

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: 2024-01-29

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

2x2 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		2659
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	135.0
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.7
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	11.98
			277V	14.29
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.990
			277V	0.900
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	4905
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		83.6
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		15
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		96
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%		74.7%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	22.1
		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	1.32
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		0.079
(Goniophotometer – Section 4.2)		Non-Worst Case		0.161
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.7
(Goniophotometer – Section 4.2)		Non-Worst Case		19.1

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-01-25	C-SWISH2X2@20W5000K	240119001-S1
2	Goniophotometer Test	2024-01-25	C-SWISH2X2@20W5000K	240119001-S1
3	THD and PF Test	2024-01-25	C-SWISH2X2@20W5000K	240119001-S1

Remark (If any)

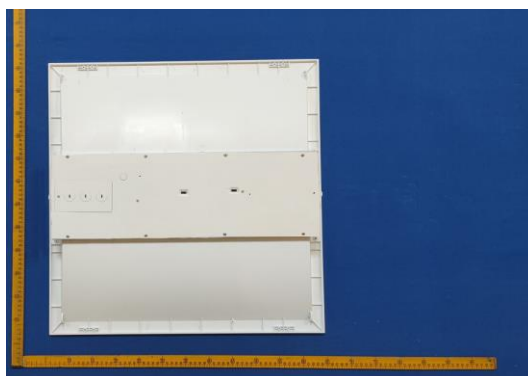
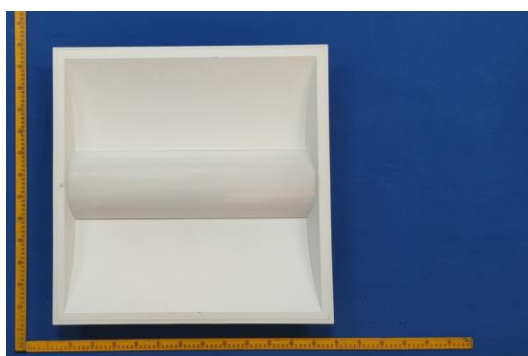
- The results contained in this report pertain only to the tested samples.
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- This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

3.0 Product Description

Luminaire Description: Model No. C-SWISH2X2@20W5000K, 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-SWISH2X2@20W5000K	Sample ID	240119001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

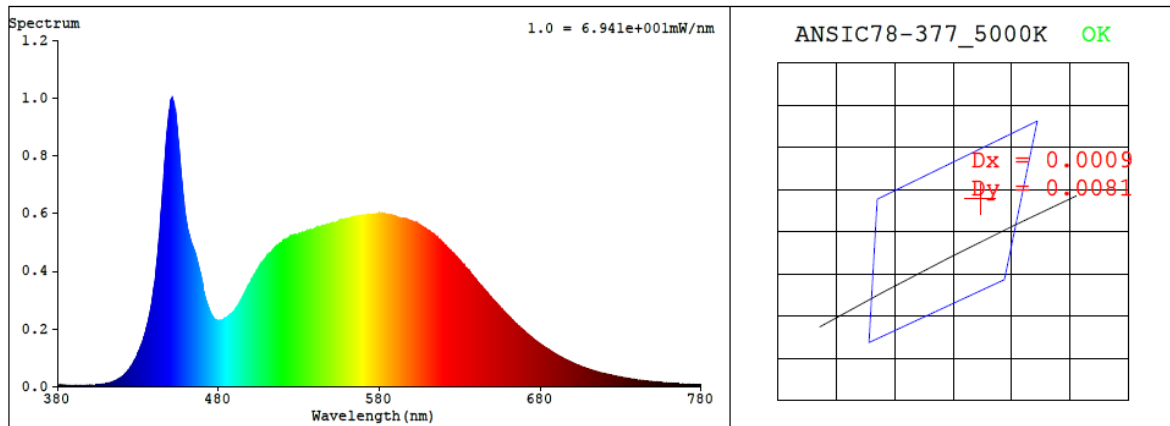
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.161	19.1	0.990
277.0	60	0.079	19.7	0.900

