

## 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.**

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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		2671
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	138.4
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.3
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	11.76
			277V	14.52
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.989
			277V	0.896
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4062
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		84.7
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		19
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%		-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	22.1
		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		0.078
(Goniophotometer – Section 4.2)		Non-Worst Case		0.157
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.3
(Goniophotometer – Section 4.2)		Non-Worst Case		18.6

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-01-25	C-SWISH2X2@20W4000K	240119001-S1
2	Goniophotometer Test	2024-01-25	C-SWISH2X2@20W4000K	240119001-S1
3	THD and PF Test	2024-01-25	C-SWISH2X2@20W4000K	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@20W4000K, 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

<b>Model No.</b>	C-SWISH2X2@20W4000K	<b>Sample ID</b>	240119001-S1
<b>Operate time (Min.)</b>	10	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

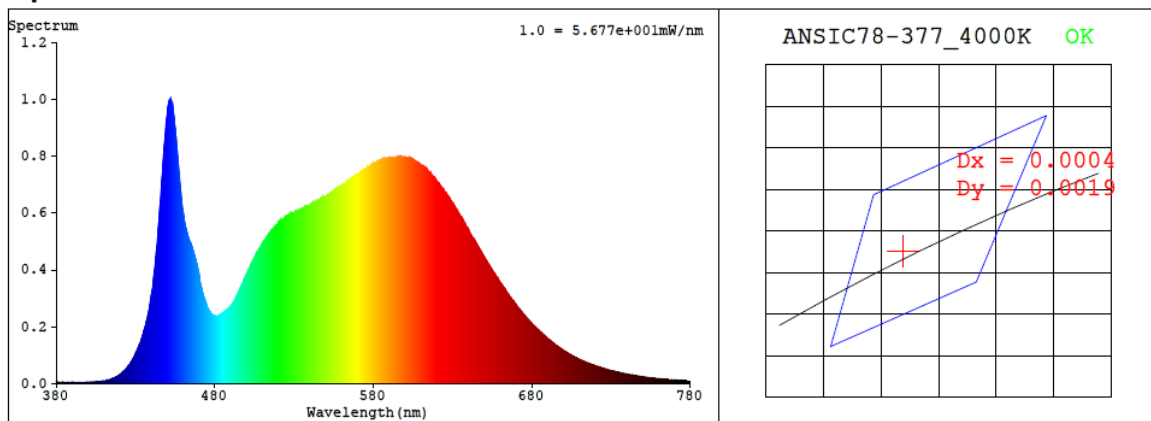
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.157	18.6	0.989
277.0	60	0.078	19.3	0.896

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4062	84.7	19	0.0007	85	96	-11%

## 4.1 Integrating Sphere Test



## Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3782$   $y = 0.3769$  /  $u' = 0.2236$   $v' = 0.5013$  ( $duv=7.45e-04$ )

