

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

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Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

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		2606
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	133.0
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.6
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	11.86
			277V	14.46
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.989
			277V	0.899
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3465±245	3413
		4 steps	3465±124	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		83.4
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		85
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		97
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%		74.6%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	22.0
		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		19.6
(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@20W3500K	240119001-S1
2	Goniophotometer Test	2024-01-25	C-SWISH2X2@20W3500K	240119001-S1
3	THD and PF Test	2024-01-25	C-SWISH2X2@20W3500K	240119001-S1

Remark (If any)

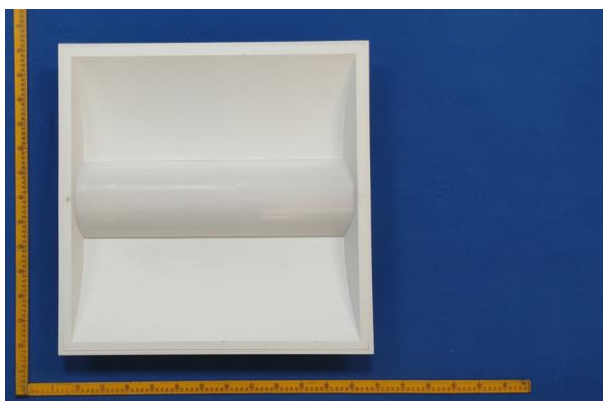
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. C-SWISH2X2@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-SWISH2X2@20W3500K	Sample ID	240119001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

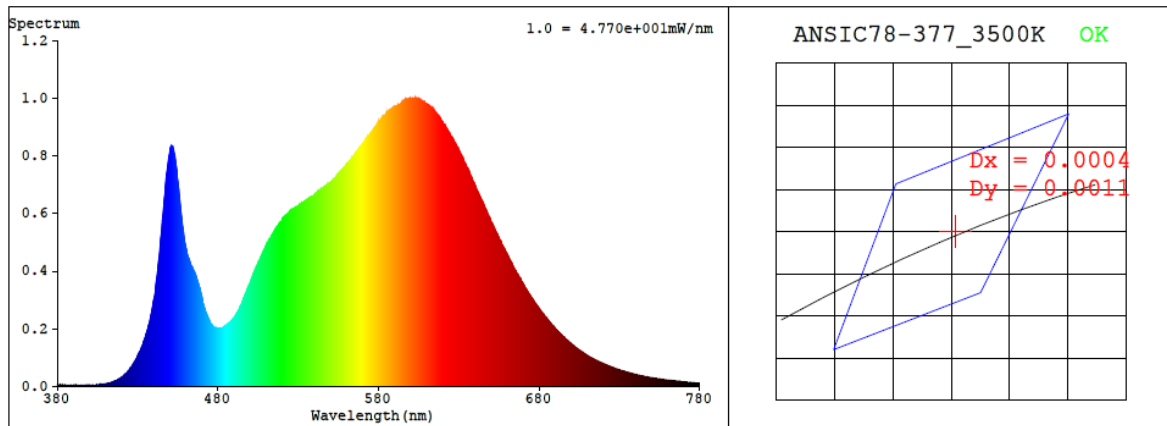
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.989
277.0	60	0.079	19.6	0.899

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3413	83.4	13	0.0004	85	97	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4107$ $y = 0.3942$ / $u' = 0.2378$ $v' = 0.5135$ ($duv=3.77e-04$)