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4905	83.6	15	0.0037	84	96	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3487$ $y = 0.3619$ / $u' = 0.2099$ $v' = 0.4901$ ($duv=3.67e-03$)

CCT= 4905K Prcp WL: Ld=570.8nm Purity=13.2%

Peak WL: Lp=451nm FWHM: =20.1nm Ratio:R=15.9% G=79.7% B=4.4%

Render Index: Ra = 83.6 AvgR = 76.6 TM30:Rf=84 Rg=95

EEL: 0.10278 A++ Highest

R1 =82 R2 =88 R3 =93 R4 =82 R5 =81 R6 =83 R7 =89

R8 =70 R9 =15 R10=72 R11=81 R12=55 R13=83 R14=96 R15=77

4.1 Integrating Sphere Test

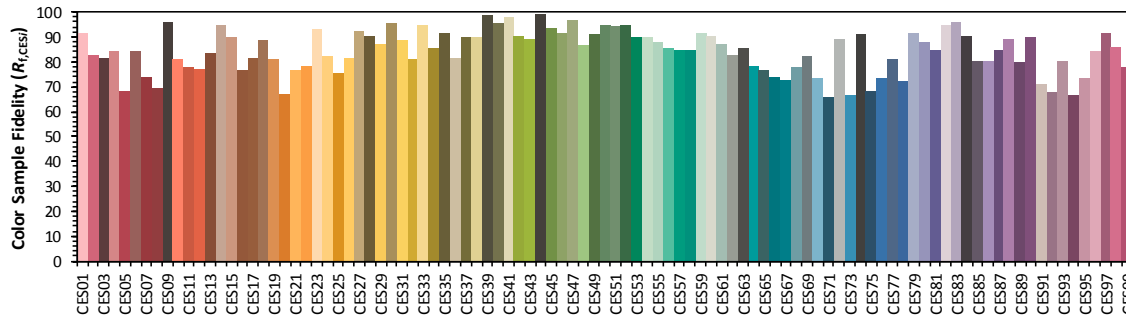
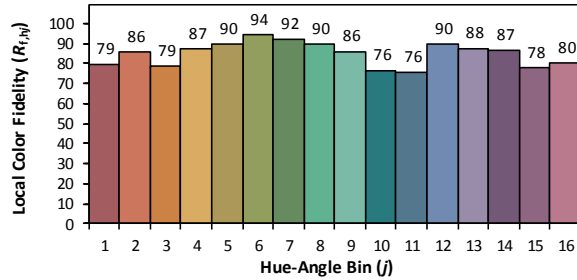
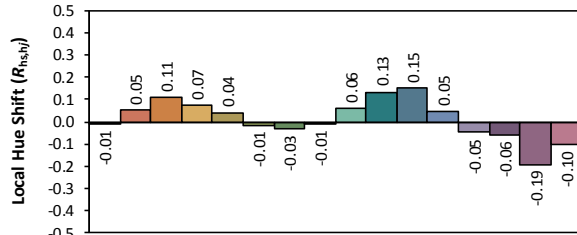
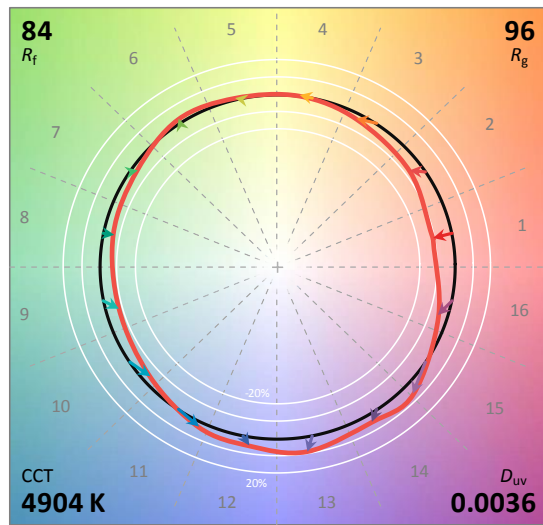
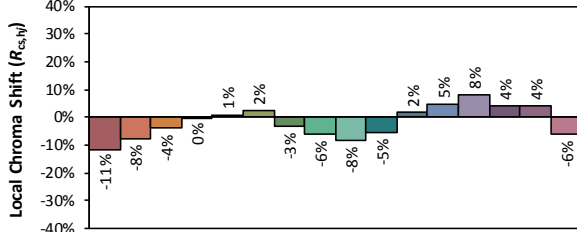
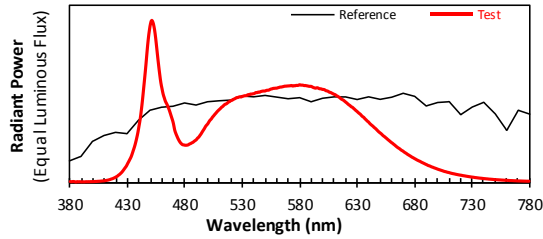
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/1/30