CCT= 4062K      Prcp WL:   Ld=578.4nm      Purity=26.6%

Peak WL: Lp=452nm FWHM: =20.2nm Ratio:R=18.4% G=78.0% B=3.7%

Render Index: Ra = 84.7 AvgR = 78.4 TM30:Rf=85 Rg=96

EEl: 0.10037 A++ Highest

R1 =83    R2 =90    R3 =95    R4 =84    R5 =83    R6 =86    R7 =88

R8 =69      R9 =19      R10=76      R11=83      R12=61      R13=85      R14=97      R15=78

## 4.1 Integrating Sphere Test

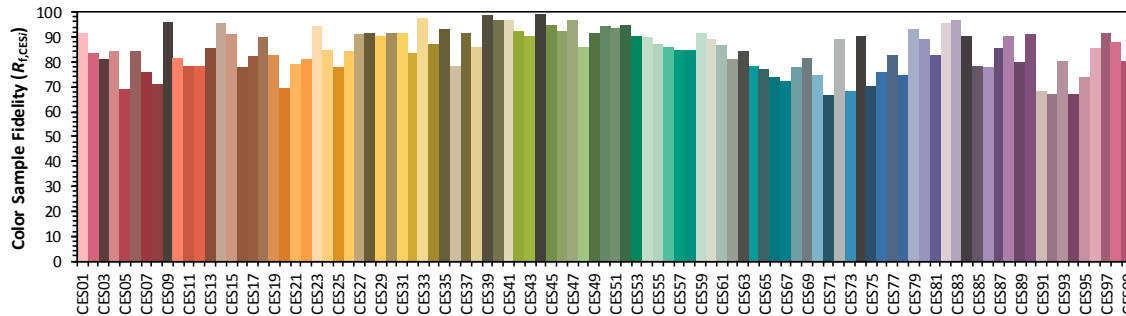
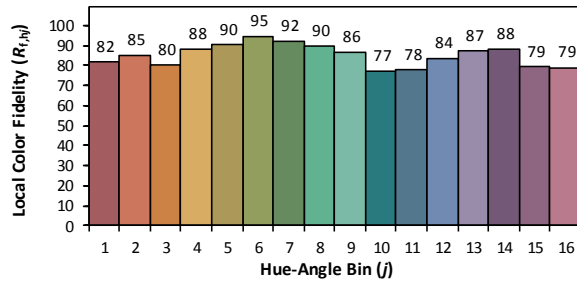
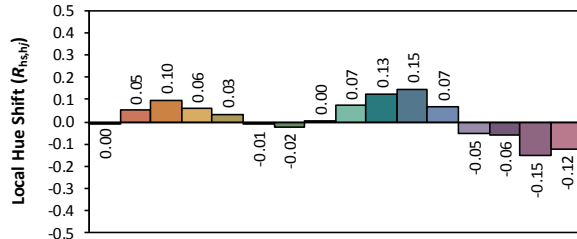
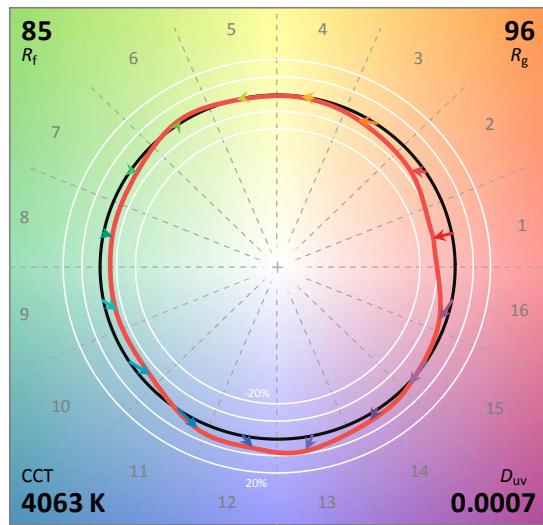
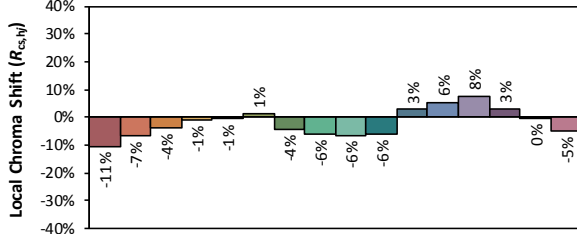
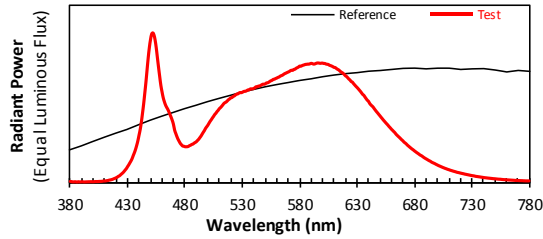
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/1/30

Model: C-SWISH2X2@20W4000K



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

$x$  0.3782  
 $y$  0.3768  
 $u'$  0.2236  
 $v'$  0.5013

CIE 13.3-1995  
(CRI)

