

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: 2024-01-29

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

Issue Date: 2024-01-29

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

1x4 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	1500		3347
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	137.2
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		24.4
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	7.84
			277V	13.96
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.996
			277V	0.973
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4078
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		85.1
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		21
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		96
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-12%≤IES Rcs,h1≤+23%		-10%
Zonal Lumen Requirement (0°-60°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≥75%		78.3%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	20.7
		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	1.30
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		0.091
(Goniophotometer – Section 4.2)		Non-Worst Case		0.203
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		24.4
(Goniophotometer – Section 4.2)		Non-Worst Case		24.3

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-01-26	C-SWISH1X4@25W4000K	240119003-S1
2	Goniophotometer Test	2024-01-26	C-SWISH1X4@25W4000K	240119003-S1
3	THD and PF Test	2024-01-26	C-SWISH1X4@25W4000K	240119003-S1

Remark (If any)

- The results contained in this report pertain only to the tested samples.
- This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
- 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-SWISH1X4@25W4000K, 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-SWISH1X4@25W4000K	Sample ID	240119003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

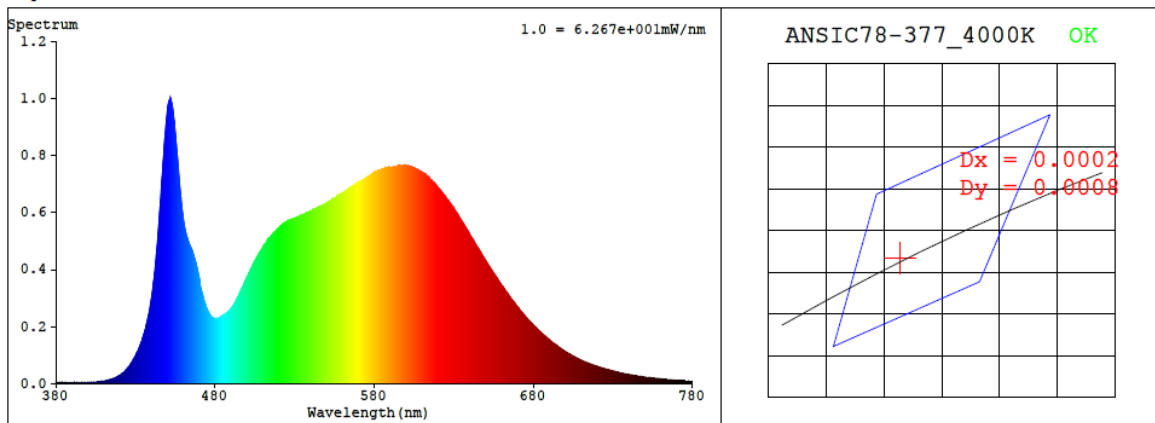
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25 \pm 1^\circ\text{C}$.</p> <p>The sample measurements 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	0.203	24.3	0.996
277.0	60	0.091	24.4	0.973

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4078	85.1	21	0.0003	85	96	-10%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3773$ $y = 0.3755$ / $u' = 0.2235$ $v' = 0.5006$ ($duv=3.32e-04$)

