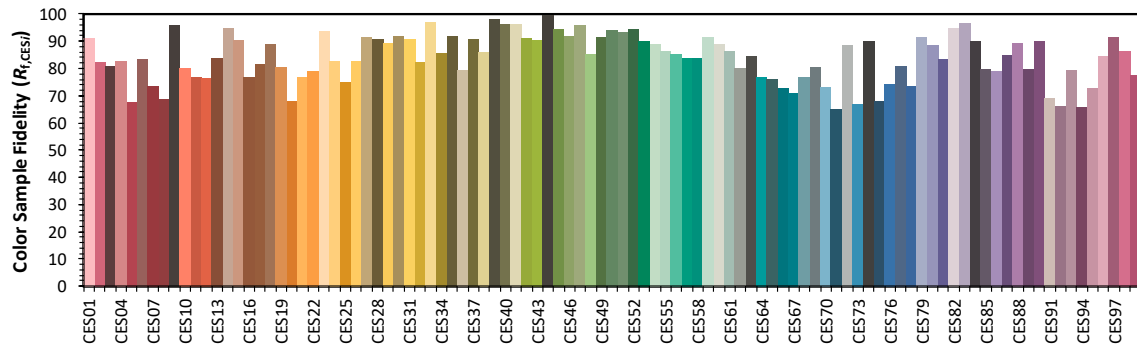
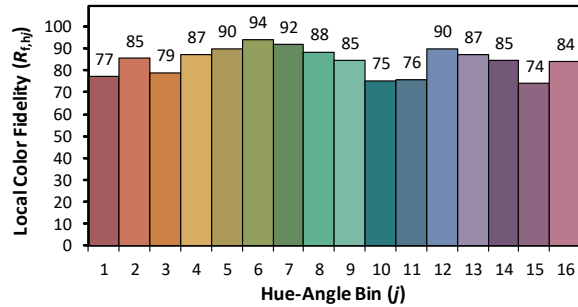
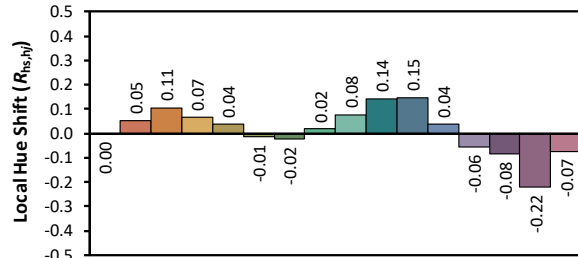
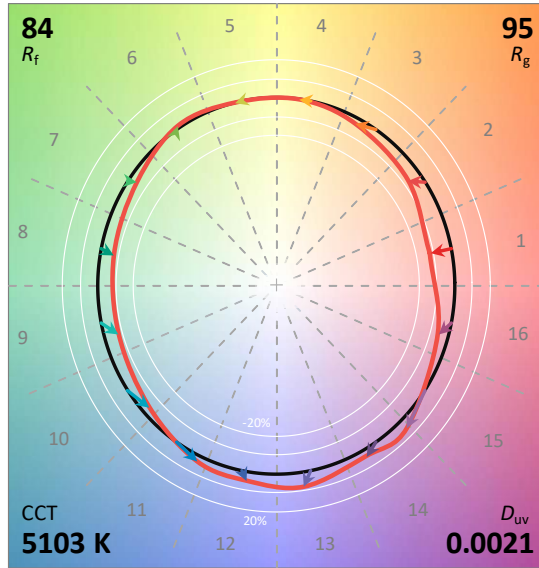
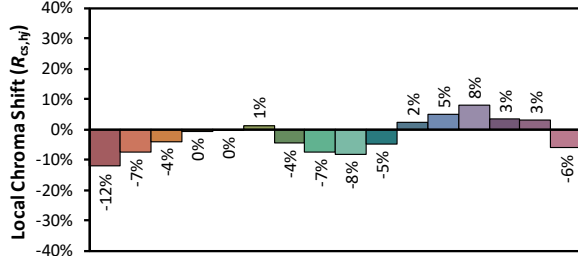
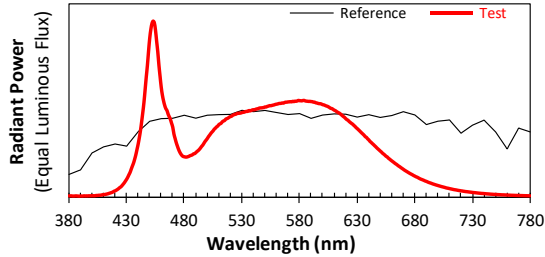
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/3/13