Model: C-SWISH2X2@20W5000K



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

x 0.3487
 y 0.3618
 u' 0.2099
 v' 0.4901

CIE 13.3-1995
(CRI)

R_a 84
 R_g 15

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	8.06E-04	514	4.75E-04	581	5.99E-04	648	3.18E-04	715	5.21E-05
381	4.00E-06	448	8.79E-04	515	4.81E-04	582	5.99E-04	649	3.11E-04	716	5.04E-05
382	5.10E-06	449	9.35E-04	516	4.83E-04	583	5.98E-04	650	3.06E-04	717	4.89E-05
383	5.30E-06	450	9.77E-04	517	4.88E-04	584	5.96E-04	651	3.00E-04	718	4.75E-05
384	3.90E-06	451	9.97E-04	518	4.95E-04	585	5.96E-04	652	2.93E-04	719	4.61E-05
385	2.10E-06	452	9.87E-04	519	4.97E-04	586	5.95E-04	653	2.87E-04	720	4.49E-05
386	4.50E-06	453	9.60E-04	520	5.04E-04	587	5.94E-04	654	2.82E-04	721	4.39E-05
387	3.70E-06	454	9.15E-04	521	5.05E-04	588	5.92E-04	655	2.76E-04	722	4.24E-05
388	4.20E-06	455	8.55E-04	522	5.10E-04	589	5.91E-04	656	2.70E-04	723	4.11E-05
389	3.90E-06	456	7.88E-04	523	5.14E-04	590	5.91E-04	657	2.63E-04	724	4.00E-05
390	2.70E-06	457	7.25E-04	524	5.17E-04	591	5.88E-04	658	2.58E-04	725	3.86E-05
391	4.00E-06	458	6.66E-04	525	5.22E-04	592	5.84E-04	659	2.52E-04	726	3.75E-05
392	2.90E-06	459	6.14E-04	526	5.22E-04	593	5.82E-04	660	2.46E-04	727	3.63E-05
393	3.60E-06	460	5.77E-04	527	5.25E-04	594	5.80E-04	661	2.41E-04	728	3.51E-05
394	4.20E-06	461	5.43E-04	528	5.27E-04	595	5.82E-04	662	2.35E-04	729	3.41E-05
395	3.90E-06	462	5.21E-04	529	5.26E-04	596	5.81E-04	663	2.29E-04	730	3.29E-05
396	4.30E-06	463	4.99E-04	530	5.29E-04	597	5.77E-04	664	2.23E-04	731	3.21E-05
397	4.10E-06	464	4.85E-04	531	5.31E-04	598	5.76E-04	665	2.17E-04	732	3.11E-05
398	4.80E-06	465	4.70E-04	532	5.33E-04	599	5.75E-04	666	2.12E-04	733	2.98E-05
399	4.50E-06	466	4.52E-04	533	5.34E-04	600	5.72E-04	667	2.08E-04	734	2.92E-05
400	5.10E-06	467	4.31E-04	534	5.36E-04	601	5.72E-04	668	2.02E-04	735	2.81E-05
401	5.10E-06	468	4.09E-04	535	5.40E-04	602	5.69E-04	669	1.97E-04	736	2.72E-05
402	5.90E-06	469	3.87E-04	536	5.39E-04	603	5.64E-04	670	1.93E-04	737	2.64E-05
403	5.80E-06	470	3.61E-04	537	5.43E-04	604	5.63E-04	671	1.88E-04	738	2.57E-05
404	6.60E-06	471	3.25E-04	538	5.43E-04	605	5.60E-04	672	1.83E-04	739	2.50E-05
405	6.90E-06	472	3.03E-04	539	5.45E-04	606	5.55E-04	673	1.79E-04	740	2.41E-05
406	7.40E-06	473	2.85E-04	540	5.46E-04	607	5.53E-04	674	1.73E-04	741	2.33E-05
407	8.20E-06	474	2.69E-04	541	5.49E-04	608	5.50E-04	675	1.69E-04	742	2.26E-05
408	9.00E-06	475	2.56E-04	542	5.53E-04	609	5.46E-04	676	1.65E-04	743	2.18E-05
409	9.20E-06	476	2.45E-04	543	5.52E-04	610	5.42E-04	677	1.60E-04	744	2.13E-05
410	1.03E-05	477	2.38E-04	544	5.56E-04	611	5.40E-04	678	1.55E-04	745	2.03E-05
411	1.18E-05	478	2.32E-04	545	5.55E-04	612	5.34E-04	679	1.52E-04	746	1.99E-05
412	1.28E-05	479	2.31E-04	546	5.59E-04	613	5.31E-04	680	1.48E-04	747	1.93E-05