$R_a$  85  
 $R_g$  19

## 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	6.80E-06	447	7.52E-04	514	5.27E-04	581	7.76E-04	648	4.64E-04	715	7.31E-05
381	5.50E-06	448	8.33E-04	515	5.33E-04	582	7.79E-04	649	4.54E-04	716	7.09E-05
382	4.00E-06	449	9.01E-04	516	5.37E-04	583	7.83E-04	650	4.45E-04	717	6.82E-05
383	3.40E-06	450	9.54E-04	517	5.45E-04	584	7.85E-04	651	4.35E-04	718	6.65E-05
384	4.30E-06	451	9.91E-04	518	5.53E-04	585	7.88E-04	652	4.26E-04	719	6.49E-05
385	3.80E-06	452	9.98E-04	519	5.58E-04	586	7.88E-04	653	4.17E-04	720	6.28E-05
386	2.40E-06	453	9.85E-04	520	5.65E-04	587	7.90E-04	654	4.08E-04	721	6.10E-05
387	4.50E-06	454	9.50E-04	521	5.67E-04	588	7.90E-04	655	3.99E-04	722	5.92E-05
388	3.40E-06	455	8.98E-04	522	5.74E-04	589	7.92E-04	656	3.91E-04	723	5.76E-05
389	3.70E-06	456	8.33E-04	523	5.77E-04	590	7.95E-04	657	3.82E-04	724	5.55E-05
390	4.20E-06	457	7.68E-04	524	5.84E-04	591	7.93E-04	658	3.73E-04	725	5.40E-05
391	4.10E-06	458	7.07E-04	525	5.89E-04	592	7.90E-04	659	3.65E-04	726	5.23E-05
392	3.00E-06	459	6.49E-04	526	5.91E-04	593	7.91E-04	660	3.56E-04	727	5.08E-05
393	3.20E-06	460	6.06E-04	527	5.96E-04	594	7.94E-04	661	3.48E-04	728	4.91E-05
394	3.70E-06	461	5.68E-04	528	6.00E-04	595	7.97E-04	662	3.40E-04	729	4.74E-05
395	3.90E-06	462	5.41E-04	529	5.99E-04	596	7.97E-04	663	3.33E-04	730	4.58E-05
396	4.30E-06	463	5.19E-04	530	6.02E-04	597	7.97E-04	664	3.23E-04	731	4.46E-05
397	4.40E-06	464	5.02E-04	531	6.06E-04	598	7.95E-04	665	3.15E-04	732	4.36E-05
398	4.90E-06	465	4.89E-04	532	6.08E-04	599	7.96E-04	666	3.07E-04	733	4.16E-05
399	4.60E-06	466	4.72E-04	533	6.09E-04	600	7.96E-04	667	3.00E-04	734	4.00E-05
400	4.20E-06	467	4.53E-04	534	6.13E-04	601	7.94E-04	668	2.93E-04	735	3.92E-05
401	5.10E-06	468	4.34E-04	535	6.18E-04	602	7.94E-04	669	2.85E-04	736	3.79E-05
402	5.90E-06	469	4.13E-04	536	6.18E-04	603	7.90E-04	670	2.78E-04	737	3.69E-05
403	5.80E-06	470	3.88E-04	537	6.24E-04	604	7.89E-04	671	2.69E-04	738	3.55E-05
404	5.80E-06	471	3.50E-04	538	6.24E-04	605	7.87E-04	672	2.64E-04	739	3.44E-05
405	6.40E-06	472	3.27E-04	539	6.25E-04	606	7.82E-04	673	2.57E-04	740	3.32E-05
406	6.80E-06	473	3.06E-04	540	6.28E-04	607	7.80E-04	674	2.49E-04	741	3.20E-05
407	7.10E-06	474	2.88E-04	541	6.32E-04	608	7.77E-04	675	2.42E-04	742	3.11E-05
408	7.90E-06	475	2.74E-04	542	6.39E-04	609	7.73E-04	676	2.36E-04	743	3.02E-05
409	9.20E-06	476	2.60E-04	543	6.38E-04	610	7.68E-04	677	2.29E-04	744	2.92E-05
410	9.50E-06	477	2.51E-04	544	6.43E-04	611	7.67E-04	678	2.23E-04	745	2.84E-05
411	1.04E-05	478	2.43E-04	545	6.44E-04	612	7.61E-04	679	2.18E-04	746	2.76E-05
412	1.18E-05	479	2.42E-04	546	6.47E-04	613	7.56E-04	680	2.11E-04	747	2.67E-05
413	1.29E-05	480	2.39E-04	547	6.52E-04	614	7.51E-04	681	2.06E-04	748	2.59E-05
414	1.53E-05	481	2.38E-04	548	6.56E-04	615	7.45E-04	682	2.00E-04	749	2.50E-05
415	1.67E-05	482	2.39E-04	549	6.56E-04	616	7.38E-04	683	1.95E-04	750	2.45E-05