Model: RPLED1X4 @30W5000K



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

x 0.3426
 y 0.3538
 u' 0.2089
 v' 0.4854

CIE 13.3-1995
(CRI)

R_a 84
 R_9 13

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	4.70E-06	447	6.77E-04	514	4.29E-04	581	5.44E-04	648	2.71E-04	715	3.90E-05
381	4.60E-06	448	7.44E-04	515	4.32E-04	582	5.44E-04	649	2.65E-04	716	3.79E-05
382	4.70E-06	449	8.25E-04	516	4.40E-04	583	5.45E-04	650	2.59E-04	717	3.65E-05
383	3.70E-06	450	8.98E-04	517	4.43E-04	584	5.46E-04	651	2.53E-04	718	3.52E-05
384	3.50E-06	451	9.49E-04	518	4.46E-04	585	5.43E-04	652	2.46E-04	719	3.44E-05
385	3.90E-06	452	9.83E-04	519	4.51E-04	586	5.42E-04	653	2.41E-04	720	3.31E-05
386	4.60E-06	453	9.96E-04	520	4.54E-04	587	5.41E-04	654	2.36E-04	721	3.23E-05
387	4.00E-06	454	9.86E-04	521	4.56E-04	588	5.40E-04	655	2.29E-04	722	3.11E-05
388	3.50E-06	455	9.46E-04	522	4.61E-04	589	5.41E-04	656	2.25E-04	723	3.01E-05
389	2.90E-06	456	8.82E-04	523	4.65E-04	590	5.39E-04	657	2.18E-04	724	2.90E-05
390	3.90E-06	457	8.22E-04	524	4.67E-04	591	5.39E-04	658	2.14E-04	725	2.84E-05
391	3.70E-06	458	7.46E-04	525	4.69E-04	592	5.36E-04	659	2.08E-04	726	2.76E-05
392	3.50E-06	459	6.82E-04	526	4.73E-04	593	5.36E-04	660	2.03E-04	727	2.67E-05
393	4.80E-06	460	6.21E-04	527	4.73E-04	594	5.33E-04	661	1.98E-04	728	2.59E-05
394	4.10E-06	461	5.76E-04	528	4.74E-04	595	5.31E-04	662	1.93E-04	729	2.51E-05
395	4.50E-06	462	5.44E-04	529	4.74E-04	596	5.29E-04	663	1.88E-04	730	2.41E-05
396	4.20E-06	463	5.18E-04	530	4.77E-04	597	5.28E-04	664	1.84E-04	731	2.34E-05
397	5.00E-06	464	4.99E-04	531	4.79E-04	598	5.27E-04	665	1.78E-04	732	2.27E-05
398	4.80E-06	465	4.88E-04	532	4.79E-04	599	5.25E-04	666	1.73E-04	733	2.20E-05
399	5.20E-06	466	4.68E-04	533	4.82E-04	600	5.22E-04	667	1.69E-04	734	2.12E-05
400	5.20E-06	467	4.53E-04	534	4.84E-04	601	5.21E-04	668	1.64E-04	735	2.04E-05
401	5.50E-06	468	4.37E-04	535	4.84E-04	602	5.18E-04	669	1.60E-04	736	1.98E-05
402	5.00E-06	469	4.16E-04	536	4.89E-04	603	5.15E-04	670	1.55E-04	737	1.91E-05
403	6.20E-06	470	3.94E-04	537	4.87E-04	604	5.13E-04	671	1.51E-04	738	1.85E-05
404	7.00E-06	471	3.56E-04	538	4.89E-04	605	5.10E-04	672	1.46E-04	739	1.82E-05
405	7.20E-06	472	3.31E-04	539	4.92E-04	606	5.05E-04	673	1.43E-04	740	1.75E-05
406	8.20E-06	473	3.07E-04	540	4.93E-04	607	5.01E-04	674	1.38E-04	741	1.70E-05
407	8.30E-06	474	2.87E-04	541	4.93E-04	608	5.00E-04	675	1.34E-04	742	1.63E-05
408	9.30E-06	475	2.69E-04	542	4.96E-04	609	4.95E-04	676	1.31E-04	743	1.59E-05
409	1.08E-05	476	2.54E-04	543	4.98E-04	610	4.91E-04	677	1.27E-04	744	1.54E-05
410	1.15E-05	477	2.42E-04	544	4.99E-04	611	4.88E-04	678	1.24E-04	745	1.48E-05
411	1.25E-05	478	2.34E-04	545	5.02E-04	612	4.83E-04	679	1.20E-04	746	1.42E-05
412	1.38E-05	479	2.28E-04	546	5.03E-04	613	4.79E-04	680	1.17E-04	747	1.39E-05
