

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

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Issue Date: 2024-03-04

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	IES LM-79-2008	3000		2830
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	138.7
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		20.4
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	8.91
			277V	10.24
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.994
			277V	0.904
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3465±245	3481
		4 steps	3465±124	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		84.8
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		16
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		86
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%		-11%
Zonal Lumen Requirement (0°-60°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≥75%		74.0%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	20.0
		N/A	<22	
Spacing Criterion (Goniophotometer – Section 4.2)	IES LM-79-2008	0°-180°	1.0-2.0	1.24
		90°-270°	1.0-2.0	1.30
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		277.0
(Goniophotometer – Section 4.2)		Non-Worst Case		120.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.081
(Goniophotometer – Section 4.2)		Non-Worst Case		0.169
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		20.4
(Goniophotometer – Section 4.2)		Non-Worst Case		20.2

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-03-01	C-SWISH2X4@20W3500K	240301001-S1
2	Goniophotometer Test	2024-03-01	C-SWISH2X4@20W3500K	240301001-S1
3	THD and PF Test	2024-03-01	C-SWISH2X4@20W3500K	240301001-S1

Remark (If any)

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

3.0 Product Description

Luminaire Description: Model No. C-SWISH2X4@20W3500K, 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.	C-SWISH2X4@20W3500K	Sample ID	240301001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

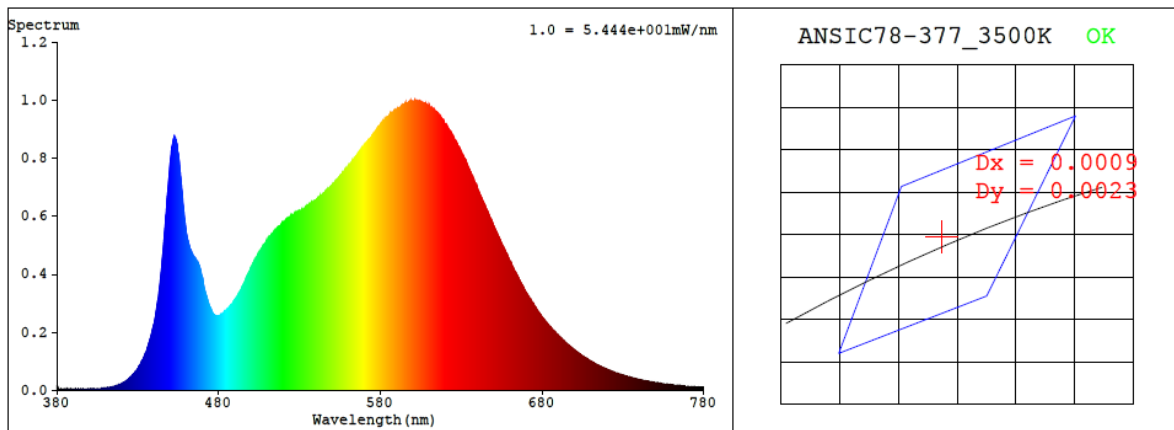
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25 \pm 1^\circ\text{C}$.</p> <p>The sample measurements 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	0.169	20.2	0.994
277.0	60	0.081	20.4	0.904

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3481	84.8	16	0.0008	86	95	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4073$ $y = 0.3936$ / $u' = 0.2358$ $v' = 0.5128$ ($duv=8.33e-04$)

