

## 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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Issue Date: 2024-01-30  
Revised Date: N/A

## 1.0 Test Summary

DLC Technical Requirements V5.1

2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	IES LM-79-2008	1500		2828
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	140.7
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		20.1
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	11.22
			277V	14.16
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.991
			277V	0.899
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	4845
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		83.8
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		16
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		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%		74.1%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	19.9
		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		0.081
(Goniophotometer – Section 4.2)		Non-Worst Case		0.164
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		20.1
(Goniophotometer – Section 4.2)		Non-Worst Case		19.5

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-01-28	C-SWISH2X4@20W5000K	240119002-S1
2	Goniophotometer Test	2024-01-28	C-SWISH2X4@20W5000K	240119002-S1
3	THD and PF Test	2024-01-28	C-SWISH2X4@20W5000K	240119002-S1

### Remark (If any)

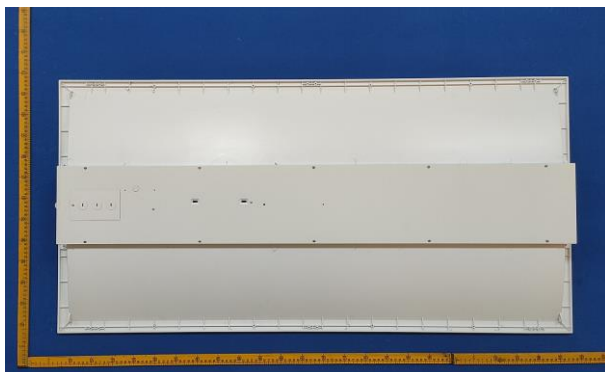
1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

## 3.0 Product Description

Luminaire Description: Model No. C-SWISH2X4@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

<b>Model No.</b>	C-SWISH2X4@20W5000K	<b>Sample ID</b>	240119002-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

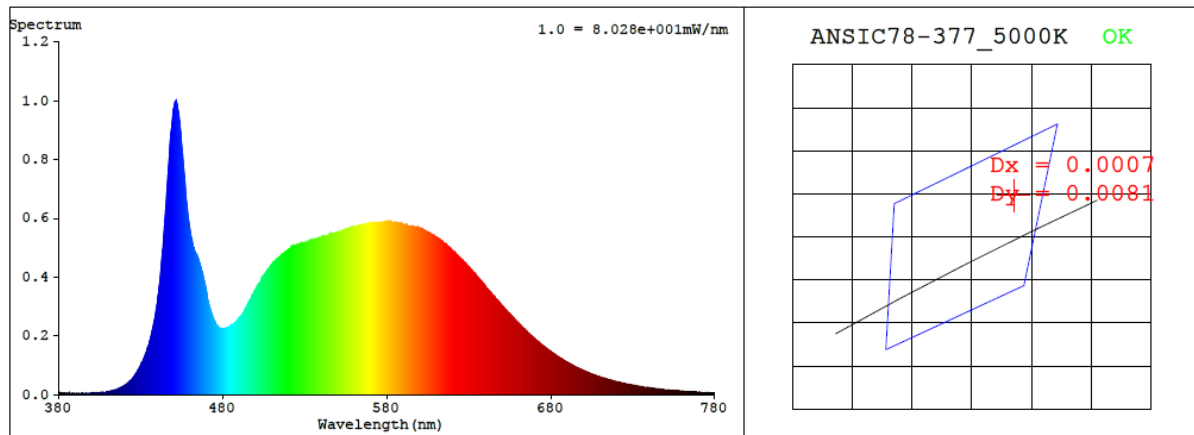
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.164	19.5	0.991
277.0	60	0.081	20.1	0.899

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4845	83.8	16	0.0037	84	96	-11%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3503$   $y = 0.3633$  /  $u' = 0.2104$   $v' = 0.4910$  ( $duv=3.71e-03$ )