413	1.53E-05	480	2.26E-04	547	5.04E-04	614	4.75E-04	681	1.13E-04	748	1.32E-05
414	1.71E-05	481	2.25E-04	548	5.05E-04	615	4.71E-04	682	1.10E-04	749	1.30E-05
415	1.93E-05	482	2.25E-04	549	5.06E-04	616	4.66E-04	683	1.07E-04	750	1.26E-05
416	2.14E-05	483	2.27E-04	550	5.09E-04	617	4.60E-04	684	1.03E-04	751	1.23E-05
417	2.37E-05	484	2.29E-04	551	5.09E-04	618	4.54E-04	685	9.99E-05	752	1.19E-05
418	2.63E-05	485	2.33E-04	552	5.12E-04	619	4.50E-04	686	9.74E-05	753	1.15E-05
419	3.06E-05	486	2.35E-04	553	5.14E-04	620	4.43E-04	687	9.48E-05	754	1.12E-05
420	3.30E-05	487	2.37E-04	554	5.16E-04	621	4.37E-04	688	9.19E-05	755	1.07E-05
421	3.67E-05	488	2.43E-04	555	5.16E-04	622	4.33E-04	689	8.88E-05	756	1.04E-05
422	4.09E-05	489	2.44E-04	556	5.18E-04	623	4.26E-04	690	8.67E-05	757	1.03E-05
423	4.57E-05	490	2.50E-04	557	5.19E-04	624	4.21E-04	691	8.36E-05	758	9.90E-06
424	5.15E-05	491	2.56E-04	558	5.21E-04	625	4.16E-04	692	8.08E-05	759	9.60E-06
425	5.59E-05	492	2.61E-04	559	5.23E-04	626	4.11E-04	693	7.86E-05	760	9.20E-06
426	6.28E-05	493	2.68E-04	560	5.25E-04	627	4.05E-04	694	7.64E-05	761	9.00E-06
427	7.08E-05	494	2.76E-04	561	5.26E-04	628	3.99E-04	695	7.38E-05	762	8.60E-06
428	7.90E-05	495	2.85E-04	562	5.28E-04	629	3.92E-04	696	7.14E-05	763	8.40E-06
429	8.90E-05	496	2.92E-04	563	5.29E-04	630	3.86E-04	697	6.94E-05	764	8.00E-06
430	9.89E-05	497	3.03E-04	564	5.29E-04	631	3.80E-04	698	6.72E-05	765	7.90E-06
431	1.11E-04	498	3.13E-04	565	5.32E-04	632	3.74E-04	699	6.52E-05	766	7.60E-06
432	1.25E-04	499	3.21E-04	566	5.31E-04	633	3.67E-04	700	6.33E-05	767	7.30E-06
433	1.38E-04	500	3.30E-04	567	5.34E-04	634	3.61E-04	701	6.13E-05	768	7.20E-06
434	1.57E-04	501	3.41E-04	568	5.36E-04	635	3.55E-04	702	5.94E-05	769	7.00E-06
435	1.74E-04	502	3.49E-04	569	5.36E-04	636	3.48E-04	703	5.74E-05	770	6.70E-06
436	1.91E-04	503	3.59E-04	570	5.37E-04	637	3.40E-04	704	5.58E-05	771	6.50E-06
437	2.13E-04	504	3.66E-04	571	5.38E-04	638	3.36E-04	705	5.40E-05	772	6.30E-06
438	2.38E-04	505	3.73E-04	572	5.39E-04	639	3.28E-04	706	5.23E-05	773	6.20E-06
439	2.68E-04	506	3.83E-04	573	5.38E-04	640	3.22E-04	707	5.02E-05	774	5.90E-06
440	2.98E-04	507	3.89E-04	574	5.41E-04	641	3.14E-04	708	4.87E-05	775	5.70E-06
441	3.35E-04	508	3.96E-04	575	5.39E-04	642	3.08E-04	709	4.75E-05	776	5.50E-06
442	3.75E-04	509	4.01E-04	576	5.42E-04	643	3.02E-04	710	4.58E-05	777	5.50E-06
443	4.24E-04	510	4.09E-04	577	5.41E-04	644	2.96E-04	711	4.44E-05	778	5.20E-06
444	4.77E-04	511	4.13E-04	578	5.43E-04	645	2.90E-04	712	4.30E-05	779	5.20E-06
445	5.34E-04	512	4.17E-04	579	5.46E-04	646	2.83E-04	713	4.15E-05	780	5.20E-06
446	6.05E-04	513	4.25E-04	580	5.44E-04	647	2.77E-04	714	4.00E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	RPLED1X4 @30W5000K	Sample ID	240306004-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	42.4