CCT= 4078K Prcp WL: $L_d=578.6nm$ Purity=25.9%

Peak WL: $L_p=452nm$ FWHM: $=19.2nm$ Ratio:R=18.4% G=77.9% B=3.7%

Render Index: $R_a = 85.1$ AvgR = 79.0 TM30:Rf=85 Rg=96

EEL: 0.11667 A+

R1 =84 R2 =90 R3 =95 R4 =84 R5 =84 R6 =86 R7 =88

R8 =70 R9 =21 R10=77 R11=83 R12=61 R13=86 R14=97 R15=79

4.1 Integrating Sphere Test

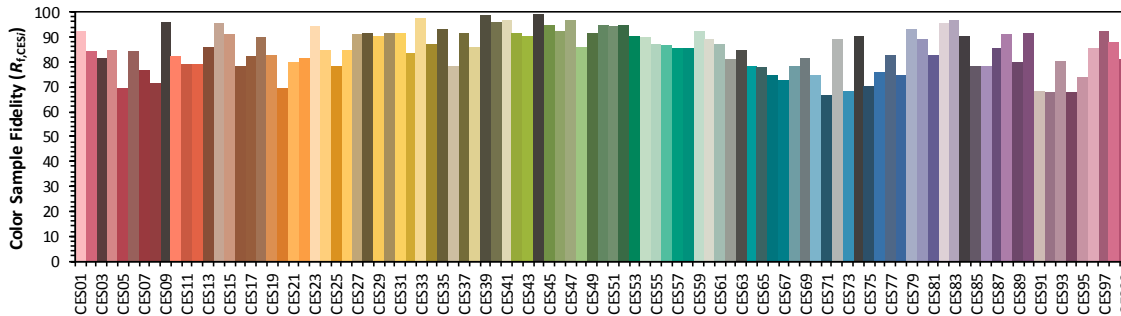
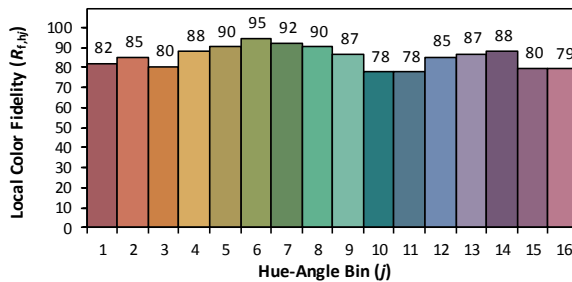
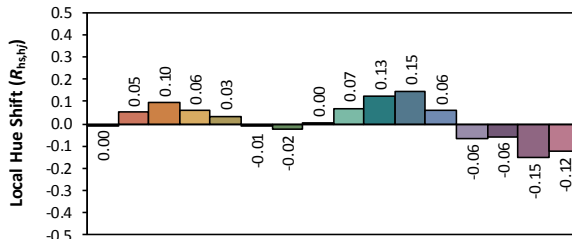
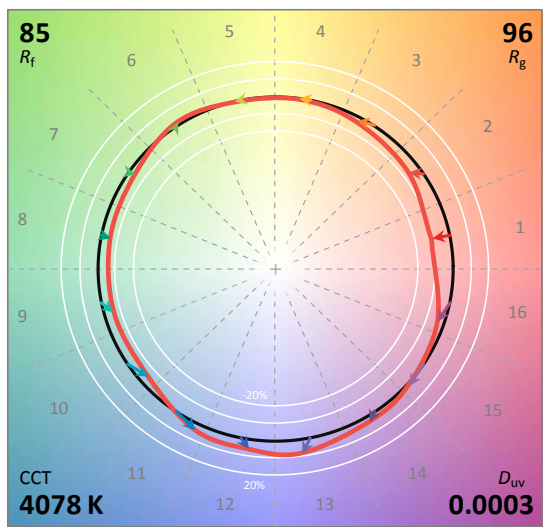
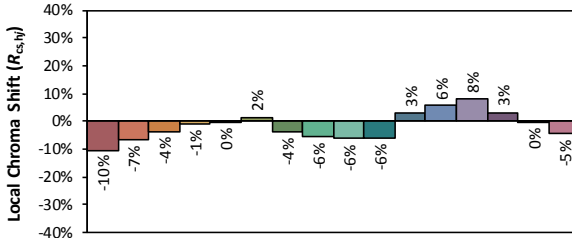
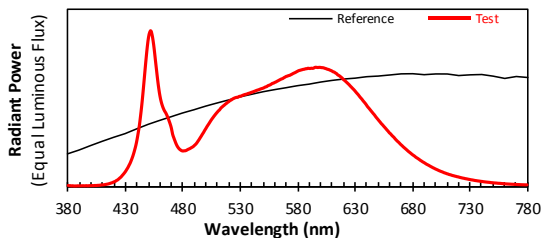
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/1/29

Model: C-SWISH1X4@25W4000K



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

x 0.3773
 y 0.3753
 u' 0.2236
 v' 0.5005

CIE 13.3-1995
(CRI)