CCT= 3481K Prcp WL: $L_d=580.6nm$ Purity=40.4%

Peak WL: $L_p=601nm$ FWHM: $=149.2nm$ Ratio:R=20.6% G=76.1% B=3.3%

Render Index: $R_a = 84.8$ AvgR = 79.1 TM30:Rf=86 Rg=95

EEL: 0.09389 A++ Highest

R1 =84 R2 =92 R3 =97 R4 =83 R5 =83 R6 =89 R7 =86

R8 =65 R9 =16 R10=81 R11=83 R12=67 R13=86 R14=99 R15=77

4.1 Integrating Sphere Test

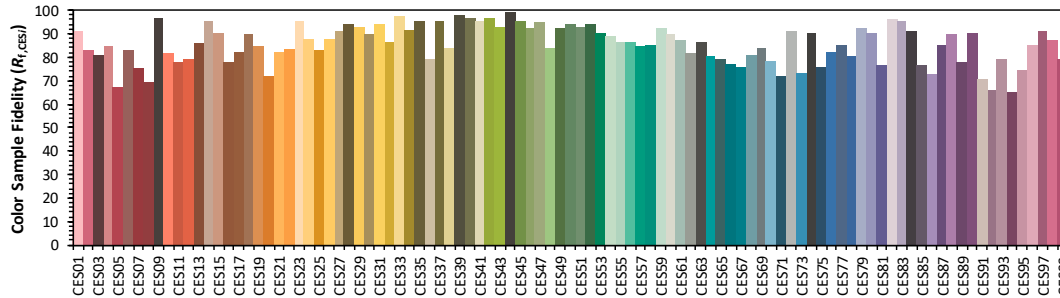
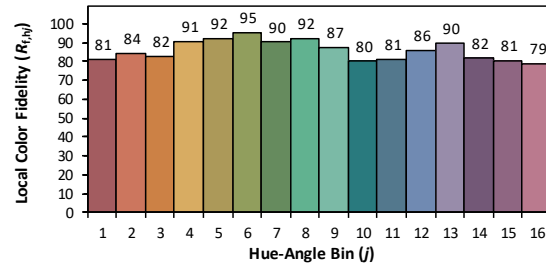
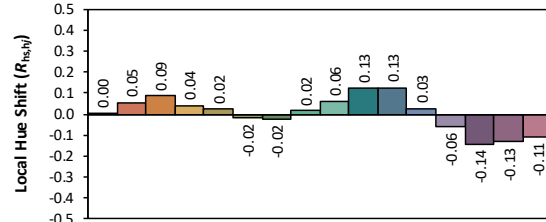
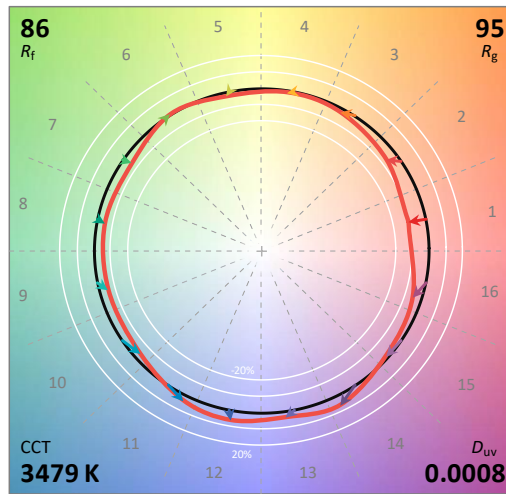
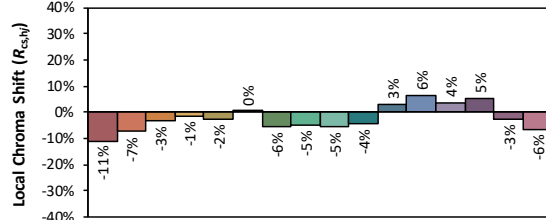
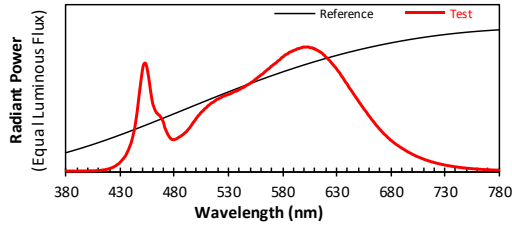
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/3/4

Model: C-SWISH2X4@20W3500K



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

x 0.4073
 y 0.3935
 u' 0.2359
 v' 0.5127

CIE 13.3-1995
(CRI)