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 $25 \pm 1^{\circ}\text{C}$, 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 ± 0.2 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 1.0° vertical intervals and 15° horizontal intervals.</p>

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.242	28.9	0.995
NON-WORST CASE	277.0	60	0.105	28.5	0.983

Test Result

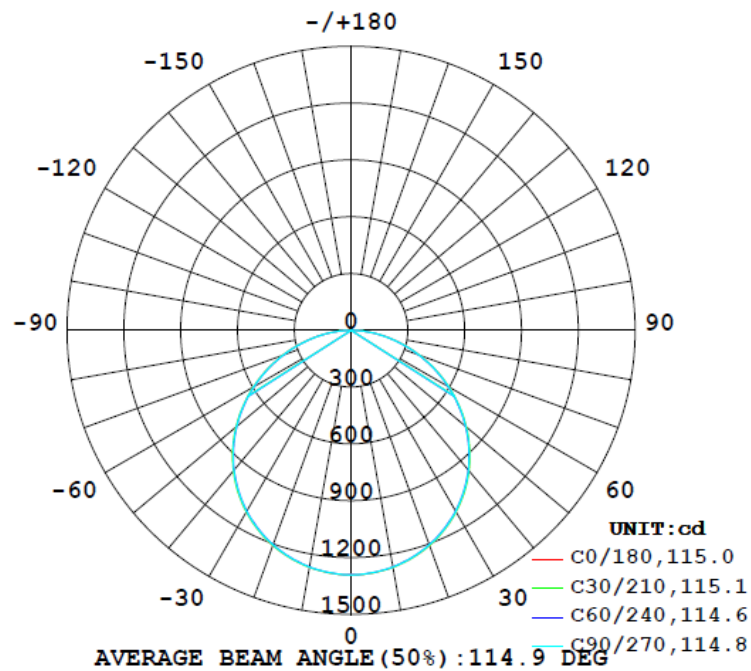
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement
	C0-180	C90-270	C0-180	C90-270		(0° - 60°)
3825	165.5	165.1	114.9	114.8	132.4	77.3%

UGR		Spacing Criterion	
Crosswise	Endwise	(0° - 180°)	(90° - 270°)
21.8	21.7	1.28	1.28