413	1.43E-05	480	2.29E-04	547	5.61E-04	614	5.26E-04	681	1.44E-04	748	1.88E-05
414	1.62E-05	481	2.29E-04	548	5.62E-04	615	5.21E-04	682	1.40E-04	749	1.80E-05
415	1.85E-05	482	2.30E-04	549	5.62E-04	616	5.15E-04	683	1.36E-04	750	1.72E-05
416	2.12E-05	483	2.32E-04	550	5.63E-04	617	5.10E-04	684	1.32E-04	751	1.70E-05
417	2.32E-05	484	2.36E-04	551	5.66E-04	618	5.07E-04	685	1.29E-04	752	1.63E-05
418	2.67E-05	485	2.39E-04	552	5.67E-04	619	5.01E-04	686	1.25E-04	753	1.61E-05
419	2.98E-05	486	2.44E-04	553	5.68E-04	620	4.95E-04	687	1.22E-04	754	1.54E-05
420	3.41E-05	487	2.47E-04	554	5.71E-04	621	4.90E-04	688	1.18E-04	755	1.52E-05
421	3.80E-05	488	2.53E-04	555	5.74E-04	622	4.83E-04	689	1.15E-04	756	1.45E-05
422	4.41E-05	489	2.58E-04	556	5.76E-04	623	4.77E-04	690	1.11E-04	757	1.41E-05
423	4.91E-05	490	2.63E-04	557	5.79E-04	624	4.73E-04	691	1.08E-04	758	1.37E-05
424	5.57E-05	491	2.72E-04	558	5.79E-04	625	4.66E-04	692	1.04E-04	759	1.32E-05
425	6.29E-05	492	2.78E-04	559	5.80E-04	626	4.62E-04	693	1.02E-04	760	1.29E-05
426	7.18E-05	493	2.88E-04	560	5.80E-04	627	4.56E-04	694	9.94E-05	761	1.27E-05
427	8.16E-05	494	2.98E-04	561	5.82E-04	628	4.50E-04	695	9.57E-05	762	1.21E-05
428	9.14E-05	495	3.10E-04	562	5.84E-04	629	4.43E-04	696	9.36E-05	763	1.15E-05
429	1.01E-04	496	3.21E-04	563	5.87E-04	630	4.37E-04	697	9.05E-05	764	1.13E-05
430	1.15E-04	497	3.32E-04	564	5.87E-04	631	4.31E-04	698	8.80E-05	765	1.10E-05
431	1.28E-04	498	3.45E-04	565	5.89E-04	632	4.25E-04	699	8.54E-05	766	1.07E-05
432	1.42E-04	499	3.53E-04	566	5.90E-04	633	4.19E-04	700	8.26E-05	767	1.02E-05
433	1.56E-04	500	3.61E-04	567	5.92E-04	634	4.11E-04	701	8.00E-05	768	1.01E-05
434	1.75E-04	501	3.74E-04	568	5.92E-04	635	4.05E-04	702	7.77E-05	769	9.60E-06
435	1.97E-04	502	3.84E-04	569	5.93E-04	636	4.00E-04	703	7.53E-05	770	9.30E-06
436	2.19E-04	503	3.91E-04	570	5.94E-04	637	3.91E-04	704	7.30E-05	771	9.00E-06
437	2.44E-04	504	4.01E-04	571	5.94E-04	638	3.85E-04	705	7.06E-05	772	8.80E-06
438	2.74E-04	505	4.09E-04	572	5.95E-04	639	3.77E-04	706	6.80E-05	773	8.60E-06
439	3.08E-04	506	4.18E-04	573	5.96E-04	640	3.72E-04	707	6.63E-05	774	8.30E-06
440	3.48E-04	507	4.26E-04	574	5.93E-04	641	3.64E-04	708	6.45E-05	775	8.10E-06
441	3.90E-04	508	4.35E-04	575	5.95E-04	642	3.57E-04	709	6.22E-05	776	7.80E-06
442	4.45E-04	509	4.42E-04	576	5.95E-04	643	3.51E-04	710	6.10E-05	777	7.70E-06
443	5.08E-04	510	4.49E-04	577	5.97E-04	644	3.45E-04	711	5.87E-05	778	7.40E-06
444	5.78E-04	511	4.55E-04	578	5.97E-04	645	3.38E-04	712	5.68E-05	779	7.40E-06
445	6.50E-04	512	4.63E-04	579	5.98E-04	646	3.33E-04	713	5.50E-05	780	7.40E-06
446	7.24E-04	513	4.68E-04	580	6.01E-04	647	3.26E-04	714	5.35E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	C-SWISH2X2@20W5000K	Sample ID	240119001-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	0.079	19.7	0.900
NON-WORST CASE	120.0	60	0.161	19.1	0.990