R_a 85
 R_g 16

4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	5.40E-06	447	5.86E-04	514	5.47E-04	581	9.22E-04	648	5.92E-04	715	8.56E-05
381	2.10E-06	448	6.56E-04	515	5.52E-04	582	9.31E-04	649	5.82E-04	716	8.31E-05
382	3.60E-06	449	7.24E-04	516	5.55E-04	583	9.36E-04	650	5.67E-04	717	7.97E-05
383	4.00E-06	450	7.86E-04	517	5.64E-04	584	9.40E-04	651	5.55E-04	718	7.76E-05
384	3.70E-06	451	8.41E-04	518	5.68E-04	585	9.44E-04	652	5.43E-04	719	7.57E-05
385	4.00E-06	452	8.64E-04	519	5.76E-04	586	9.53E-04	653	5.30E-04	720	7.29E-05
386	4.50E-06	453	8.69E-04	520	5.79E-04	587	9.57E-04	654	5.18E-04	721	7.05E-05
387	3.50E-06	454	8.53E-04	521	5.82E-04	588	9.59E-04	655	5.05E-04	722	6.82E-05
388	3.30E-06	455	8.14E-04	522	5.90E-04	589	9.66E-04	656	4.93E-04	723	6.59E-05
389	2.50E-06	456	7.64E-04	523	5.91E-04	590	9.67E-04	657	4.83E-04	724	6.40E-05
390	3.30E-06	457	7.05E-04	524	5.97E-04	591	9.73E-04	658	4.72E-04	725	6.18E-05
391	3.90E-06	458	6.43E-04	525	6.04E-04	592	9.75E-04	659	4.58E-04	726	5.98E-05
392	2.90E-06	459	5.89E-04	526	6.04E-04	593	9.79E-04	660	4.46E-04	727	5.78E-05
393	5.10E-06	460	5.43E-04	527	6.10E-04	594	9.84E-04	661	4.36E-04	728	5.60E-05
394	3.60E-06	461	5.18E-04	528	6.11E-04	595	9.84E-04	662	4.23E-04	729	5.41E-05
395	3.50E-06	462	4.94E-04	529	6.15E-04	596	9.87E-04	663	4.11E-04	730	5.19E-05
396	5.30E-06	463	4.78E-04	530	6.18E-04	597	9.90E-04	664	4.02E-04	731	5.07E-05
397	3.50E-06	464	4.67E-04	531	6.19E-04	598	9.93E-04	665	3.91E-04	732	4.90E-05
398	3.80E-06	465	4.58E-04	532	6.24E-04	599	9.97E-04	666	3.79E-04	733	4.70E-05
399	5.30E-06	466	4.51E-04	533	6.27E-04	600	9.97E-04	667	3.69E-04	734	4.62E-05
400	4.10E-06	467	4.41E-04	534	6.33E-04	601	9.96E-04	668	3.59E-04	735	4.44E-05
401	5.40E-06	468	4.27E-04	535	6.37E-04	602	9.96E-04	669	3.47E-04	736	4.27E-05
402	5.70E-06	469	4.10E-04	536	6.41E-04	603	9.97E-04	670	3.38E-04	737	4.13E-05
403	5.60E-06	470	3.90E-04	537	6.43E-04	604	9.98E-04	671	3.29E-04	738	4.02E-05
404	5.00E-06	471	3.55E-04	538	6.46E-04	605	9.93E-04	672	3.19E-04	739	3.84E-05
405	5.70E-06	472	3.34E-04	539	6.52E-04	606	9.92E-04	673	3.11E-04	740	3.75E-05
406	5.90E-06	473	3.14E-04	540	6.55E-04	607	9.90E-04	674	3.01E-04	741	3.66E-05
407	5.80E-06	474	2.96E-04	541	6.62E-04	608	9.89E-04	675	2.93E-04	742	3.49E-05
408	7.20E-06	475	2.82E-04	542	6.66E-04	609	9.82E-04	676	2.86E-04	743	3.38E-05
409	7.90E-06	476	2.69E-04	543	6.73E-04	610	9.83E-04	677	2.76E-04	744	3.33E-05
410	7.70E-06	477	2.61E-04	544	6.73E-04	611	9.75E-04	678	2.68E-04	745	3.19E-05
411	8.80E-06	478	2.56E-04	545	6.80E-04	612	9.73E-04	679	2.61E-04	746	3.06E-05
412	9.40E-06	479	2.56E-04	546	6.86E-04	613	9.68E-04	680	2.52E-04	747	2.94E-05
413	1.11E-05	480	2.55E-04	547	6.93E-04	614	9.61E-04	681	2.46E-04	748	2.86E-05