R_a 85
 R_g 21

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	5.70E-06	447	7.50E-04	514	5.09E-04	581	7.44E-04	648	4.49E-04	715	6.97E-05
381	4.30E-06	448	8.30E-04	515	5.16E-04	582	7.46E-04	649	4.39E-04	716	6.82E-05
382	4.10E-06	449	9.01E-04	516	5.22E-04	583	7.48E-04	650	4.31E-04	717	6.59E-05
383	2.90E-06	450	9.58E-04	517	5.28E-04	584	7.50E-04	651	4.21E-04	718	6.43E-05
384	3.70E-06	451	9.89E-04	518	5.34E-04	585	7.52E-04	652	4.13E-04	719	6.21E-05
385	1.90E-06	452	1.00E-03	519	5.40E-04	586	7.53E-04	653	4.03E-04	720	6.08E-05
386	2.60E-06	453	9.77E-04	520	5.45E-04	587	7.56E-04	654	3.96E-04	721	5.86E-05
387	2.20E-06	454	9.35E-04	521	5.51E-04	588	7.56E-04	655	3.87E-04	722	5.66E-05
388	3.30E-06	455	8.79E-04	522	5.55E-04	589	7.59E-04	656	3.79E-04	723	5.48E-05
389	3.20E-06	456	8.11E-04	523	5.60E-04	590	7.58E-04	657	3.70E-04	724	5.30E-05
390	3.10E-06	457	7.46E-04	524	5.64E-04	591	7.58E-04	658	3.61E-04	725	5.18E-05
391	3.40E-06	458	6.82E-04	525	5.68E-04	592	7.59E-04	659	3.54E-04	726	4.98E-05
392	3.40E-06	459	6.25E-04	526	5.70E-04	593	7.58E-04	660	3.44E-04	727	4.86E-05
393	4.00E-06	460	5.80E-04	527	5.72E-04	594	7.60E-04	661	3.38E-04	728	4.71E-05
394	3.10E-06	461	5.45E-04	528	5.73E-04	595	7.64E-04	662	3.29E-04	729	4.55E-05
395	3.70E-06	462	5.20E-04	529	5.78E-04	596	7.65E-04	663	3.22E-04	730	4.41E-05
396	4.10E-06	463	5.00E-04	530	5.79E-04	597	7.64E-04	664	3.15E-04	731	4.24E-05
397	3.30E-06	464	4.84E-04	531	5.81E-04	598	7.64E-04	665	3.06E-04	732	4.14E-05
398	4.10E-06	465	4.72E-04	532	5.85E-04	599	7.65E-04	666	2.98E-04	733	4.01E-05
399	4.40E-06	466	4.57E-04	533	5.88E-04	600	7.64E-04	667	2.90E-04	734	3.86E-05
400	4.30E-06	467	4.40E-04	534	5.90E-04	601	7.63E-04	668	2.84E-04	735	3.72E-05
401	4.80E-06	468	4.19E-04	535	5.92E-04	602	7.63E-04	669	2.76E-04	736	3.63E-05
402	4.40E-06	469	3.98E-04	536	5.94E-04	603	7.61E-04	670	2.68E-04	737	3.50E-05
403	5.50E-06	470	3.72E-04	537	5.97E-04	604	7.58E-04	671	2.62E-04	738	3.41E-05
404	5.30E-06	471	3.35E-04	538	5.99E-04	605	7.56E-04	672	2.55E-04	739	3.31E-05
405	5.80E-06	472	3.13E-04	539	6.02E-04	606	7.53E-04	673	2.48E-04	740	3.19E-05
406	6.50E-06	473	2.93E-04	540	6.05E-04	607	7.51E-04	674	2.42E-04	741	3.12E-05
407	6.70E-06	474	2.74E-04	541	6.07E-04	608	7.48E-04	675	2.35E-04	742	2.98E-05
408	7.90E-06	475	2.59E-04	542	6.10E-04	609	7.45E-04	676	2.29E-04	743	2.89E-05
409	8.90E-06	476	2.48E-04	543	6.13E-04	610	7.41E-04	677	2.22E-04	744	2.80E-05
410	9.30E-06	477	2.39E-04	544	6.16E-04	611	7.36E-04	678	2.17E-04	745	2.72E-05
411	1.01E-05	478	2.33E-04	545	6.19E-04	612	7.34E-04	679	2.11E-04	746	2.64E-05
412	1.11E-05	479	2.29E-04	546	6.21E-04	613	7.28E-04	680	2.04E-04	747	2.57E-05
413	1.27E-05	480	2.27E-04	547	6.24E-04	614	7.24E-04	681	1.99E-04	748	2.48E-05