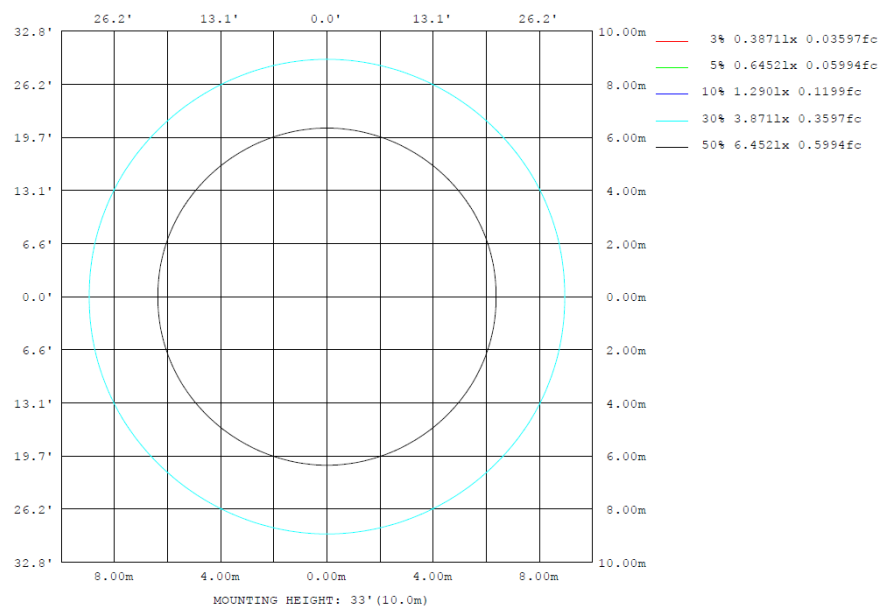
4.2 Goniophotometer Test

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	lum, lamp
10	1270	1268	1269	1268	1270	1268	1269	1268	0- 10	122.2	122.2	3.19,3.19
20	1209	1205	1205	1205	1209	1205	1205	1205	10- 20	350.8	473.0	12.4,12.4
30	1106	1103	1104	1103	1106	1103	1104	1103	20- 30	534.9	1008	26.4,26.4
40	965.4	963.7	963.5	963.7	965.4	963.7	963.5	963.7	30- 40	650.0	1658	43.3,43.3
50	791.8	790.2	790.4	790.2	791.8	790.2	790.4	790.2	40- 50	679.9	2338	61.1,61.1
60	594.8	591.1	592.5	591.1	594.8	591.1	592.5	591.1	50- 60	620.5	2958	77.3,77.3
70	385.4	380.1	382.1	380.1	385.4	380.1	382.1	380.1	60- 70	482.8	3441	90.90
80	179.3	174.7	175.1	174.7	179.3	174.7	175.1	174.7	70- 80	292.8	3734	97.6,97.6
90	0	0	0	0	0	0	0	0	80- 90	90.78	3825	100,100
100	0	0	0	0	0	0	0	0	90-100	0	3825	100,100
110	0	0	0	0	0	0	0	0	100-110	0	3825	100,100
120	0	0	0	0	0	0	0	0	110-120	0	3825	100,100
130	0	0	0	0	0	0	0	0	120-130	0	3825	100,100
140	0	0	0	0	0	0	0	0	130-140	0	3825	100,100
150	0	0	0	0	0	0	0	0	140-150	0	3825	100,100
160	0	0	0	0	0	0	0	0	150-160	0	3825	100,100
170	0	0	0	0	0	0	0	0	160-170	0	3825	100,100
180	0	0	0	0	0	0	0	0	170-180	0	3825	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	122.15	0-10	122.15	3.19%
10-20	350.83	0-20	472.98	12.37%
20-30	534.93	0-30	1007.91	26.35%
30-40	650.02	0-40	1657.93	43.35%
40-50	679.88	0-50	2337.81	61.12%
50-60	620.47	0-60	2958.28	77.35%
60-70	482.78	0-70	3441.06	89.97%
70-80	292.84	0-80	3733.90	97.63%
80-90	90.78	0-90	3824.68	100.00%
90-100	0.00	0-100	3824.68	100.00%
100-110	0.00	0-110	3824.68	100.00%
110-120	0.00	0-120	3824.68	100.00%
120-130	0.00	0-130	3824.68	100.00%
130-140	0.00	0-140	3824.68	100.00%
140-150	0.00	0-150	3824.68	100.00%
150-160	0.00	0-160	3824.68	100.00%
160-170	0.00	0-170	3824.68	100.00%
170-180	0.00	0-180	3824.68	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										
X=2H	Y=2H	12.4	14.1	12.8	14.4	14.7	12.3	14.0	12.7	14.3
	3H	14.3	15.8	14.7	16.2	16.5	14.2	15.7	14.6	16.1
	4H	15.1	16.5	15.5	16.8	17.2	15.0	16.4	15.4	16.8
	6H	15.7	17.0	16.1	17.4	17.7	15.6	16.9	16.0	17.3
	8H	15.9	17.2	16.3	17.5	17.9	15.8	17.0	16.2	17.4
	12H	16.0	17.3	16.5	17.6	18.1	15.9	17.1	16.4	17.5
UGR Viewed Endwise										
		12.3	14.0	12.7	14.3	14.6	14.2	15.7	14.6	16.1
		14.3	15.8	14.7	16.2	16.5	15.0	16.4	15.4	16.8
		15.1	16.5	15.5	16.8	17.2	15.6	16.9	16.0	17.3
		15.7	17.0	16.1	17.4	17.7	15.8	17.0	16.2	17.4
		15.9	17.2	16.3	17.5	17.9	15.9	17.1	16.4	17.5
		16.0	17.3	16.5	17.6	18.1	15.9	17.1	16.4	17.5
4H	2H	13.1	14.5	13.4	14.8	15.2	13.0	14.4	13.4	14.8
	3H	15.2	16.4	15.6	16.8	17.2	15.1	16.3	15.5	16.7
	4H	16.1	17.2	16.5	17.6	18.0	16.0	17.1	16.5	17.5
	6H	16.8	17.8	17.3	18.2	18.7	16.7	17.7	17.2	18.1
	8H	17.1	18.0	17.6	18.4	18.9	17.0	17.9	17.5	18.3
	12H	17.3	18.1	17.8	18.6	19.1	17.2	18.0	17.7	18.5
8H	4H	16.4	17.3	16.9	17.8	18.2	16.4	17.3	16.8	17.7
	6H	17.3	18.1	17.8	18.6	19.0	17.2	18.0	17.7	18.5
	8H	17.7	18.4	18.2	18.9	19.3	17.6	18.3	18.1	18.8
	12H	18.0	18.6	18.5	19.1	19.6	17.9	18.5	18.4	19.0
12H	4H	16.5	17.3	17.0	17.8	18.2	16.4	17.2	16.9	17.7
	6H	17.4	18.1	17.9	18.6	19.1	17.3	18.0	17.9	18.5
	8H	17.8	18.4	18.3	18.9	19.5	17.7	18.3	18.2	18.8