414	1.24E-05	481	2.59E-04	548	6.95E-04	615	9.58E-04	682	2.39E-04	749	2.81E-05
415	1.28E-05	482	2.62E-04	549	7.01E-04	616	9.52E-04	683	2.32E-04	750	2.69E-05
416	1.48E-05	483	2.67E-04	550	7.05E-04	617	9.45E-04	684	2.25E-04	751	2.60E-05
417	1.70E-05	484	2.74E-04	551	7.14E-04	618	9.35E-04	685	2.19E-04	752	2.50E-05
418	1.86E-05	485	2.78E-04	552	7.18E-04	619	9.29E-04	686	2.13E-04	753	2.47E-05
419	2.05E-05	486	2.84E-04	553	7.23E-04	620	9.18E-04	687	2.07E-04	754	2.37E-05
420	2.32E-05	487	2.90E-04	554	7.31E-04	621	9.12E-04	688	2.01E-04	755	2.29E-05
421	2.66E-05	488	2.96E-04	555	7.40E-04	622	9.02E-04	689	1.95E-04	756	2.19E-05
422	2.95E-05	489	3.04E-04	556	7.44E-04	623	8.94E-04	690	1.90E-04	757	2.17E-05
423	3.39E-05	490	3.12E-04	557	7.52E-04	624	8.85E-04	691	1.84E-04	758	2.08E-05
424	3.71E-05	491	3.17E-04	558	7.60E-04	625	8.74E-04	692	1.79E-04	759	2.02E-05
425	4.27E-05	492	3.29E-04	559	7.65E-04	626	8.63E-04	693	1.73E-04	760	1.94E-05
426	4.76E-05	493	3.40E-04	560	7.73E-04	627	8.54E-04	694	1.68E-04	761	1.89E-05
427	5.44E-05	494	3.49E-04	561	7.77E-04	628	8.42E-04	695	1.63E-04	762	1.82E-05
428	5.96E-05	495	3.61E-04	562	7.84E-04	629	8.34E-04	696	1.57E-04	763	1.78E-05
429	6.68E-05	496	3.73E-04	563	7.93E-04	630	8.23E-04	697	1.53E-04	764	1.73E-05
430	7.54E-05	497	3.87E-04	564	8.00E-04	631	8.10E-04	698	1.49E-04	765	1.66E-05
431	8.57E-05	498	3.99E-04	565	8.08E-04	632	7.99E-04	699	1.44E-04	766	1.61E-05
432	9.51E-05	499	4.09E-04	566	8.16E-04	633	7.89E-04	700	1.39E-04	767	1.56E-05
433	1.05E-04	500	4.23E-04	567	8.23E-04	634	7.73E-04	701	1.35E-04	768	1.50E-05
434	1.17E-04	501	4.35E-04	568	8.28E-04	635	7.61E-04	702	1.31E-04	769	1.45E-05
435	1.29E-04	502	4.46E-04	569	8.38E-04	636	7.49E-04	703	1.26E-04	770	1.44E-05
436	1.47E-04	503	4.55E-04	570	8.45E-04	637	7.35E-04	704	1.23E-04	771	1.38E-05
437	1.65E-04	504	4.66E-04	571	8.51E-04	638	7.21E-04	705	1.18E-04	772	1.34E-05
438	1.85E-04	505	4.76E-04	572	8.58E-04	639	7.09E-04	706	1.15E-04	773	1.31E-05
439	2.08E-04	506	4.83E-04	573	8.65E-04	640	6.99E-04	707	1.12E-04	774	1.24E-05
440	2.31E-04	507	4.92E-04	574	8.69E-04	641	6.82E-04	708	1.08E-04	775	1.22E-05
441	2.62E-04	508	5.02E-04	575	8.79E-04	642	6.69E-04	709	1.05E-04	776	1.17E-05
442	2.99E-04	509	5.09E-04	576	8.87E-04	643	6.57E-04	710	1.01E-04	777	1.14E-05
443	3.36E-04	510	5.15E-04	577	8.92E-04	644	6.44E-04	711	9.79E-05	778	1.10E-05
444	3.87E-04	511	5.26E-04	578	8.99E-04	645	6.32E-04	712	9.40E-05	779	1.10E-05
445	4.45E-04	512	5.31E-04	579	9.10E-04	646	6.18E-04	713	9.17E-05	780	1.10E-05
446	5.10E-04	513	5.39E-04	580	9.16E-04	647	6.06E-04	714	8.86E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	C-SWISH2X4@20W3500K	Sample ID	240301001-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	24.9	Humidity (%RH)	43.8