CCT= 3413K Prcp WL: $L_d=581.0nm$ Purity=41.6%

Peak WL: $L_p=603nm$ FWHM: $=145.6nm$ Ratio:R=20.7% G=76.5% B=2.8%

Render Index: $R_a = 83.4$ AvgR = 77.2 TM30:Rf=84 Rg=97

EEL: 0.10463 A++ Highest

R1 =82 R2 =90 R3 =95 R4 =83 R5 =82 R6 =86 R7 =86

R8 =64 R9 =13 R10=75 R11=82 R12=64 R13=84 R14=97 R15=76

4.1 Integrating Sphere Test

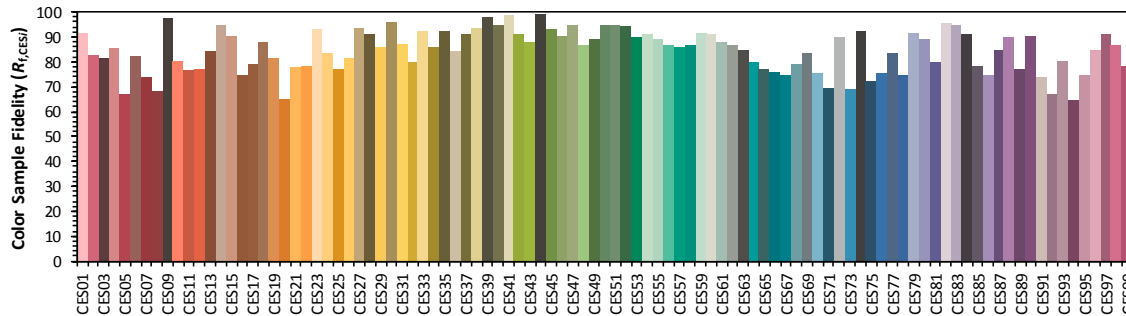
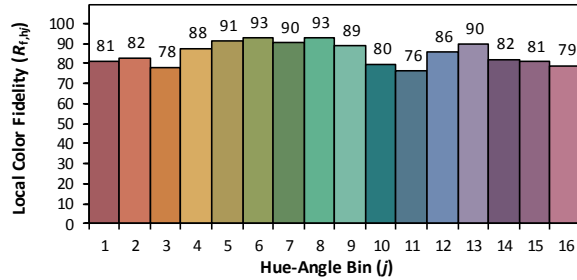
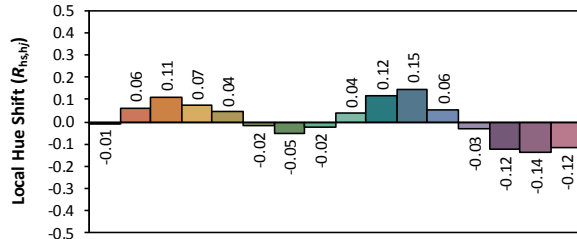
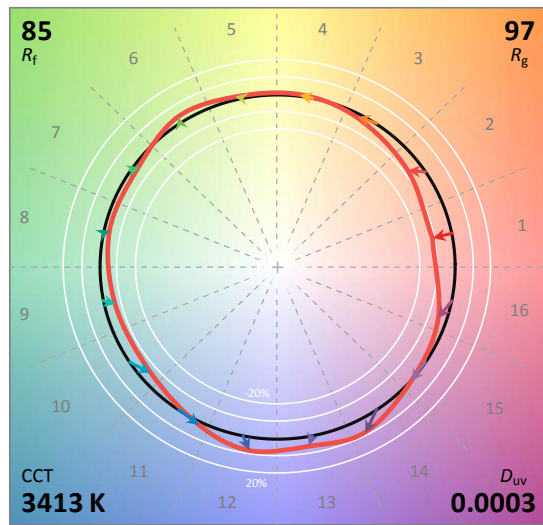
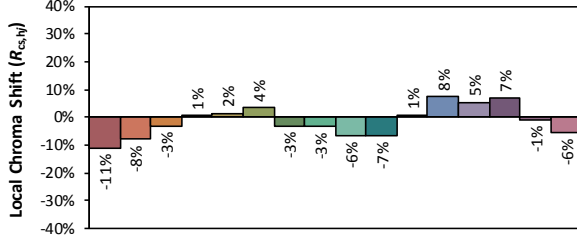
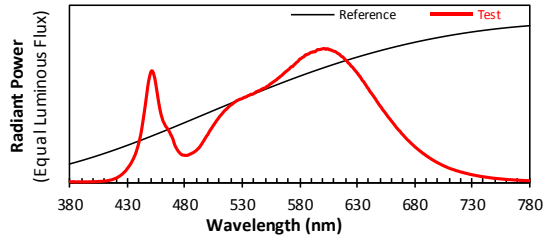
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/1/30

Model: C-SWISH2X2@20W3500K



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

x 0.4107
 y 0.3941
 u' 0.2378
 v' 0.5135

CIE 13.3-1995
(CRI)