414	1.41E-05	481	2.28E-04	548	6.27E-04	615	7.16E-04	682	1.94E-04	749	2.36E-05
415	1.57E-05	482	2.29E-04	549	6.29E-04	616	7.13E-04	683	1.88E-04	750	2.32E-05
416	1.78E-05	483	2.31E-04	550	6.31E-04	617	7.07E-04	684	1.83E-04	751	2.22E-05
417	2.05E-05	484	2.36E-04	551	6.35E-04	618	7.01E-04	685	1.78E-04	752	2.17E-05
418	2.26E-05	485	2.39E-04	552	6.39E-04	619	6.95E-04	686	1.73E-04	753	2.12E-05
419	2.58E-05	486	2.42E-04	553	6.41E-04	620	6.86E-04	687	1.67E-04	754	2.04E-05
420	2.90E-05	487	2.47E-04	554	6.46E-04	621	6.81E-04	688	1.63E-04	755	1.96E-05
421	3.21E-05	488	2.51E-04	555	6.49E-04	622	6.74E-04	689	1.58E-04	756	1.94E-05
422	3.72E-05	489	2.56E-04	556	6.52E-04	623	6.67E-04	690	1.54E-04	757	1.88E-05
423	4.12E-05	490	2.63E-04	557	6.57E-04	624	6.60E-04	691	1.49E-04	758	1.79E-05
424	4.72E-05	491	2.70E-04	558	6.62E-04	625	6.53E-04	692	1.44E-04	759	1.74E-05
425	5.39E-05	492	2.78E-04	559	6.63E-04	626	6.44E-04	693	1.40E-04	760	1.68E-05
426	6.01E-05	493	2.89E-04	560	6.68E-04	627	6.37E-04	694	1.36E-04	761	1.63E-05
427	6.89E-05	494	3.00E-04	561	6.71E-04	628	6.29E-04	695	1.32E-04	762	1.56E-05
428	7.73E-05	495	3.12E-04	562	6.75E-04	629	6.22E-04	696	1.28E-04	763	1.52E-05
429	8.64E-05	496	3.23E-04	563	6.79E-04	630	6.13E-04	697	1.24E-04	764	1.48E-05
430	9.65E-05	497	3.35E-04	564	6.83E-04	631	6.04E-04	698	1.20E-04	765	1.44E-05
431	1.09E-04	498	3.47E-04	565	6.87E-04	632	5.96E-04	699	1.16E-04	766	1.39E-05
432	1.20E-04	499	3.60E-04	566	6.91E-04	633	5.88E-04	700	1.12E-04	767	1.35E-05
433	1.35E-04	500	3.72E-04	567	6.93E-04	634	5.78E-04	701	1.09E-04	768	1.32E-05
434	1.50E-04	501	3.84E-04	568	6.98E-04	635	5.69E-04	702	1.06E-04	769	1.27E-05
435	1.68E-04	502	3.95E-04	569	7.02E-04	636	5.61E-04	703	1.02E-04	770	1.23E-05
436	1.87E-04	503	4.07E-04	570	7.06E-04	637	5.51E-04	704	9.89E-05	771	1.21E-05
437	2.10E-04	504	4.19E-04	571	7.08E-04	638	5.42E-04	705	9.59E-05	772	1.15E-05
438	2.36E-04	505	4.30E-04	572	7.12E-04	639	5.33E-04	706	9.33E-05	773	1.14E-05
439	2.65E-04	506	4.40E-04	573	7.13E-04	640	5.23E-04	707	9.00E-05	774	1.08E-05
440	3.01E-04	507	4.50E-04	574	7.17E-04	641	5.12E-04	708	8.68E-05	775	1.05E-05
441	3.44E-04	508	4.59E-04	575	7.21E-04	642	5.04E-04	709	8.47E-05	776	1.02E-05
442	3.90E-04	509	4.69E-04	576	7.25E-04	643	4.95E-04	710	8.15E-05	777	1.01E-05
443	4.49E-04	510	4.77E-04	577	7.28E-04	644	4.85E-04	711	7.96E-05	778	9.70E-06
444	5.14E-04	511	4.86E-04	578	7.32E-04	645	4.76E-04	712	7.64E-05	779	9.80E-06
445	5.88E-04	512	4.92E-04	579	7.36E-04	646	4.67E-04	713	7.47E-05	780	9.80E-06
446	6.68E-04	513	5.03E-04	580	7.40E-04	647	4.59E-04	714	7.24E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	C-SWISH1X4@25W4000K	Sample ID	240119003-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	42.1

Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at $25 \pm 1^{\circ}\text{C}$, 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	0.091	24.4	0.973
NON-WORST CASE	120.0	60	0.203	24.3	0.996

Test Result

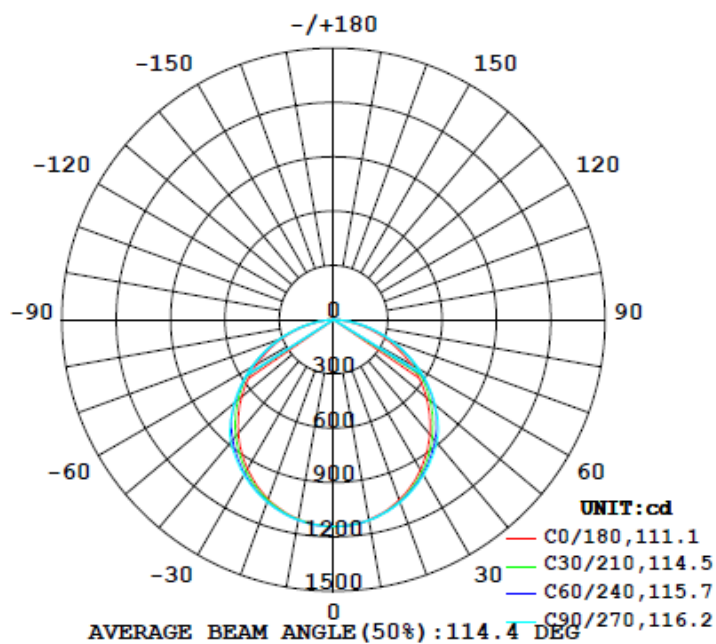
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement
	C0-180	C90-270	C0-180	C90-270		(0° - 60°)
3347	161.1	162.3	111.1	116.0	137.2	78.3%

UGR		Spacing Criterion	
Crosswise	Endwise	(0° - 180°)	(90° - 270°)
20.1	20.7	1.26	1.30