CCT= 4845K Prcp WL: Ld=571.4nm Purity=14.1%

Peak WL: Lp=452nm FWHM: =19.0nm Ratio:R=16.0% G=79.6% B=4.4%

Render Index: Ra = 83.8 AvgR = 76.9 TM30:Rf=85 Rg=95

EEL: 0.09431 A++ Highest

R1 =82 R2 =89 R3 =93 R4 =82 R5 =81 R6 =84 R7 =89  
R8 =70 R9 =16 R10=73 R11=81 R12=55 R13=84 R14=97 R15=77

## 4.1 Integrating Sphere Test

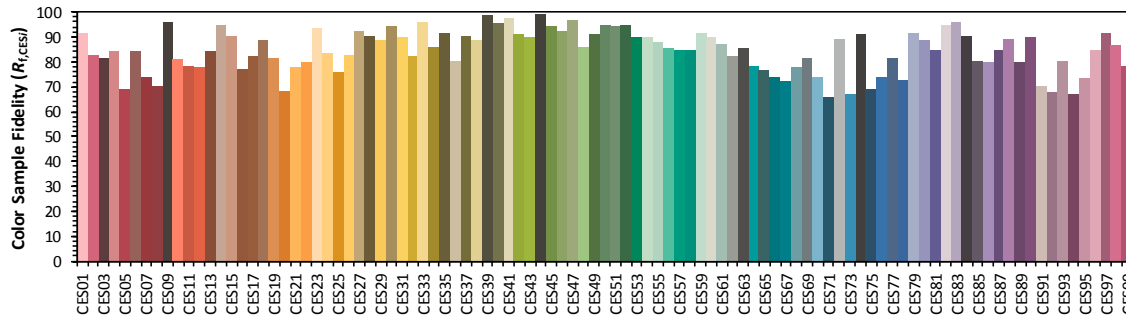
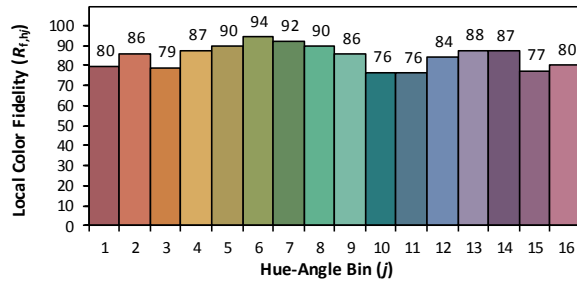
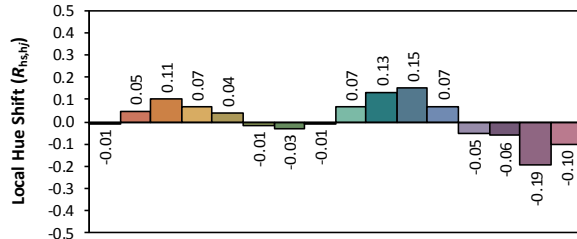
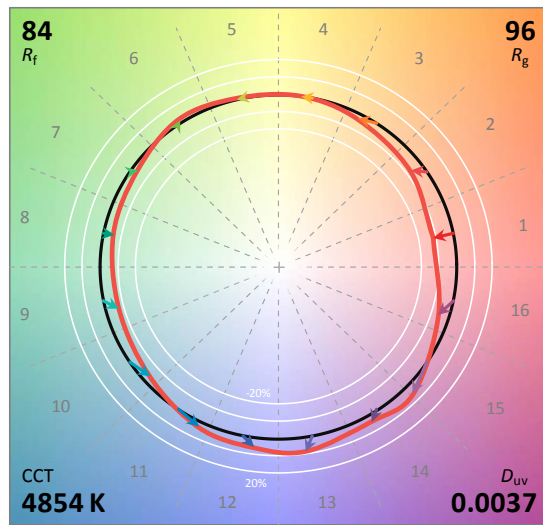
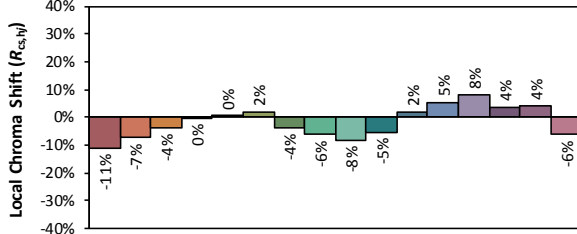
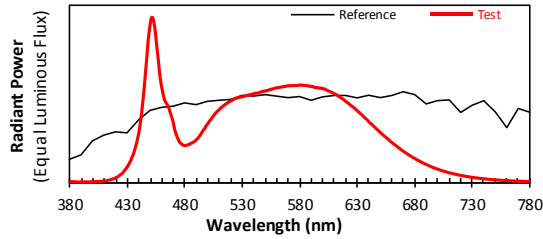
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/1/30

Model: C-SWISH2X4@20W5000K



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

$x$  0.3503  
 $y$  0.3631  
 $u'$  0.2105  
 $v'$  0.4909

CIE 13.3-1995  
(CRI)