R_a 83
 R_g 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	5.20E-06	447	6.76E-04	514	5.29E-04	581	9.23E-04	648	5.98E-04	715	9.20E-05
381	3.80E-06	448	7.39E-04	515	5.38E-04	582	9.31E-04	649	5.85E-04	716	8.88E-05
382	3.80E-06	449	7.82E-04	516	5.45E-04	583	9.36E-04	650	5.73E-04	717	8.59E-05
383	5.50E-06	450	8.17E-04	517	5.54E-04	584	9.41E-04	651	5.62E-04	718	8.42E-05
384	2.20E-06	451	8.33E-04	518	5.63E-04	585	9.52E-04	652	5.49E-04	719	8.09E-05
385	2.80E-06	452	8.27E-04	519	5.70E-04	586	9.52E-04	653	5.36E-04	720	7.86E-05
386	3.30E-06	453	8.01E-04	520	5.79E-04	587	9.57E-04	654	5.27E-04	721	7.60E-05
387	3.80E-06	454	7.64E-04	521	5.82E-04	588	9.60E-04	655	5.14E-04	722	7.43E-05
388	3.30E-06	455	7.12E-04	522	5.89E-04	589	9.66E-04	656	5.03E-04	723	7.21E-05
389	2.60E-06	456	6.58E-04	523	5.97E-04	590	9.71E-04	657	4.91E-04	724	6.95E-05
390	3.20E-06	457	6.03E-04	524	6.02E-04	591	9.72E-04	658	4.81E-04	725	6.71E-05
391	2.40E-06	458	5.55E-04	525	6.10E-04	592	9.76E-04	659	4.70E-04	726	6.56E-05
392	3.10E-06	459	5.14E-04	526	6.13E-04	593	9.75E-04	660	4.59E-04	727	6.30E-05
393	3.50E-06	460	4.84E-04	527	6.17E-04	594	9.79E-04	661	4.48E-04	728	6.09E-05
394	3.40E-06	461	4.56E-04	528	6.22E-04	595	9.88E-04	662	4.37E-04	729	5.91E-05
395	2.50E-06	462	4.40E-04	529	6.22E-04	596	9.92E-04	663	4.27E-04	730	5.74E-05
396	3.50E-06	463	4.22E-04	530	6.27E-04	597	9.91E-04	664	4.14E-04	731	5.53E-05
397	3.90E-06	464	4.11E-04	531	6.31E-04	598	9.92E-04	665	4.04E-04	732	5.38E-05
398	4.00E-06	465	3.99E-04	532	6.36E-04	599	9.96E-04	666	3.94E-04	733	5.25E-05
399	4.00E-06	466	3.85E-04	533	6.37E-04	600	9.97E-04	667	3.85E-04	734	5.04E-05
400	4.30E-06	467	3.69E-04	534	6.42E-04	601	1.00E-03	668	3.76E-04	735	4.90E-05
401	4.70E-06	468	3.50E-04	535	6.47E-04	602	9.98E-04	669	3.65E-04	736	4.70E-05
402	5.00E-06	469	3.34E-04	536	6.50E-04	603	9.93E-04	670	3.56E-04	737	4.57E-05
403	5.30E-06	470	3.10E-04	537	6.56E-04	604	9.98E-04	671	3.46E-04	738	4.42E-05
404	5.80E-06	471	2.82E-04	538	6.58E-04	605	9.97E-04	672	3.37E-04	739	4.24E-05
405	6.40E-06	472	2.63E-04	539	6.59E-04	606	9.90E-04	673	3.27E-04	740	4.15E-05
406	6.60E-06	473	2.48E-04	540	6.62E-04	607	9.90E-04	674	3.18E-04	741	4.04E-05
407	7.10E-06	474	2.35E-04	541	6.69E-04	608	9.86E-04	675	3.10E-04	742	3.91E-05
408	7.70E-06	475	2.24E-04	542	6.76E-04	609	9.82E-04	676	3.02E-04	743	3.76E-05
409	8.50E-06	476	2.15E-04	543	6.78E-04	610	9.80E-04	677	2.93E-04	744	3.70E-05
410	9.20E-06	477	2.08E-04	544	6.84E-04	611	9.77E-04	678	2.86E-04	745	3.54E-05
411	1.03E-05	478	2.04E-04	545	6.84E-04	612	9.72E-04	679	2.78E-04	746	3.38E-05
412	1.14E-05	479	2.03E-04	546	6.91E-04	613	9.65E-04	680	2.70E-04	747	3.33E-05
413	1.22E-05	480	2.01E-04	547	6.96E-04	614	9.60E-04	681	2.62E-04	748	3.17E-05