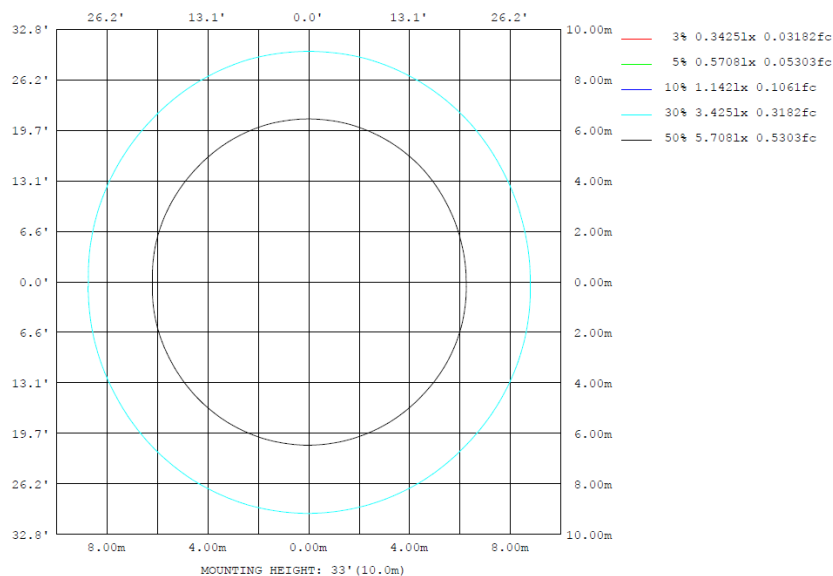
4.2 Goniophotometer Test

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	1122	1124	1125	1125	1119	1121	1124	1124	0- 10	108.2	108.2	3.23,3.23
20	1060	1069	1074	1069	1055	1064	1073	1069	10- 20	310.5	418.7	12.5,12.5
30	959.9	977.5	993.4	979.6	951.0	972.4	989.7	976.5	20- 30	472.8	891.5	26.6,26.6
40	826.7	857.4	887.1	859.9	818.9	850.8	883.9	856.1	30- 40	575.3	1467	43.8,43.8
50	669.4	714.5	732.8	718.7	663.1	706.6	716.9	712.1	40- 50	604.9	2072	61.9,61.9
60	493.5	535.1	544.7	540.2	488.4	517.3	521.3	524.5	50- 60	549.6	2621	78.3,78.3
70	303.1	337.2	341.8	341.6	299.3	317.2	315.9	322.0	60- 70	419.1	3040	90.8,90.8
80	115.9	143.5	145.7	146.2	113.3	126.3	121.2	127.6	70- 80	239.3	3280	98,98
90	0.9568	2.874	3.984	3.155	0.8090	2.943	0.7328	2.663	80- 90	58.82	3339	99.8,99.8
100	1.162	0.5410	0.5515	0.6769	1.885	0.9918	0.8924	1.106	90-100	1.234	3340	99.8,99.8
110	2.536	0.5410	0.5515	0.7151	3.462	1.445	1.234	1.386	100-110	1.233	3341	99.8,99.8
120	2.064	0.5410	0.5515	1.199	3.049	1.662	1.446	1.662	110-120	1.375	3342	99.9,99.9
130	0.8967	0.5410	0.5515	1.240	1.431	1.780	1.471	1.662	120-130	1.234	3344	99.9,99.9
140	0.8967	0.7388	0.5515	1.383	1.305	1.924	1.471	1.662	130-140	1.051	3345	99.9,99.9
150	0.8967	0.9890	0.5515	1.384	1.301	2.175	1.471	1.662	140-150	0.9027	3346	100,100
160	0.8967	1.316	0.7377	1.385	1.435	2.345	1.471	1.662	150-160	0.6967	3346	100,100
170	1.225	1.456	1.297	1.568	1.435	2.493	1.471	1.662	160-170	0.4478	3347	100,100
180	1.435	1.623	1.471	1.847	1.435	2.254	1.471	1.570	170-180	0.1630	3347	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	108.16	0-10	108.16	3.23%
10-20	310.51	0-20	418.67	12.51%
20-30	472.82	0-30	891.49	26.64%
30-40	575.33	0-40	1466.82	43.83%
40-50	604.85	0-50	2071.67	61.90%
50-60	549.55	0-60	2621.22	78.32%
60-70	419.15	0-70	3040.37	90.85%
70-80	239.34	0-80	3279.71	98.00%
80-90	58.82	0-90	3338.53	99.76%
90-100	1.23	0-100	3339.76	99.79%
100-110	1.23	0-110	3340.99	99.83%
110-120	1.38	0-120	3342.37	99.87%
120-130	1.23	0-130	3343.60	99.91%
130-140	1.05	0-140	3344.65	99.94%
140-150	0.90	0-150	3345.55	99.97%
150-160	0.70	0-160	3346.25	99.99%
160-170	0.45	0-170	3346.70	100.00%
170-180	0.16	0-180	3346.86	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	11.6	13.2	12.0	13.6	13.9	12.1	13.7	12.4	14.0	14.3
	3H	13.4	14.9	13.8	15.2	15.6	13.9	15.4	14.3	15.7	16.1
	4H	14.0	15.4	14.4	15.8	16.2	14.6	16.0	15.0	16.4	16.7
	6H	14.5	15.8	14.9	16.1	16.5	15.1	16.4	15.5	16.8	17.2
	8H	14.6	15.8	15.0	16.2	16.6	15.3	16.5	15.7	16.9	17.3
	12H	14.6	15.8	15.1	16.2	16.7	15.4	16.6	15.8	16.9	17.4
4H	2H	12.3	13.7	12.7	14.1	14.4	12.7	14.1	13.1	14.5	14.8
	3H	14.3	15.5	14.7	15.9	16.3	14.8	16.0	15.2	16.4	16.8
	4H	15.1	16.2	15.5	16.6	17.0	15.6	16.7	16.0	17.1	17.5
	6H	15.7	16.6	16.1	17.1	17.5	16.2	17.2	16.7	17.6	18.1
	8H	15.9	16.7	16.3	17.2	17.6	16.5	17.3	16.9	17.8	18.2
	12H	15.9	16.7	16.4	17.2	17.7	16.6	17.4	17.1	17.8	18.3
8H	4H	15.5	16.3	15.9	16.8	17.2	15.9	16.8	16.4	17.2	17.7
	6H	16.2	16.9	16.7	17.4	17.8	16.7	17.4	17.2	17.9	18.4
	8H	16.4	17.0	16.9	17.5	18.0	17.0	17.6	17.5	18.1	18.6
	12H	16.5	17.1	17.0	17.6	18.2	17.2	17.7	17.7	18.2	18.8
12H	4H	15.5	16.3	16.0	16.8	17.2	16.0	16.7	16.4	17.2	17.7
	6H	16.2	16.9	16.7	17.3	17.9	16.8	17.4	17.3	17.9	18.4
	8H	16.5	17.1	17.0	17.6	18.1	17.1	17.7	17.6	18.1	18.7