$R_a$  84  
 $R_g$  16

## 4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	5.00E-06	447	7.72E-04	514	4.65E-04	581	5.88E-04	648	3.18E-04	715	5.18E-05
381	6.40E-06	448	8.60E-04	515	4.70E-04	582	5.88E-04	649	3.11E-04	716	5.00E-05
382	5.40E-06	449	9.16E-04	516	4.75E-04	583	5.86E-04	650	3.04E-04	717	4.88E-05
383	5.40E-06	450	9.69E-04	517	4.79E-04	584	5.86E-04	651	2.99E-04	718	4.73E-05
384	5.20E-06	451	9.95E-04	518	4.84E-04	585	5.85E-04	652	2.92E-04	719	4.57E-05
385	4.20E-06	452	9.91E-04	519	4.89E-04	586	5.85E-04	653	2.85E-04	720	4.43E-05
386	3.70E-06	453	9.62E-04	520	4.92E-04	587	5.84E-04	654	2.80E-04	721	4.30E-05
387	3.50E-06	454	9.19E-04	521	4.95E-04	588	5.80E-04	655	2.75E-04	722	4.20E-05
388	4.30E-06	455	8.51E-04	522	5.00E-04	589	5.82E-04	656	2.68E-04	723	4.05E-05
389	3.90E-06	456	7.87E-04	523	5.04E-04	590	5.79E-04	657	2.63E-04	724	3.93E-05
390	3.80E-06	457	7.23E-04	524	5.06E-04	591	5.78E-04	658	2.56E-04	725	3.79E-05
391	4.50E-06	458	6.55E-04	525	5.09E-04	592	5.78E-04	659	2.50E-04	726	3.64E-05
392	4.20E-06	459	6.04E-04	526	5.12E-04	593	5.73E-04	660	2.44E-04	727	3.57E-05
393	4.50E-06	460	5.66E-04	527	5.13E-04	594	5.72E-04	661	2.39E-04	728	3.44E-05
394	4.80E-06	461	5.31E-04	528	5.16E-04	595	5.73E-04	662	2.34E-04	729	3.34E-05
395	3.50E-06	462	5.04E-04	529	5.16E-04	596	5.73E-04	663	2.28E-04	730	3.23E-05
396	4.10E-06	463	4.86E-04	530	5.17E-04	597	5.69E-04	664	2.23E-04	731	3.11E-05
397	5.10E-06	464	4.76E-04	531	5.18E-04	598	5.68E-04	665	2.17E-04	732	3.03E-05
398	5.10E-06	465	4.63E-04	532	5.21E-04	599	5.70E-04	666	2.12E-04	733	2.95E-05
399	5.40E-06	466	4.48E-04	533	5.24E-04	600	5.66E-04	667	2.06E-04	734	2.85E-05
400	5.70E-06	467	4.27E-04	534	5.26E-04	601	5.65E-04	668	2.01E-04	735	2.76E-05
401	5.90E-06	468	4.04E-04	535	5.25E-04	602	5.63E-04	669	1.96E-04	736	2.66E-05
402	6.10E-06	469	3.83E-04	536	5.28E-04	603	5.59E-04	670	1.92E-04	737	2.57E-05
403	6.40E-06	470	3.56E-04	537	5.30E-04	604	5.56E-04	671	1.86E-04	738	2.52E-05
404	6.70E-06	471	3.22E-04	538	5.32E-04	605	5.52E-04	672	1.82E-04	739	2.43E-05
405	7.10E-06	472	2.99E-04	539	5.33E-04	606	5.50E-04	673	1.77E-04	740	2.36E-05
406	7.40E-06	473	2.79E-04	540	5.35E-04	607	5.47E-04	674	1.72E-04	741	2.28E-05
407	8.40E-06	474	2.63E-04	541	5.39E-04	608	5.43E-04	675	1.68E-04	742	2.20E-05
408	8.90E-06	475	2.48E-04	542	5.38E-04	609	5.40E-04	676	1.63E-04	743	2.13E-05
409	9.30E-06	476	2.39E-04	543	5.39E-04	610	5.36E-04	677	1.59E-04	744	2.07E-05
410	1.02E-05	477	2.33E-04	544	5.39E-04	611	5.33E-04	678	1.54E-04	745	1.99E-05
411	1.09E-05	478	2.26E-04	545	5.44E-04	612	5.29E-04	679	1.51E-04	746	1.94E-05
412	1.24E-05	479	2.25E-04	546	5.43E-04	613	5.25E-04	680	1.47E-04	747	1.85E-05
413	1.37E-05	480	2.23E-04	547	5.48E-04	614	5.21E-04	681	1.43E-04	748	1.81E-05
414	1.58E-05	481	2.24E-04	548	5.49E-04	615	5.15E-04	682	1.39E-04	749	1.74E-05
415	1.70E-05	482	2.27E-04	549	5.51E-04	616	5.11E-04	683	1.35E-04	750	1.71E-05