Test Result

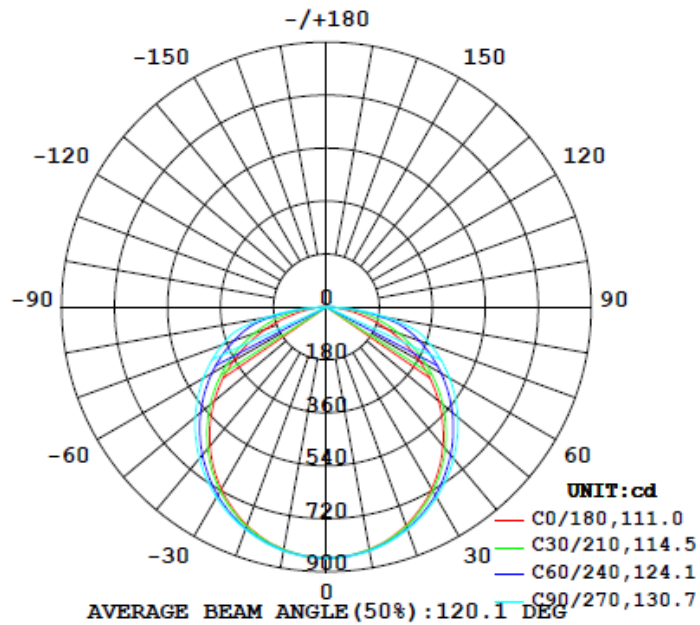
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement
	C0-180	C90-270	C0-180	C90-270		(0°-60°)
2659	160.7	169.7	111.0	130.6	135.0	74.7%

UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
18.9	22.1	1.26	1.32

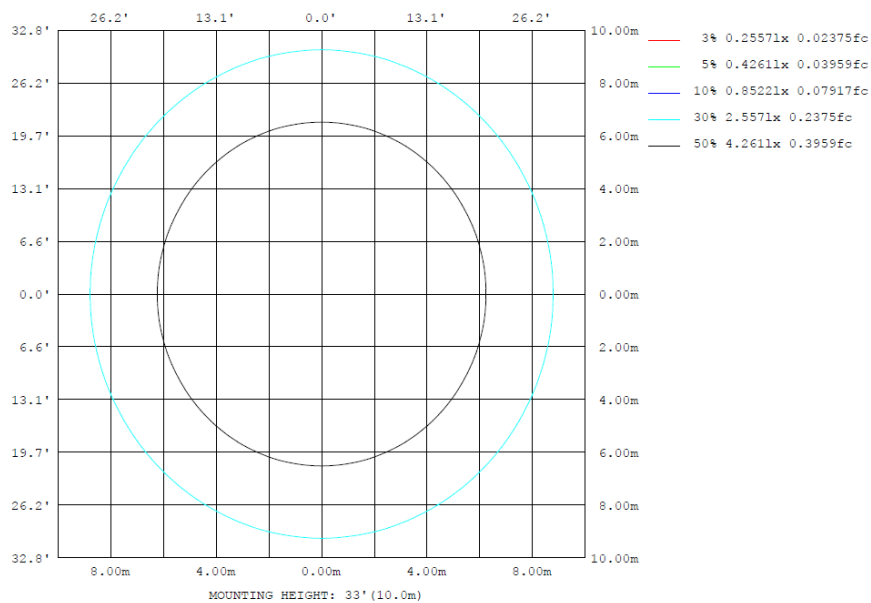
4.2 Goniophotometer Test

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	± zone	± total	\$lum, lamp
10	836.8	839.8	841.1	839.8	836.8	839.8	841.1	839.8	0- 10	80.78	80.78	3.04,3.04
20	790.3	798.0	804.9	798.0	790.3	798.0	804.9	798.0	10- 20	232.0	312.8	11.8,11.8
30	714.5	731.2	747.6	731.2	714.5	731.2	747.6	731.2	20- 30	353.7	666.5	25.1,25.1
40	615.8	642.5	671.9	642.5	615.8	642.5	671.9	642.5	30- 40	431.4	1098	41.3,41.3
50	498.7	536.7	582.3	536.7	498.7	536.7	582.3	536.7	40- 50	457.3	1555	58.5,58.5
60	363.8	420.3	483.0	420.3	363.8	420.3	483.0	420.3	50- 60	430.3	1986	74.7,74.7
70	219.9	298.6	377.3	298.6	219.9	298.6	377.3	298.6	60- 70	356.6	2342	88.1,88.1
80	82.22	167.6	209.5	167.6	82.22	167.6	209.5	167.6	70- 80	244.7	2587	97.3,97.3
90	0	0	0	0	0	0	0	0	80- 90	71.80	2659	100,100
100	0	0	0	0	0	0	0	0	90-100	0	2659	100,100
110	0	0	0	0	0	0	0	0	100-110	0	2659	100,100
120	0	0	0	0	0	0	0	0	110-120	0	2659	100,100
130	0	0	0	0	0	0	0	0	120-130	0	2659	100,100
140	0	0	0	0	0	0	0	0	130-140	0	2659	100,100
150	0	0	0	0	0	0	0	0	140-150	0	2659	100,100
160	0	0	0	0	0	0	0	0	150-160	0	2659	100,100
170	0	0	0	0	0	0	0	0	160-170	0	2659	100,100
180	0	0	0	0	0	0	0	0	170-180	0	2659	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	80.78	0-10	80.78	3.04%
10-20	231.99	0-20	312.77	11.76%
20-30	353.75	0-30	666.52	25.07%
30-40	431.45	0-40	1097.97	41.30%
40-50	457.30	0-50	1555.27	58.50%
50-60	430.33	0-60	1985.60	74.68%