Maximum UGR = 18.8

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	15.8	17.4	16.2	17.8	18.1	16.3	17.9	16.6	18.2	18.5
	3H	17.6	19.1	18.0	19.4	19.8	18.1	19.6	18.5	19.9	20.3
	4H	18.2	19.6	18.6	20.0	20.4	18.8	20.2	19.2	20.6	20.9
	6H	18.7	20.0	19.1	20.3	20.7	19.3	20.6	19.7	21.0	21.4
	8H	18.8	20.0	19.2	20.4	20.8	19.5	20.7	19.9	21.1	21.5
	12H	18.8	20.0	19.3	20.4	20.9	19.6	20.8	20.0	21.1	21.6
4H	2H	16.5	17.9	16.9	18.3	18.6	16.9	18.3	17.3	18.7	19.0
	3H	18.5	19.7	18.9	20.1	20.5	19.0	20.2	19.4	20.6	21.0
	4H	19.3	20.4	19.7	20.8	21.2	19.8	20.9	20.2	21.3	21.7
	6H	19.9	20.8	20.3	21.3	21.7	20.4	21.4	20.9	21.8	22.3
	8H	20.1	20.9	20.5	21.4	21.8	20.7	21.5	21.1	22.0	22.4
	12H	20.1	20.9	20.6	21.4	21.9	20.8	21.6	21.3	22.0	22.5
8H	4H	19.7	20.5	20.1	21.0	21.4	20.1	21.0	20.6	21.4	21.9
	6H	20.4	21.1	20.9	21.6	22.0	20.9	21.6	21.4	22.1	22.6
	8H	20.6	21.2	21.1	21.7	22.2	21.2	21.8	21.7	22.3	22.8
	12H	20.7	21.3	21.2	21.8	22.4	21.4	21.9	21.9	22.4	23.0
12H	4H	19.7	20.5	20.2	21.0	21.4	20.2	20.9	20.6	21.4	21.9
	6H	20.4	21.1	20.9	21.5	22.1	21.0	21.6	21.5	22.1	22.6
	8H	20.7	21.3	21.2	21.8	22.3	21.3	21.9	21.8	22.3	22.9

Maximum UGR = 23.0

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	1142	1143	1143	1143	1143	1142	1142	1143	1142	1144	1142	1143	1142	1143	1143	1143	1143	1142	1142
5	1138	1138	1139	1138	1139	1138	1138	1139	1139	1138	1138	1139	1135	1138	1137	1137	1138	1137	1138
10	1122	1124	1125	1124	1125	1125	1125	1126	1126	1125	1123	1122	1119	1122	1121	1121	1125	1124	1124
15	1096	1100	1102	1100	1103	1103	1104	1104	1104	1101	1099	1097	1092	1096	1097	1098	1102	1103	1102
20	1060	1066	1069	1069	1071	1074	1074	1074	1073	1069	1064	1061	1055	1059	1062	1064	1070	1073	1073
25	1014	1022	1025	1027	1033	1036	1037	1037	1035	1029	1021	1016	1008	1015	1018	1023	1030	1035	1034
30	960	968	974	978	985	990	993	992	987	980	969	962	951	961	966	972	982	989	990
35	896	907	915	922	932	938	942	941	935	923	909	900	888	899	907	915	928	937	940
40	827	838	848	857	873	882	887	885	876	860	842	831	819	831	840	851	868	880	884
45	750	763	775	788	807	816	818	818	810	791	770	756	744	755	767	782	801	806	806
50	669	683	697	715	726	730	733	733	731	719	693	676	663	675	688	707	712	716	717
55	583	597	614	630	635	638	641	641	640	636	611	590	578	589	606	615	618	620	622
60	493	507	530	535	539	543	545	544	544	540	527	502	488	499	519	517	519	521	521
65	400	415	434	437	439	442	443	444	444	442	433	410	395	406	420	417	418	418	418
70	303	321	335	337	339	340	342	342	342	342	335	318	299	313	319	317	317	316	316
75	207	228	236	238	240	240	242	243	243	242	237	226	203	218	221	219	218	217	217
80	116	134	142	144	144	145	146	147	147	146	143	133	113	126	128	126	124	121	121
85	41.0	53.2	56.9	56.3	55.2	54.2	53.9	54.5	56.7	58.1	57.7	53.4	39.1	46.7	45.9	41.5	36.7	33.3	32.2
90	0.96	1.40	2.22	2.87	3.35	3.72	3.98	3.74	3.65	3.16	2.44	1.88	0.81	0.90	0.72	2.94	5.33	6.47	0.73
95	0.90	1.27	0.57	0.54	0.55	0.46	0.55	0.46	0.65	0.66	0.82	1.27	1.35	1.35	1.04	0.81	1.81	2.44	0.75
100	1.16	1.14	0.55	0.54	0.55	0.46	0.55	0.46	0.65	0.68	0.89	0.91	1.89	1.71	1.26	0.99	1.06	0.90	0.89
105	1.97	1.01	0.52	0.54	0.55	0.46	0.55	0.46	0.65	0.70	0.96	1.35	2.78	2.43	1.53	1.23	1.05	1.06	1.12
110	2.54	1.11	0.50	0.54	0.55	0.46	0.55	0.46	0.65	0.72	1.01	1.45	3.46	2.62	1.89	1.45	1.36	1.19	1.23
115	2.44	1.19	0.48	0.54	0.55	0.46	0.55	0.46	0.65	0.73	1.11	1.45	3.41	2.62	1.95	1.62	1.45	1.42	1.43
120	2.06	1.28	0.46	0.54	0.55	0.46	0.55	0.46	0.65	1.20	1.21	1.45	3.05	2.52	2.00	1.66	1.56	1.49	1.45
125	1.61	1.35	0.54	0.54	0.55	0.46	0.55	0.46	0.65	1.17	1.31	1.45	2.51	2.41	2.05	1.72	1.60	1.54	1.46
130	0.90	1.39	0.72	0.54	0.55	0.46	0.55	0.46	0.84	1.24	1.38	1.45	1.43	2.36	2.10	1.78	1.54	1.55	1.47
135	0.90	1.42	0.72	0.69	0.55	0.46	0.55	0.55	0.91	1.31	1.41	1.45	1.37	2.62	2.16	1.86	1.65	1.56	1.47
140	0.90	1.50	0.92	0.74	0.55	0.46	0.55	0.51	0.98	1.38	1.43	1.45	1.31	2.66	2.21	1.92	1.73	1.55	1.47
145	0.90	1.60	1.11	0.79	0.73	0.46	0.55	0.56	1.02	1.38	1.46	1.51	1.17	2.70	2.17	1.97	1.73	1.55	1.47
150	0.90	1.61	1.17	0.99	0.73	0.46	0.55	0.61	1.11	1.38	1.65	1.60	1.30	2.25	2.62	2.17	1.73	1.55	1.47
155	0.90	1.60	1.22	1.26	0.94	0.64	0.55	0.74	1.18	1.38	1.67	1.61	1.35	1.80	2.62	2.25	1.73	1.55	1.47
160	0.90	1.58	1.30	1.32	1.11	0.65	0.74	0.97	1.22	1.38	1.70	1.61	1.44	1.52	2.62	2.35	1.73	1.55	1.47
165	1.08	1.57	1.40	1.26	1.21	0.82	1.01	1.19	1.26	1.42	1.73	1.62	1.44	1.49	2.61	2.46	1.73	1.55	1.47
170	1.23	1.55	1.89	1.46	1.32	1.19	1.30	1.28	1.29	1.57	2.37	1.62	1.43	1.47	2.43	2.49	1.73	1.55	1.47
175	1.37	1.54	2.33	1.62	1.52	1.39	1.47	1.48	1.53	1.81	2.83	1.63	1.43	1.45	1.71	2.52	1.73	1.55	1.47
180	1.43	1.53	2.25	1.62	1.54	1.46	1.47	1.48	1.57	1.85	2.83	1.63	1.43	1.44	1.53	2.25	1.64	1.55	1.47