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	277.0	60	0.081	20.4	0.904
NON-WORST CASE	120.0	60	0.169	20.2	0.994

Test Result

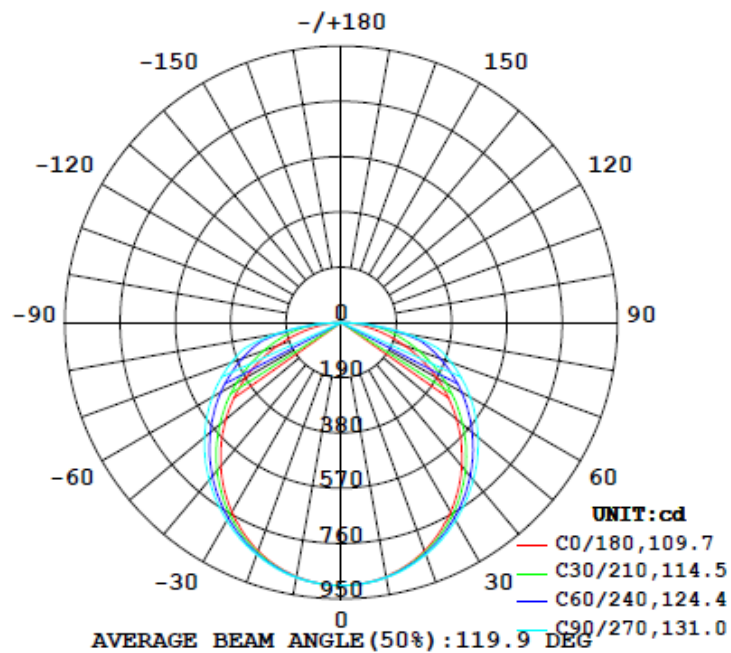
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement
	C0-180	C90-270	C0-180	C90-270		(0°-60°)
2830	161.1	170.6	109.8	130.9	138.7	74.0%

UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
16.8	20.0	1.24	1.30

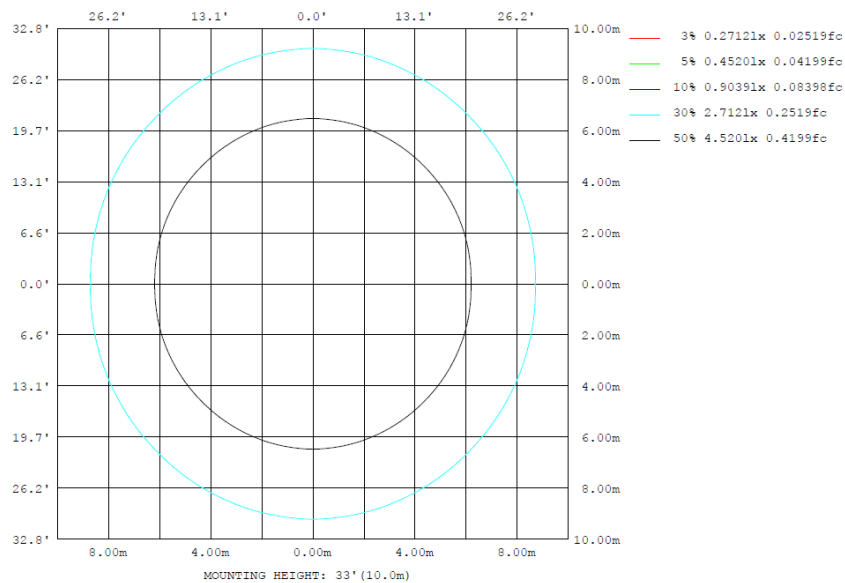
4.2 Goniophotometer Test

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	886.9	888.7	890.0	888.7	886.9	888.7	890.0	888.7	0- 10	85.57	85.57	3.02,3.02
20	835.1	843.1	849.5	843.1	835.1	843.1	849.5	843.1	10- 20	245.4	331.0	11.7,11.7
30	752.5	770.9	786.9	770.9	752.5	770.9	786.9	770.9	20- 30	373.3	704.3	24.9,24.9
40	644.9	675.3	706.2	675.3	644.9	675.3	706.2	675.3	30- 40	454.3	1159	40.9,40.9
50	518.3	565.4	614.1	565.4	518.3	565.4	614.1	565.4	40- 50	481.0	1640	57.9,57.9
60	379.1	446.2	511.7	446.2	379.1	446.2	511.7	446.2	50- 60	453.7	2093	74,74
70	231.0	324.4	402.7	324.4	231.0	324.4	402.7	324.4	60- 70	380.0	2473	87.4,87.4
80	89.39	197.3	228.0	197.3	89.39	197.3	228.0	197.3	70- 80	268.9	2742	96.9,96.9
90	0	0	0	0	0	0	0	0	80- 90	88.33	2830	100,100
100	0	0	0	0	0	0	0	0	90-100	0	2830	100,100
110	0	0	0	0	0	0	0	0	100-110	0	2830	100,100
120	0	0	0	0	0	0	0	0	110-120	0	2830	100,100
130	0	0	0	0	0	0	0	0	120-130	0	2830	100,100
140	0	0	0	0	0	0	0	0	130-140	0	2830	100,100
150	0	0	0	0	0	0	0	0	140-150	0	2830	100,100
160	0	0	0	0	0	0	0	0	150-160	0	2830	100,100
170	0	0	0	0	0	0	0	0	160-170	0	2830	100,100
180	0	0	0	0	0	0	0	0	170-180	0	2830	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	85.57	0-10	85.57	3.02%
10-20	245.43	0-20	331.00	11.69%
20-30	373.32	0-30	704.32	24.88%
30-40	454.28	0-40	1158.60	40.93%
40-50	480.97	0-50	1639.57	57.93%
50-60	453.70	0-60	2093.27	73.95%
60-70	379.98	0-70	2473.25	87.38%
70-80	268.91	0-80	2742.16	96.88%
80-90	88.33	0-90	2830.49	100.00%
90-100	0.00	0-100	2830.49	100.00%
100-110	0.00	0-110	2830.49	100.00%
110-120	0.00	0-120	2830.49	100.00%
120-130	0.00	0-130	2830.49	100.00%
130-140	0.00	0-140	2830.49	100.00%
140-150	0.00	0-150	2830.49	100.00%
150-160	0.00	0-160	2830.49	100.00%
160-170	0.00	0-170	2830.49	100.00%
170-180	0.00	0-180	2830.49	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	8.6	10.3	8.9	10.6	10.9	9.9	11.6	10.3	11.9	12.2
	3H	10.4	11.9	10.7	12.2	12.6	12.5	14.1	12.9	14.4	14.7
	4H	11.0	12.5	11.4	12.8	13.2	13.8	15.2	14.2	15.6	15.9
	6H	11.5	12.8	11.9	13.2	13.6	14.8	16.1	15.2	16.5	16.9
	8H	11.6	12.9	12.0	13.3	13.7	15.1	16.4	15.5	16.8	17.2
	12H	11.7	12.9	12.1	13.3	13.7	15.3	16.6	15.7	16.9	17.4
4H	2H	9.5	11.0	9.9	11.3	11.7	10.5	12.0	10.9	12.3	12.7
	3H	11.6	12.8	12.0	13.2	13.6	13.4	14.6	13.8	15.0	15.4
	4H	12.4	13.5	12.8	13.9	14.4	14.8	16.0	15.3	16.4	16.8
	6H	13.0	14.0	13.4	14.4	14.9	16.0	17.0	16.5	17.5	17.9
	8H	13.2	14.1	13.6	14.5	15.0	16.4	17.4	16.9	17.8	18.3
	12H	13.3	14.1	13.8	14.6	15.1	16.7	17.5	17.2	18.0	18.5
8H	4H	13.2	14.1	13.6	14.5	15.0	15.2	16.1	15.6	16.6	17.0
	6H	14.0	14.8	14.5	15.3	15.7	16.6	17.3	17.0	17.8	18.3
	8H	14.3	15.0	14.8	15.5	16.0	17.1	17.8	17.6	18.3	18.8
	12H	14.5	15.2	15.0	15.6	16.2	17.5	18.1	18.0	18.6	19.1
12H	4H	13.3	14.2	13.8	14.6	15.1	15.2	16.1	15.7	16.5	17.0
	6H	14.3	15.0	14.8	15.4	16.0	16.7	17.4	17.2	17.8	18.4
	8H	14.7	15.3	15.2	15.8	16.3	17.2	17.9	17.7	18.3	18.9