414	1.52E-05	481	2.02E-04	548	7.00E-04	615	9.55E-04	682	2.55E-04	749	3.07E-05
415	1.65E-05	482	2.01E-04	549	7.04E-04	616	9.45E-04	683	2.47E-04	750	2.97E-05
416	1.85E-05	483	2.04E-04	550	7.05E-04	617	9.40E-04	684	2.41E-04	751	2.89E-05
417	2.10E-05	484	2.09E-04	551	7.13E-04	618	9.34E-04	685	2.33E-04	752	2.83E-05
418	2.49E-05	485	2.12E-04	552	7.19E-04	619	9.24E-04	686	2.28E-04	753	2.72E-05
419	2.76E-05	486	2.17E-04	553	7.23E-04	620	9.16E-04	687	2.20E-04	754	2.65E-05
420	3.16E-05	487	2.21E-04	554	7.32E-04	621	9.08E-04	688	2.14E-04	755	2.60E-05
421	3.50E-05	488	2.26E-04	555	7.38E-04	622	8.97E-04	689	2.08E-04	756	2.46E-05
422	4.12E-05	489	2.32E-04	556	7.43E-04	623	8.88E-04	690	2.02E-04	757	2.41E-05
423	4.53E-05	490	2.38E-04	557	7.50E-04	624	8.80E-04	691	1.96E-04	758	2.34E-05
424	5.21E-05	491	2.48E-04	558	7.55E-04	625	8.67E-04	692	1.89E-04	759	2.29E-05
425	5.86E-05	492	2.56E-04	559	7.62E-04	626	8.62E-04	693	1.84E-04	760	2.18E-05
426	6.62E-05	493	2.66E-04	560	7.68E-04	627	8.50E-04	694	1.79E-04	761	2.10E-05
427	7.52E-05	494	2.79E-04	561	7.76E-04	628	8.40E-04	695	1.72E-04	762	2.07E-05
428	8.27E-05	495	2.91E-04	562	7.82E-04	629	8.30E-04	696	1.68E-04	763	1.98E-05
429	9.38E-05	496	3.05E-04	563	7.90E-04	630	8.20E-04	697	1.62E-04	764	1.97E-05
430	1.05E-04	497	3.19E-04	564	7.96E-04	631	8.08E-04	698	1.58E-04	765	1.88E-05
431	1.17E-04	498	3.33E-04	565	8.03E-04	632	7.97E-04	699	1.52E-04	766	1.82E-05
432	1.29E-04	499	3.47E-04	566	8.12E-04	633	7.86E-04	700	1.47E-04	767	1.77E-05
433	1.42E-04	500	3.58E-04	567	8.20E-04	634	7.72E-04	701	1.43E-04	768	1.71E-05
434	1.59E-04	501	3.75E-04	568	8.27E-04	635	7.58E-04	702	1.39E-04	769	1.66E-05
435	1.75E-04	502	3.89E-04	569	8.34E-04	636	7.50E-04	703	1.34E-04	770	1.60E-05
436	1.94E-04	503	4.01E-04	570	8.41E-04	637	7.36E-04	704	1.30E-04	771	1.55E-05
437	2.14E-04	504	4.15E-04	571	8.47E-04	638	7.24E-04	705	1.26E-04	772	1.48E-05
438	2.41E-04	505	4.28E-04	572	8.57E-04	639	7.09E-04	706	1.22E-04	773	1.44E-05
439	2.69E-04	506	4.40E-04	573	8.64E-04	640	6.99E-04	707	1.18E-04	774	1.38E-05
440	3.02E-04	507	4.53E-04	574	8.65E-04	641	6.83E-04	708	1.14E-04	775	1.36E-05
441	3.37E-04	508	4.65E-04	575	8.77E-04	642	6.72E-04	709	1.11E-04	776	1.32E-05
442	3.81E-04	509	4.76E-04	576	8.84E-04	643	6.61E-04	710	1.07E-04	777	1.26E-05
443	4.35E-04	510	4.89E-04	577	8.93E-04	644	6.49E-04	711	1.04E-04	778	1.27E-05
444	4.91E-04	511	4.98E-04	578	9.00E-04	645	6.37E-04	712	1.00E-04	779	1.27E-05
445	5.50E-04	512	5.08E-04	579	9.07E-04	646	6.24E-04	713	9.76E-05	780	1.27E-05
446	6.12E-04	513	5.19E-04	580	9.20E-04	647	6.11E-04	714	9.49E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	C-SWISH2X2@20W3500K	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	19.6	0.899
NON-WORST CASE	120.0	60	0.161	19.1	0.989