416	1.88E-05	483	2.41E-04	550	6.58E-04	617	7.33E-04	684	1.89E-04	751	2.37E-05
417	2.10E-05	484	2.46E-04	551	6.64E-04	618	7.28E-04	685	1.83E-04	752	2.28E-05
418	2.45E-05	485	2.49E-04	552	6.65E-04	619	7.20E-04	686	1.79E-04	753	2.20E-05
419	2.74E-05	486	2.54E-04	553	6.68E-04	620	7.12E-04	687	1.74E-04	754	2.14E-05
420	3.11E-05	487	2.56E-04	554	6.74E-04	621	7.07E-04	688	1.68E-04	755	2.11E-05
421	3.53E-05	488	2.62E-04	555	6.79E-04	622	6.98E-04	689	1.63E-04	756	2.02E-05
422	4.08E-05	489	2.67E-04	556	6.82E-04	623	6.90E-04	690	1.59E-04	757	1.94E-05
423	4.47E-05	490	2.72E-04	557	6.88E-04	624	6.83E-04	691	1.54E-04	758	1.87E-05
424	5.16E-05	491	2.80E-04	558	6.89E-04	625	6.73E-04	692	1.50E-04	759	1.84E-05
425	5.84E-05	492	2.88E-04	559	6.93E-04	626	6.70E-04	693	1.45E-04	760	1.74E-05
426	6.52E-05	493	2.99E-04	560	6.96E-04	627	6.60E-04	694	1.41E-04	761	1.71E-05
427	7.39E-05	494	3.09E-04	561	7.01E-04	628	6.51E-04	695	1.36E-04	762	1.66E-05
428	8.36E-05	495	3.22E-04	562	7.04E-04	629	6.42E-04	696	1.32E-04	763	1.60E-05
429	9.29E-05	496	3.35E-04	563	7.09E-04	630	6.35E-04	697	1.29E-04	764	1.56E-05
430	1.06E-04	497	3.47E-04	564	7.13E-04	631	6.26E-04	698	1.25E-04	765	1.50E-05
431	1.17E-04	498	3.61E-04	565	7.16E-04	632	6.17E-04	699	1.21E-04	766	1.46E-05
432	1.31E-04	499	3.72E-04	566	7.21E-04	633	6.08E-04	700	1.17E-04	767	1.40E-05
433	1.44E-04	500	3.82E-04	567	7.26E-04	634	5.98E-04	701	1.13E-04	768	1.35E-05
434	1.60E-04	501	3.96E-04	568	7.30E-04	635	5.88E-04	702	1.10E-04	769	1.30E-05
435	1.81E-04	502	4.08E-04	569	7.33E-04	636	5.81E-04	703	1.06E-04	770	1.30E-05
436	2.00E-04	503	4.19E-04	570	7.37E-04	637	5.70E-04	704	1.03E-04	771	1.24E-05
437	2.22E-04	504	4.31E-04	571	7.41E-04	638	5.59E-04	705	9.95E-05	772	1.22E-05
438	2.49E-04	505	4.41E-04	572	7.46E-04	639	5.49E-04	706	9.65E-05	773	1.17E-05
439	2.79E-04	506	4.54E-04	573	7.49E-04	640	5.42E-04	707	9.34E-05	774	1.16E-05
440	3.16E-04	507	4.62E-04	574	7.48E-04	641	5.28E-04	708	9.08E-05	775	1.10E-05
441	3.53E-04	508	4.73E-04	575	7.54E-04	642	5.19E-04	709	8.76E-05	776	1.08E-05
442	4.02E-04	509	4.81E-04	576	7.56E-04	643	5.11E-04	710	8.53E-05	777	1.03E-05
443	4.61E-04	510	4.92E-04	577	7.62E-04	644	5.04E-04	711	8.25E-05	778	1.03E-05
444	5.24E-04	511	4.99E-04	578	7.66E-04	645	4.93E-04	712	7.99E-05	779	1.02E-05
445	5.96E-04	512	5.08E-04	579	7.70E-04	646	4.83E-04	713	7.77E-05	780	1.02E-05
446	6.70E-04	513	5.17E-04	580	7.77E-04	647	4.73E-04	714	7.51E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	C-SWISH2X2@20W4000K	<b>Sample ID</b>	240119001-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.0	<b>Humidity (%RH)</b>	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 <math>25 \pm 1^\circ\text{C}</math>, 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 <math>\pm 0.2</math> 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 <math>1.0^\circ</math> vertical intervals and <math>15^\circ</math> horizontal intervals.</p>

#### Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
<b>WORST CASE</b>	277.0	60	0.078	19.3	0.896
<b>NON-WORST CASE</b>	120.0	60	0.157	18.6	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°)
2671	160.9	169.9	111.3	130.8	138.4	74.6%

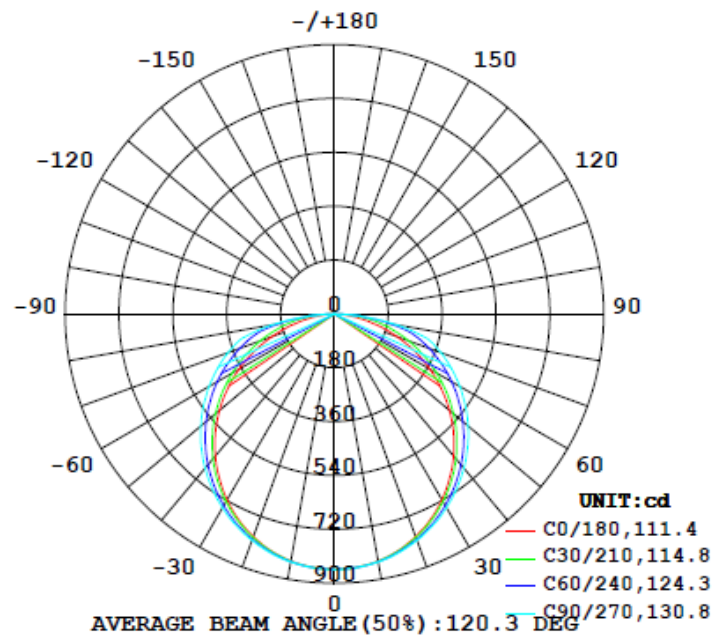
UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
18.9	22.1	1.26	1.32