Table--2

UNIT: cd

C (DEG) y (DEG)	285	300	315	330	345														
0	1143	1142	1144	1142	1143														
5	1138	1138	1138	1137	1138														
10	1125	1123	1124	1121	1122														
15	1103	1102	1101	1097	1096														
20	1072	1071	1069	1061	1059														
25	1034	1032	1027	1018	1014														
30	990	984	976	965	959														
35	937	930	919	906	897														
40	880	869	856	839	828														
45	806	803	786	766	753														
50	718	716	712	687	673														
55	622	622	622	606	587														
60	523	523	524	520	498														
65	420	422	424	422	405														
70	318	320	322	321	312														
75	218	220	222	222	218														
80	122	125	128	129	125														
85	33.1	36.9	41.8	45.7	45.9														
90	0.74	2.46	2.66	0.73	3.43														
95	0.77	1.14	1.34	1.01	1.18														
100	0.97	1.04	1.11	1.24	1.54														
105	1.11	1.20	1.29	1.55	2.08														
110	1.20	1.35	1.39	1.84	2.49														
115	1.33	1.39	1.66	1.87	2.56														
120	1.45	1.48	1.66	1.90	2.63														
125	1.48	1.48	1.66	1.92	2.71														
130	1.48	1.48	1.66	1.95	2.37														
135	1.48	1.48	1.66	1.98	2.58														
140	1.48	1.48	1.66	2.01	2.68														
145	1.48	1.48	1.66	2.20	2.89														
150	1.48	1.48	1.66	2.30	2.92														
155	1.48	1.48	1.66	2.28	2.95														
160	1.48	1.48	1.66	1.98	2.98														
165	1.48	1.48	1.66	1.93	2.93														
170	1.48	1.48	1.66	1.89	2.88														
175	1.48	1.48	1.66	1.85	2.83														
180	1.48	1.48	1.57	1.83	2.80														

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	C-SWISH1X4@25W4000K	Sample ID	240119003-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	0.203	24.3	0.996	7.84
277.0	60	0.091	24.4	0.973	13.96

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*****