60-70	356.56	0-70	2342.16	88.09%
70-80	244.74	0-80	2586.90	97.30%
80-90	71.80	0-90	2658.70	100.00%
90-100	0.00	0-100	2658.70	100.00%
100-110	0.00	0-110	2658.70	100.00%
110-120	0.00	0-120	2658.70	100.00%
120-130	0.00	0-130	2658.70	100.00%
130-140	0.00	0-140	2658.70	100.00%
140-150	0.00	0-150	2658.70	100.00%
150-160	0.00	0-160	2658.70	100.00%
160-170	0.00	0-170	2658.70	100.00%
170-180	0.00	0-180	2658.70	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	11.0	12.7	11.4	13.1	13.4	12.4	14.1	12.7	14.4	14.7
	3H	12.8	14.3	13.2	14.7	15.0	14.9	16.5	15.3	16.8	17.2
	4H	13.4	14.9	13.8	15.2	15.6	16.1	17.6	16.5	18.0	18.3
	6H	13.9	15.2	14.3	15.6	16.0	17.1	18.5	17.5	18.8	19.2
	8H	14.0	15.3	14.4	15.7	16.1	17.4	18.7	17.8	19.1	19.5
	12H	14.0	15.3	14.5	15.7	16.1	17.6	18.9	18.0	19.2	19.7
4H	2H	12.0	13.4	12.4	13.8	14.1	13.0	14.4	13.4	14.8	15.2
	3H	14.0	15.2	14.4	15.6	16.0	15.8	17.0	16.2	17.4	17.8
	4H	14.8	15.9	15.2	16.3	16.7	17.2	18.3	17.6	18.7	19.2
	6H	15.3	16.3	15.8	16.7	17.2	18.3	19.3	18.8	19.8	20.2
	8H	15.5	16.4	15.9	16.8	17.3	18.7	19.6	19.2	20.1	20.5
	12H	15.6	16.4	16.0	16.9	17.3	19.0	19.8	19.4	20.3	20.7
8H	4H	15.4	16.4	15.9	16.8	17.3	17.5	18.4	18.0	18.9	19.3
	6H	16.2	17.0	16.7	17.5	17.9	18.8	19.6	19.3	20.1	20.6
	8H	16.4	17.2	16.9	17.7	18.1	19.3	20.0	19.8	20.5	21.0
	12H	16.6	17.2	17.1	17.7	18.3	19.6	20.2	20.1	20.7	21.3
12H	4H	15.6	16.4	16.1	16.9	17.4	17.5	18.4	18.0	18.9	19.3
	6H	16.4	17.1	17.0	17.6	18.1	18.9	19.6	19.4	20.0	20.6
	8H	16.8	17.4	17.3	17.9	18.4	19.4	20.0	19.9	20.5	21.1

Maximum UGR = 21.3

UGR – Corrected Table:

UGR TABLE - CORRECTED

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	14.4	16.1	14.8	16.5	16.8	15.8	17.5	16.1	17.8	18.1
	3H	16.2	17.7	16.6	18.1	18.4	18.3	19.9	18.7	20.2	20.6
	4H	16.8	18.3	17.2	18.6	19.0	19.5	21.0	19.9	21.4	21.7
	6H	17.3	18.6	17.7	19.0	19.4	20.5	21.9	20.9	22.2	22.6
	8H	17.4	18.7	17.8	19.1	19.5	20.8	22.1	21.2	22.5	22.9
	12H	17.4	18.7	17.9	19.1	19.5	21.0	22.3	21.4	22.6	23.1
4H	2H	15.4	16.8	15.8	17.2	17.5	16.4	17.8	16.8	18.2	18.6
	3H	17.4	18.6	17.8	19.0	19.4	19.2	20.4	19.6	20.8	21.2
	4H	18.2	19.3	18.6	19.7	20.1	20.6	21.7	21.0	22.1	22.6
	6H	18.7	19.7	19.2	20.1	20.6	21.7	22.7	22.2	23.2	23.6
	8H	18.9	19.8	19.3	20.2	20.7	22.1	23.0	22.6	23.5	23.9
	12H	19.0	19.8	19.4	20.3	20.7	22.4	23.2	22.8	23.7	24.1
8H	4H	18.8	19.8	19.3	20.2	20.7	20.9	21.8	21.4	22.3	22.7
	6H	19.6	20.4	20.1	20.9	21.3	22.2	23.0	22.7	23.5	24.0
	8H	19.8	20.6	20.3	21.1	21.5	22.7	23.4	23.2	23.9	24.4
	12H	20.0	20.6	20.5	21.1	21.7	23.0	23.6	23.5	24.1	24.7
12H	4H	19.0	19.8	19.5	20.3	20.8	20.9	21.8	21.4	22.3	22.7
	6H	19.8	20.5	20.4	21.0	21.5	22.3	23.0	22.8	23.4	24.0
	8H	20.2	20.8	20.7	21.3	21.8	22.8	23.4	23.3	23.9	24.5

Maximum UGR = 24.7

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	852	853	852	854	853	854	854	854	853	854	852	853	852	853	852	854	853	854	854
5	848	849	849	850	851	851	851	851	850	849	849	848	849	849	850	851	851	851	851
10	837	838	837	840	840	841	841	841	840	837	838	837	838	837	840	840	841	841	841
15	818	819	819	822	824	824	826	824	824	822	819	819	818	819	819	822	824	824	826
20	790	791	793	798	801	803	805	803	801	798	793	791	790	791	793	798	801	803	805
25	755	757	761	768	773	778	779	778	773	768	761	757	755	757	761	768	773	778	779
30	715	717	722	731	740	745	748	745	740	731	722	717	715	717	722	731	740	745	748
35	668	672	678	689	700	708	711	708	700	689	678	672	668	672	678	689	700	708	711
40	616	620	628	642	656	668	672	668	656	642	628	620	616	620	628	642	656	668	672
45	560	563	574	591	609	624	629	624	609	591	574	563	560	563	574	591	609	624	629
50	499	503	516	537	558	576	582	576	558	537	516	503	499	503	516	537	558	576	582
55	433	439	455	480	505	526	534	526	505	480	455	439	433	439	455	480	505	526	534
60	364	371	391	420	450	474	483	474	450	420	391	371	364	371	391	420	450	474	483
65	293	302	326	360	393	419	431	419	393	360	326	302	293	302	326	360	393	419	431
70	220	231	261	299	335	363	377	363	335	299	261	231	220	231	261	299	335	363	377
75	148	163	196	237	276	307	321	307	276	237	196	163	148	163	196	237	276	307	321
80	82.2	98.6	133	168	187	200	209	200	187	168	133	98.6	82.2	98.6	133	168	187	200	209
85	29.0	39.0	57.2	68.4	73.7	78.4	82.0	78.4	73.7	68.4	57.2	39.0	29.0	39.0	57.2	68.4	73.7	78.4	82.0
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) y (DEG)	285	300	315	330	345														
0	854	853	854	852	853														
5	851	851	850	849	849														
10	841	840	840	837	838														
15	824	824	822	819	819														
20	803	801	798	793	791														
25	778	773	768	761	757														
30	745	740	731	722	717														
35	708	700	689	678	672														
40	668	656	642	628	620														
45	624	609	591	574	563														
50	576	558	537	516	503														
55	526	505	480	455	439														
60	474	450	420	391	371														
65	419	393	360	326	302														
70	363	335	299	261	231														
75	307	276	237	196	163														
80	200	187	168	133	98.6														
85	78.4	73.7	68.4	57.2	39.0														
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-SWISH2X2@20W5000K	Sample ID	240119001-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±1°C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion was calculated.</p>

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD(%)
120.0	60	0.161	19.1	0.990	11.98
277.0	60	0.079	19.7	0.900	14.29

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*****