Maximum UGR = 19.6

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										
X=2H	Y=2H	17.1	18.8	17.5	19.1	19.4	17.0	18.7	17.4	19.0
	3H	19.0	20.5	19.4	20.9	21.2	18.9	20.4	19.3	20.8
	4H	19.8	21.2	20.2	21.5	21.9	19.7	21.1	20.1	21.5
	6H	20.4	21.7	20.8	22.1	22.4	20.3	21.6	20.7	22.0
	8H	20.6	21.9	21.0	22.2	22.6	20.5	21.7	20.9	22.1
	12H	20.7	22.0	21.2	22.3	22.8	20.6	21.8	21.1	22.2
UGR Viewed Endwise										
		17.0	18.7	17.4	19.0	19.3	18.9	20.4	19.3	20.8
		19.0	20.5	19.4	20.9	21.2	19.7	21.1	20.1	21.5
		19.8	21.2	20.2	21.5	21.9	19.7	21.1	20.1	21.5
		20.4	21.7	20.8	22.1	22.4	20.3	21.6	20.7	22.0
		20.6	21.9	21.0	22.2	22.6	20.5	21.7	20.9	22.1
		20.7	22.0	21.2	22.3	22.8	20.6	21.8	21.1	22.2
4H	2H	17.8	19.2	18.1	19.5	19.9	17.7	19.1	18.1	19.5
	3H	19.9	21.1	20.3	21.5	21.9	19.8	21.0	20.2	21.4
	4H	20.8	21.9	21.2	22.3	22.7	20.7	21.8	21.2	22.2
	6H	21.5	22.5	22.0	22.9	23.4	21.4	22.4	21.9	22.8
	8H	21.8	22.7	22.3	23.1	23.6	21.7	22.6	22.2	23.0
	12H	22.0	22.8	22.5	23.3	23.8	21.9	22.7	22.4	23.2
8H	4H	21.1	22.0	21.6	22.5	22.9	21.1	22.0	21.5	22.4
	6H	22.0	22.8	22.5	23.3	23.7	21.9	22.7	22.4	23.2
	8H	22.4	23.1	22.9	23.6	24.0	22.3	23.0	22.8	23.5
	12H	22.7	23.3	23.2	23.8	24.3	22.6	23.2	23.1	23.7
12H	4H	21.2	22.0	21.7	22.5	22.9	21.1	21.9	21.6	22.4
	6H	22.1	22.8	22.6	23.3	23.8	22.0	22.7	22.6	23.2
	8H	22.5	23.1	23.0	23.6	24.2	22.4	23.0	22.9	23.5