Test Result

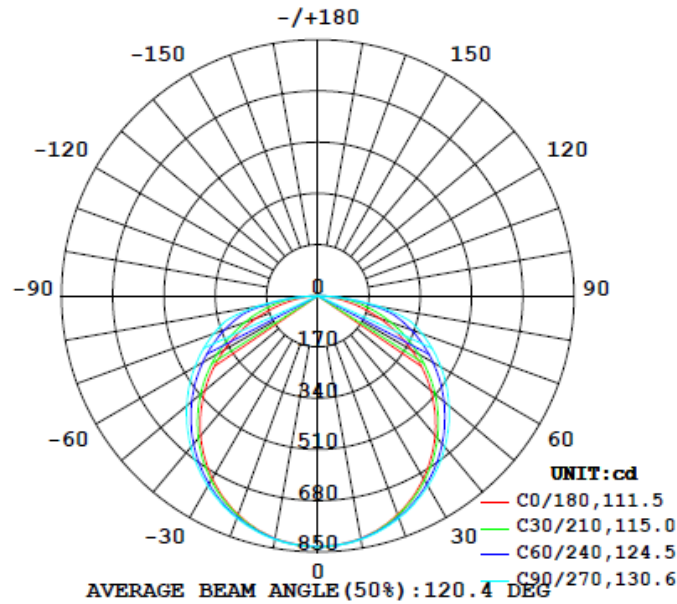
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement
	C0-180	C90-270	C0-180	C90-270		(0°-60°)
2606	161.0	169.8	111.5	130.6	133.0	74.6%

UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
18.8	22.0	1.26	1.32

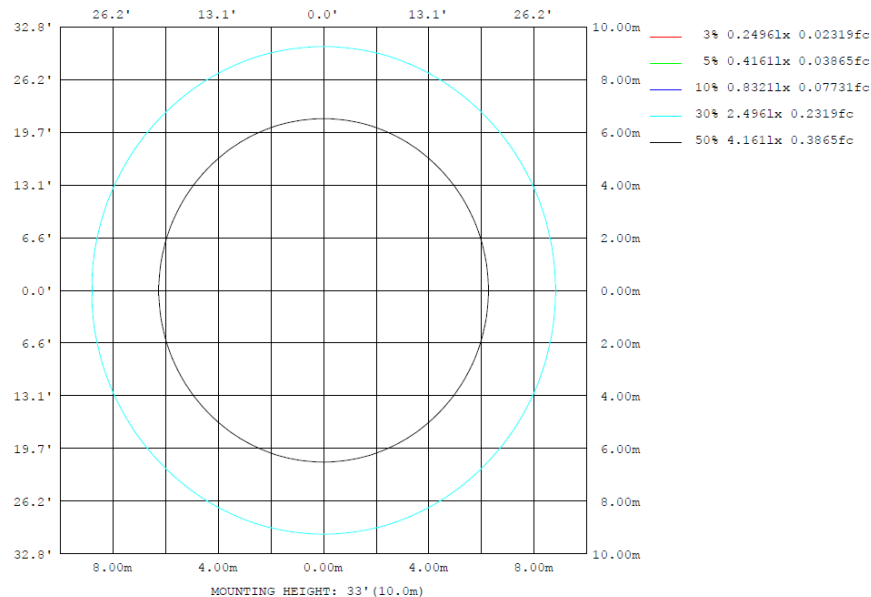
4.2 Goniophotometer Test

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	817.7	819.2	820.8	819.2	817.7	819.2	820.8	819.2	0- 10	78.82	78.82	3.02,3.02
20	772.3	779.1	785.5	779.1	772.3	779.1	785.5	779.1	10- 20	226.5	305.3	11.7,11.7
30	700.4	714.4	730.0	714.4	700.4	714.4	730.0	714.4	20- 30	345.7	651.0	25,25
40	604.7	628.8	655.1	628.8	604.7	628.8	655.1	628.8	30- 40	422.1	1073	41.2,41.2
50	489.7	526.1	568.0	526.1	489.7	526.1	568.0	526.1	40- 50	447.9	1521	58.4,58.4
60	358.6	412.5	471.0	412.5	358.6	412.5	471.0	412.5	50- 60	422.0	1943	74.6,74.6
70	217.7	293.8	367.8	293.8	217.7	293.8	367.8	293.8	60- 70	350.2	2293	88,88
80	82.38	165.8	204.5	165.8	82.38	165.8	204.5	165.8	70- 80	241.1	2534	97.3,97.3
90	0	0	0	0	0	0	0	0	80- 90	71.37	2606	100,100
100	0	0	0	0	0	0	0	0	90-100	0	2606	100,100
110	0	0	0	0	0	0	0	0	100-110	0	2606	100,100
120	0	0	0	0	0	0	0	0	110-120	0	2606	100,100
130	0	0	0	0	0	0	0	0	120-130	0	2606	100,100
140	0	0	0	0	0	0	0	0	130-140	0	2606	100,100
150	0	0	0	0	0	0	0	0	140-150	0	2606	100,100
160	0	0	0	0	0	0	0	0	150-160	0	2606	100,100
170	0	0	0	0	0	0	0	0	160-170	0	2606	100,100
180	0	0	0	0	0	0	0	0	170-180	0	2606	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	78.82	0-10	78.82	3.02%
10-20	226.50	0-20	305.32	11.72%
20-30	345.72	0-30	651.04	24.99%
30-40	422.11	0-40	1073.15	41.18%
40-50	447.87	0-50	1521.02	58.37%
50-60	422.00	0-60	1943.02	74.57%
60-70	350.25	0-70	2293.27	88.01%
70-80	241.06	0-80	2534.33	97.26%
80-90	71.37	0-90	2605.70	100.00%
90-100	0.00	0-100	2605.70	100.00%
100-110	0.00	0-110	2605.70	100.00%
110-120	0.00	0-120	2605.70	100.00%
120-130	0.00	0-130	2605.70	100.00%
130-140	0.00	0-140	2605.70	100.00%
140-150	0.00	0-150	2605.70	100.00%
150-160	0.00	0-160	2605.70	100.00%
160-170	0.00	0-170	2605.70	100.00%
170-180	0.00	0-180	2605.70	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	11.1	12.8	11.4	13.1	13.4	12.4	14.1	12.7	14.4	14.7
	3H	12.8	14.4	13.2	14.7	15.1	14.9	16.5	15.3	16.8	17.1
	4H	13.5	14.9	13.9	15.3	15.7	16.1	17.6	16.5	17.9	18.3
	6H	13.9	15.3	14.3	15.6	16.0	17.1	18.5	17.5	18.8	19.2
	8H	14.0	15.3	14.5	15.7	16.1	17.4	18.7	17.8	19.1	19.5
	12H	14.1	15.3	14.5	15.7	16.2	17.6	18.8	18.0	19.2	19.7
4H	2H	12.0	13.4	12.4	13.8	14.2	13.0	14.4	13.4	14.8	15.1
	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	16.8	17.2	18.3	17.6	18.7	19.1
	6H	15.4	16.4	15.8	16.8	17.2	18.3	19.3	18.8	19.8	20.2
	8H	15.5	16.5	16.0	16.9	17.4	18.7	19.6	19.2	20.1	20.5
	12H	15.6	16.5	16.1	16.9	17.4	19.0	19.8	19.4	20.3	20.7
8H	4H	15.5	16.4	16.0	16.9	17.3	17.5	18.4	18.0	18.9	19.3
	6H	16.3	17.0	16.8	17.5	18.0	18.8	19.6	19.3	20.1	20.6
	8H	16.5	17.2	17.0	17.7	18.2	19.3	20.0	19.8	20.5	21.0
	12H	16.7	17.3	17.2	17.8	18.4	19.6	20.3	20.1	20.7	21.3
12H	4H	15.7	16.5	16.1	17.0	17.4	17.6	18.4	18.0	18.9	19.3
	6H	16.5	17.2	17.0	17.7	18.2	18.9	19.6	19.4	20.1	20.6
	8H	16.8	17.5	17.3	17.9	18.5	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	14.7	16.4	16.7	15.7	17.4	16.0	17.7	18.0
	3H	16.1	17.7	16.5	18.0	18.4	18.2	19.8	18.6	20.1	20.4
	4H	16.8	18.2	17.2	18.6	19.0	19.4	20.9	19.8	21.2	21.6
	6H	17.2	18.6	17.6	18.9	19.3	20.4	21.8	20.8	22.1	22.5
	8H	17.3	18.6	17.8	19.0	19.4	20.7	22.0	21.1	22.4	22.8
	12H	17.4	18.6	17.8	19.0	19.5	20.9	22.1	21.3	22.5	23.0
4H	2H	15.3	16.7	15.7	17.1	17.5	16.3	17.7	16.7	18.1	18.4
	3H	17.3	18.5	17.7	18.9	19.3	19.1	20.3	19.5	20.7	21.1
	4H	18.1	19.2	18.5	19.6	20.1	20.5	21.6	20.9	22.0	22.4
	6H	18.7	19.7	19.1	20.1	20.5	21.6	22.6	22.1	23.1	23.5
	8H	18.8	19.8	19.3	20.2	20.7	22.0	22.9	22.5	23.4	23.8
	12H	18.9	19.8	19.4	20.2	20.7	22.3	23.1	22.7	23.6	24.0
8H	4H	18.8	19.7	19.3	20.2	20.6	20.8	21.7	21.3	22.2	22.6
	6H	19.6	20.3	20.1	20.8	21.3	22.1	22.9	22.6	23.4	23.9
	8H	19.8	20.5	20.3	21.0	21.5	22.6	23.3	23.1	23.8	24.3
	12H	20.0	20.6	20.5	21.1	21.7	22.9	23.6	23.4	24.0	24.6
12H	4H	19.0	19.8	19.4	20.3	20.7	20.9	21.7	21.3	22.2	22.6
	6H	19.8	20.5	20.3	21.0	21.5	22.2	22.9	22.7	23.4	23.9
	8H	20.1	20.8	20.6	21.2	21.8	22.7	23.3	23.2	23.8	24.4