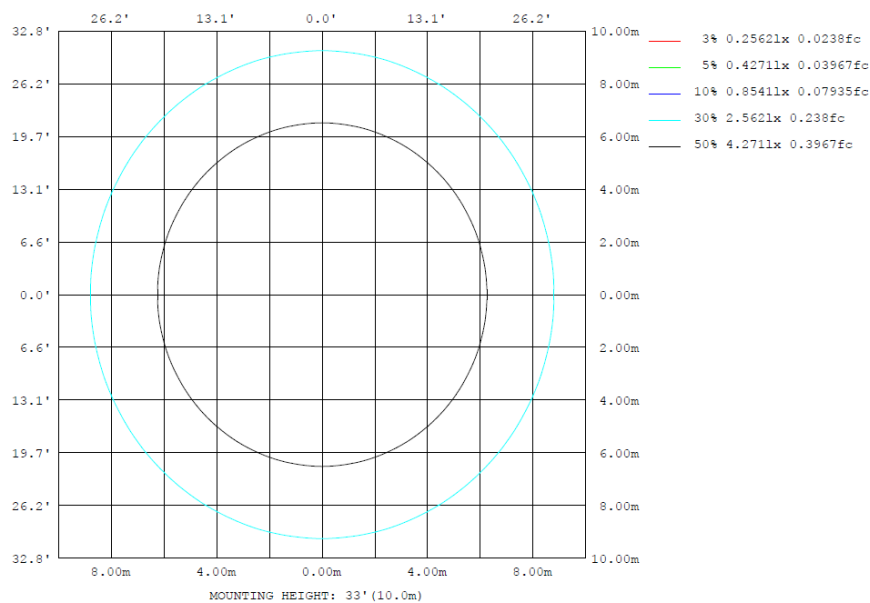
## 4.2 Goniophotometer Test

### 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	838.8	840.3	842.5	840.3	838.8	840.3	842.5	840.3	0- 10	80.86	80.86	3.03,3.03
20	792.7	799.0	805.2	799.0	792.7	799.0	805.2	799.0	10- 20	232.3	313.2	11.7,11.7
30	718.5	733.1	748.5	733.1	718.5	733.1	748.5	733.1	20- 30	354.5	667.7	25,25
40	619.2	644.6	673.2	644.6	619.2	644.6	673.2	644.6	30- 40	432.7	1100	41.2,41.2
50	502.2	539.1	583.4	539.1	502.2	539.1	583.4	539.1	40- 50	459.0	1559	58.4,58.4
60	367.1	422.4	483.9	422.4	367.1	422.4	483.9	422.4	50- 60	432.4	1992	74.6,74.6
70	222.7	300.9	378.1	300.9	222.7	300.9	378.1	300.9	60- 70	358.7	2351	88,88
80	84.17	170.1	211.4	170.1	84.17	170.1	211.4	170.1	70- 80	246.9	2597	97.2,97.2
90	0	0	0	0	0	0	0	0	80- 90	73.53	2671	100,100
100	0	0	0	0	0	0	0	0	90-100	0	2671	100,100
110	0	0	0	0	0	0	0	0	100-110	0	2671	100,100
120	0	0	0	0	0	0	0	0	110-120	0	2671	100,100
130	0	0	0	0	0	0	0	0	120-130	0	2671	100,100
140	0	0	0	0	0	0	0	0	130-140	0	2671	100,100
150	0	0	0	0	0	0	0	0	140-150	0	2671	100,100
160	0	0	0	0	0	0	0	0	150-160	0	2671	100,100
170	0	0	0	0	0	0	0	0	160-170	0	2671	100,100
180	0	0	0	0	0	0	0	0	170-180	0	2671	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	80.86	0-10	80.86	3.03%
10-20	232.34	0-20	313.20	11.73%
20-30	354.49	0-30	667.69	25.00%
30-40	432.75	0-40	1100.44	41.20%
40-50	459.02	0-50	1559.46	58.39%
50-60	432.40	0-60	1991.86	74.57%
60-70	358.70	0-70	2350.56	88.00%
70-80	246.88	0-80	2597.44	97.25%
80-90	73.53	0-90	2670.97	100.00%
90-100	0.00	0-100	2670.97	100.00%
100-110	0.00	0-110	2670.97	100.00%
110-120	0.00	0-120	2670.97	100.00%
120-130	0.00	0-130	2670.97	100.00%
130-140	0.00	0-140	2670.97	100.00%
140-150	0.00	0-150	2670.97	100.00%
150-160	0.00	0-160	2670.97	100.00%
160-170	0.00	0-170	2670.97	100.00%
170-180	0.00	0-180	2670.97	100.00%

## 4.2 Goniophotometer Test

UGR – Uncorrected Table:

**UGR TABLE - UNCORRECTED**

Reflectances		70	70	50	50	30	70	70	50	50	30
Ceiling Cavity		50	30	50	30	30	50	30	50	30	30
Walls		20	20	20	20	20	20	20	20	20	20
Floor Cavity											
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	15.6	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	14.4	15.7	16.1	17.4	18.7	17.8	19.1	19.5
	12H	14.1	15.3	14.5	15.7	16.1	17.6	18.9	18.1	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	16.3	15.8	16.8	17.2	18.3	19.3	18.8	19.8	20.2
	8H	15.5	16.4	16.0	16.9	17.3	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	19.5	20.3	20.7
8H	4H	15.5	16.4	15.9	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	18.3	19.6	20.3	20.2	20.8	21.3
12H	4H	15.6	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	17.6	18.2	18.9	19.6	19.4	20.1	20.6
	8H	16.8	17.4	17.3	17.9	18.5	19.4	20.1	19.9	20.5	21.1

Maximum UGR = 21.3

UGR – Corrected Table:

**UGR TABLE - CORRECTED**

Reflectances		70	70	50	50	30	70	70	50	50	30
Ceiling Cavity		50	30	50	30	30	50	30	50	30	30
Walls		20	20	20	20	20	20	20	20	20	20
Floor Cavity											
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	14.5	16.2	14.8	16.5	16.8	15.8	17.5	16.1	17.8	18.1
	3H	16.2	17.8	16.6	18.1	18.5	18.3	19.9	18.7	20.2	20.5
	4H	16.9	18.3	17.3	18.7	19.0	19.5	21.0	19.9	21.3	21.7
	6H	17.3	18.7	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	17.5	18.7	17.9	19.1	19.5	21.0	22.3	21.5	22.6	23.1
4H	2H	15.4	16.8	15.8	17.2	17.6	16.4	17.8	16.8	18.2	18.5
	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	20.2	20.6	21.7	21.0	22.1	22.5
	6H	18.8	19.7	19.2	20.2	20.6	21.7	22.7	22.2	23.2	23.6
	8H	18.9	19.8	19.4	20.3	20.7	22.1	23.0	22.6	23.5	23.9
	12H	19.0	19.9	19.5	20.3	20.8	22.4	23.2	22.9	23.7	24.1
8H	4H	18.9	19.8	19.3	20.3	20.7	20.9	21.8	21.4	22.3	22.7
	6H	19.7	20.4	20.2	20.9	21.4	22.2	23.0	22.7	23.5	24.0
	8H	19.9	20.6	20.4	21.1	21.6	22.7	23.4	23.2	23.9	24.4
	12H	20.1	20.7	20.6	21.2	21.7	23.0	23.7	23.6	24.2	24.7
12H	4H	19.0	19.9	19.5	20.4	20.8	21.0	21.8	21.4	22.3	22.7
	6H	19.9	20.6	20.4	21.0	21.6	22.3	23.0	22.8	23.5	24.0
	8H	20.2	20.8	20.7	21.3	21.9	22.8	23.5	23.3	23.9	24.5

Maximum UGR = 24.7

## 4.2 Goniophotometer Test

### Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
γ (DEG)	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854
5	850	850	850	851	851	851	851	851	851	851	850	850	850	850	850	851	851	851	851
10	839	839	840	840	841	841	841	841	840	840	839	839	839	839	840	840	841	841	842
15	820	820	821	824	825	826	827	826	825	824	821	820	820	820	821	824	825	826	827
20	793	793	796	799	802	805	805	805	802	799	796	793	793	793	796	799	802	805	805
25	758	760	763	769	774	778	779	778	774	769	763	760	758	760	763	769	774	778	779
30	719	720	725	733	740	746	749	746	740	733	725	720	719	720	725	733	740	746	749
35	671	674	681	691	702	709	713	709	702	691	681	674	671	674	681	691	702	709	713
40	619	623	632	645	658	669	673	669	658	645	632	623	619	623	632	645	658	669	673
45	563	566	578	594	611	625	630	625	611	594	578	566	563	566	578	594	611	625	630
50	502	506	520	539	560	577	583	577	560	539	520	506	502	506	520	539	560	577	583
55	436	442	458	482	507	527	535	527	507	482	458	442	436	442	458	482	507	527	535
60	367	374	394	422	452	475	484	475	452	422	394	374	367	374	394	422	452	475	484
65	296	304	329	362	395	420	431	420	395	362	329	304	296	304	329	362	395	420	431
70	223	234	263	301	337	365	378	365	337	301	263	234	223	234	263	301	337	365	378
75	151	165	199	239	278	308	322	308	278	239	199	165	151	165	199	239	278	308	322
80	84.2	101	135	170	189	203	211	203	189	170	135	101	84.2	101	135	170	189	203	211
85	30.3	40.5	59.3	70.5	76.1	80.1	84.1	80.1	76.1	70.5	59.3	40.5	30.3	40.5	59.3	70.5	76.1	80.1	84.1
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)	285	300	315	330	345														
γ (DEG)	854	854	854	854	854														
5	851	851	851	850	850														
10	841	841	840	840	839														
15	826	825	824	821	820														
20	805	802	799	796	793														
25	778	774	769	763	760														
30	746	740	733	725	720														
35	709	702	691	681	674														
40	669	658	645	632	623														
45	625	611	594	578	566														
50	577	560	539	520	506														
55	527	507	482	458	442														
60	475	452	422	394	374														
65	420	395	362	329	304														
70	365	337	301	263	234														
75	308	278	239	199	165														
80	203	189	170	135	101														
85	80.1	76.1	70.5	59.3	40.5														
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

<b>Model No.</b>	C-SWISH2X2@20W4000K	<b>Sample ID</b>	240119001-S1
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

<b>Test Method</b>
<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 <math>25 \pm 1^{\circ}\text{C}</math>. 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	0.157	18.6	0.989	11.76
277.0	60	0.078	19.3	0.896	14.52

## 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\*\*\*\*\*