Maximum UGR = 24.3

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	1290	1291	1292	1291	1291	1291	1292	1291	1291	1291	1292	1291	1290	1291	1292	1291	1291	1291	1292
5	1286	1285	1286	1285	1284	1284	1284	1284	1284	1285	1286	1285	1286	1285	1286	1285	1284	1284	1284
10	1270	1270	1270	1268	1268	1268	1269	1268	1268	1268	1270	1270	1270	1270	1270	1268	1268	1268	1269
15	1244	1245	1245	1241	1241	1241	1242	1241	1241	1241	1245	1245	1244	1245	1245	1241	1241	1241	1242
20	1209	1211	1209	1205	1204	1204	1205	1204	1204	1205	1209	1211	1209	1211	1209	1205	1204	1204	1205
25	1162	1165	1163	1159	1158	1157	1159	1157	1158	1159	1163	1165	1162	1165	1163	1159	1158	1157	1159
30	1106	1109	1107	1103	1103	1102	1104	1102	1103	1103	1107	1109	1106	1109	1107	1103	1103	1102	1104
35	1041	1043	1043	1038	1036	1036	1038	1036	1036	1038	1043	1043	1041	1043	1043	1038	1036	1036	1038
40	965	968	968	964	962	962	963	962	962	964	968	968	965	968	968	964	962	962	963
45	883	885	885	880	878	878	882	878	878	880	885	885	883	885	885	880	878	878	882
50	792	794	794	790	788	788	790	788	788	790	794	794	792	794	794	790	788	788	790
55	696	698	698	692	691	691	695	691	691	692	698	698	696	698	698	692	691	691	695
60	595	597	596	591	590	590	593	590	590	591	596	597	595	597	596	591	590	590	593
65	491	493	491	486	485	486	488	486	485	486	491	493	491	493	491	486	485	486	488
70	385	386	384	380	379	379	382	379	379	380	384	386	385	386	384	380	379	379	382
75	281	280	279	276	274	274	276	274	274	276	279	280	281	280	279	276	274	274	276
80	179	179	177	175	174	174	175	174	174	175	177	179	179	179	177	175	174	174	175
85	84.8	83.8	82.5	80.9	80.1	80.1	80.8	80.1	80.1	80.9	82.5	83.8	84.8	83.8	82.5	80.9	80.1	80.1	80.8
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	1291	1291	1291	1292	1291														
5	1284	1284	1285	1286	1285														
10	1268	1268	1268	1270	1270														
15	1241	1241	1241	1245	1245														
20	1204	1204	1205	1209	1211														
25	1157	1158	1159	1163	1165														
30	1102	1103	1103	1107	1109														
35	1036	1036	1038	1043	1043														
40	962	962	964	968	968														
45	878	878	880	885	885														
50	788	788	790	794	794														
55	691	691	692	698	698														
60	590	590	591	596	597														
65	486	485	486	491	493														
70	379	379	380	384	386														
75	274	274	276	279	280														
80	174	174	175	177	179														
85	80.1	80.1	80.9	82.5	83.8														
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

Model No.	RPLED1X4 @30W5000K	Sample ID	240306004-S1
Temperature (°C)	25.4	Humidity (%RH)	41.0

Test Method
<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 $25 \pm 1^\circ\text{C}$. 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	0.242	28.9	0.995	9.26
277.0	60	0.105	28.5	0.983	8.84

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*****