Maximum UGR = 24.6

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	832	832	833	831	832	832	833	832	832	831	833	832	832	832	833	831	832	832	833
5	828	829	829	829	829	830	830	830	829	829	829	829	828	829	829	829	829	830	830
10	818	818	819	819	819	820	821	820	819	819	819	818	818	818	819	819	819	820	821
15	799	800	801	802	803	805	806	805	803	802	801	800	799	800	801	802	803	805	806
20	772	774	776	779	782	784	786	784	782	779	776	774	772	774	776	779	782	784	786
25	740	742	745	749	755	759	760	759	755	749	745	742	740	742	745	749	755	759	760
30	700	702	708	714	722	727	730	727	722	714	708	702	700	702	708	714	722	727	730
35	655	658	665	674	684	692	694	692	684	674	665	658	655	658	665	674	684	692	694
40	605	608	617	629	641	652	655	652	641	629	617	608	605	608	617	629	641	652	655
45	549	554	564	579	595	608	613	608	595	579	564	554	549	554	564	579	595	608	613
50	490	495	507	526	547	563	568	563	547	526	507	495	490	495	507	526	547	563	568
55	426	432	447	471	495	514	520	514	495	471	447	432	426	432	447	471	495	514	520
60	359	366	385	413	441	463	471	463	441	413	385	366	359	366	385	413	441	463	471
65	289	298	322	354	385	410	420	410	385	354	322	298	289	298	322	354	385	410	420
70	218	228	258	294	329	357	368	357	329	294	258	228	218	228	258	294	329	357	368
75	147	161	195	233	271	301	313	301	271	233	195	161	147	161	195	233	271	301	313
80	82.4	98.6	132	166	184	198	205	198	184	166	132	98.6	82.4	98.6	132	166	184	198	205
85	29.8	39.5	57.7	68.2	73.2	77.2	80.4	77.2	73.2	68.2	57.7	39.5	29.8	39.5	57.7	68.2	73.2	77.2	80.4
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	832	832	831	833	832														
5	830	829	829	829	829														
10	820	819	819	819	818														
15	805	803	802	801	800														
20	784	782	779	776	774														
25	759	755	749	745	742														
30	727	722	714	708	702														
35	692	684	674	665	658														
40	652	641	629	617	608														
45	608	595	579	564	554														
50	563	547	526	507	495														
55	514	495	471	447	432														
60	463	441	413	385	366														
65	410	385	354	322	298														
70	357	329	294	258	228														
75	301	271	233	195	161														
80	198	184	166	132	98.6														
85	77.2	73.2	68.2	57.7	39.5														
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@20W3500K	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 $25 \pm 1^{\circ}\text{C}$. 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	0.161	19.1	0.989	11.86
277.0	60	0.079	19.6	0.899	14.46

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*****