Maximum UGR = 19.1

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	12.2	13.9	12.5	14.2	14.5	13.5	15.2	13.9	15.5	15.8
	3H	14.0	15.5	14.3	15.8	16.2	16.1	17.7	16.5	18.0	18.3
	4H	14.6	16.1	15.0	16.4	16.8	17.4	18.8	17.8	19.2	19.5
	6H	15.1	16.4	15.5	16.8	17.2	18.4	19.7	18.8	20.1	20.5
	8H	15.2	16.5	15.6	16.9	17.3	18.7	20.0	19.1	20.4	20.8
	12H	15.3	16.5	15.7	16.9	17.3	18.9	20.2	19.3	20.5	21.0
4H	2H	13.1	14.6	13.5	14.9	15.3	14.1	15.6	14.5	15.9	16.3
	3H	15.2	16.4	15.6	16.8	17.2	17.0	18.2	17.4	18.6	19.0
	4H	16.0	17.1	16.4	17.5	18.0	18.4	19.6	18.9	20.0	20.4
	6H	16.6	17.6	17.0	18.0	18.5	19.6	20.6	20.1	21.1	21.5
	8H	16.8	17.7	17.2	18.1	18.6	20.0	21.0	20.5	21.4	21.9
	12H	16.9	17.7	17.4	18.2	18.7	20.3	21.1	20.8	21.6	22.1
8H	4H	16.8	17.7	17.2	18.1	18.6	18.8	19.7	19.2	20.2	20.6
	6H	17.6	18.4	18.1	18.9	19.3	20.2	20.9	20.6	21.4	21.9
	8H	17.9	18.6	18.4	19.1	19.6	20.7	21.4	21.2	21.9	22.4
	12H	18.1	18.8	18.6	19.2	19.8	21.1	21.7	21.6	22.2	22.7
12H	4H	16.9	17.8	17.4	18.2	18.7	18.8	19.7	19.3	20.1	20.6
	6H	17.9	18.6	18.4	19.0	19.6	20.3	21.0	20.8	21.4	22.0
	8H	18.3	18.9	18.8	19.4	19.9	20.8	21.5	21.3	21.9	22.5

Maximum UGR = 22.7

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	904	904	904	905	904	904	905	904	904	905	904	904	904	904	904	905	904	904	905
5	900	900	900	900	901	900	901	900	901	900	900	900	900	900	900	900	901	900	901
10	887	887	889	889	889	889	890	889	889	889	889	887	887	887	889	889	889	889	890
15	865	867	869	870	871	871	873	871	871	870	869	867	865	867	869	870	871	871	873
20	835	839	841	843	846	847	849	847	846	843	841	839	835	839	841	843	846	847	849
25	798	802	806	810	814	817	821	817	814	810	806	802	798	802	806	810	814	817	821
30	752	759	765	771	777	783	787	783	777	771	765	759	752	759	765	771	777	783	787
35	701	709	717	725	735	743	748	743	735	725	717	709	701	709	717	725	735	743	748
40	645	654	665	675	690	700	706	700	690	675	665	654	645	654	665	675	690	700	706
45	583	593	607	622	640	654	662	654	640	622	607	593	583	593	607	622	640	654	662
50	518	529	545	565	588	605	614	605	588	565	545	529	518	529	545	565	588	605	614
55	450	462	481	507	533	554	564	554	533	507	481	462	450	462	481	507	533	554	564
60	379	392	415	446	478	501	512	501	478	446	415	392	379	392	415	446	478	501	512
65	306	320	349	385	420	446	458	446	420	385	349	320	306	320	349	385	420	446	458
70	231	247	284	324	362	390	403	390	362	324	284	247	231	247	284	324	362	390	403
75	158	178	220	264	304	333	345	333	304	264	220	178	158	178	220	264	304	333	345
80	89.4	114	159	197	214	224	228	224	214	197	159	114	89.4	114	159	197	214	224	228
85	33.3	56.9	81.3	89.3	92.5	94.6	95.9	94.6	92.5	89.3	81.3	56.9	33.3	56.9	81.3	89.3	92.5	94.6	95.9
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	904	904	905	904	904														
5	900	901	900	900	900														
10	889	889	889	889	887														
15	871	871	870	869	867														
20	847	846	843	841	839														
25	817	814	810	806	802														
30	783	777	771	765	759														
35	743	735	725	717	709														
40	700	690	675	665	654														
45	654	640	622	607	593														
50	605	588	565	545	529														
55	554	533	507	481	462														
60	501	478	446	415	392														
65	446	420	385	349	320														
70	390	362	324	284	247														
75	333	304	264	220	178														
80	224	214	197	159	114														
85	94.6	92.5	89.3	81.3	56.9														
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.	C-SWISH2X4@20W3500K	Sample ID	240301001-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	0.169	20.2	0.994	8.91
277.0	60	0.081	20.4	0.904	10.24

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*****