416	1.90E-05	483	2.28E-04	550	5.51E-04	617	5.07E-04	684	1.31E-04	751	1.66E-05
417	2.17E-05	484	2.30E-04	551	5.54E-04	618	5.02E-04	685	1.27E-04	752	1.60E-05
418	2.43E-05	485	2.37E-04	552	5.54E-04	619	4.97E-04	686	1.24E-04	753	1.55E-05
419	2.73E-05	486	2.38E-04	553	5.57E-04	620	4.89E-04	687	1.20E-04	754	1.50E-05
420	3.07E-05	487	2.42E-04	554	5.60E-04	621	4.86E-04	688	1.17E-04	755	1.46E-05
421	3.37E-05	488	2.47E-04	555	5.62E-04	622	4.81E-04	689	1.14E-04	756	1.40E-05
422	3.85E-05	489	2.50E-04	556	5.64E-04	623	4.75E-04	690	1.11E-04	757	1.36E-05
423	4.37E-05	490	2.59E-04	557	5.65E-04	624	4.68E-04	691	1.08E-04	758	1.33E-05
424	4.88E-05	491	2.64E-04	558	5.68E-04	625	4.63E-04	692	1.04E-04	759	1.28E-05
425	5.36E-05	492	2.74E-04	559	5.69E-04	626	4.59E-04	693	1.01E-04	760	1.23E-05
426	6.15E-05	493	2.82E-04	560	5.71E-04	627	4.53E-04	694	9.83E-05	761	1.21E-05
427	7.01E-05	494	2.93E-04	561	5.71E-04	628	4.47E-04	695	9.51E-05	762	1.15E-05
428	7.91E-05	495	3.04E-04	562	5.73E-04	629	4.41E-04	696	9.21E-05	763	1.13E-05
429	8.78E-05	496	3.16E-04	563	5.75E-04	630	4.35E-04	697	8.99E-05	764	1.08E-05
430	9.93E-05	497	3.23E-04	564	5.75E-04	631	4.28E-04	698	8.68E-05	765	1.06E-05
431	1.10E-04	498	3.36E-04	565	5.76E-04	632	4.22E-04	699	8.48E-05	766	1.02E-05
432	1.23E-04	499	3.47E-04	566	5.79E-04	633	4.16E-04	700	8.18E-05	767	9.90E-06
433	1.38E-04	500	3.55E-04	567	5.79E-04	634	4.10E-04	701	7.97E-05	768	9.70E-06
434	1.55E-04	501	3.66E-04	568	5.80E-04	635	4.03E-04	702	7.70E-05	769	9.30E-06
435	1.71E-04	502	3.76E-04	569	5.83E-04	636	3.96E-04	703	7.48E-05	770	9.00E-06
436	1.92E-04	503	3.83E-04	570	5.84E-04	637	3.89E-04	704	7.22E-05	771	8.80E-06
437	2.17E-04	504	3.95E-04	571	5.83E-04	638	3.84E-04	705	7.04E-05	772	8.60E-06
438	2.43E-04	505	4.03E-04	572	5.83E-04	639	3.77E-04	706	6.82E-05	773	8.10E-06
439	2.73E-04	506	4.12E-04	573	5.85E-04	640	3.70E-04	707	6.65E-05	774	8.10E-06
440	3.08E-04	507	4.21E-04	574	5.84E-04	641	3.61E-04	708	6.41E-05	775	7.90E-06
441	3.54E-04	508	4.27E-04	575	5.84E-04	642	3.56E-04	709	6.20E-05	776	7.50E-06
442	4.04E-04	509	4.35E-04	576	5.85E-04	643	3.50E-04	710	6.02E-05	777	7.40E-06
443	4.70E-04	510	4.40E-04	577	5.85E-04	644	3.44E-04	711	5.82E-05	778	7.10E-06
444	5.36E-04	511	4.49E-04	578	5.85E-04	645	3.37E-04	712	5.72E-05	779	7.10E-06
445	6.12E-04	512	4.53E-04	579	5.87E-04	646	3.31E-04	713	5.48E-05	780	7.10E-06
446	6.93E-04	513	4.59E-04	580	5.87E-04	647	3.23E-04	714	5.34E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	C-SWISH2X4@20W5000K	<b>Sample ID</b>	240119002-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	24.9	<b>Humidity (%RH)</b>	43.8

Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at <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	0.081	20.1	0.899
<b>NON-WORST CASE</b>	120.0	60	0.164	19.5	0.991

#### 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°)
2828	160.6	169.8	110.0	131.3	140.7	74.1%

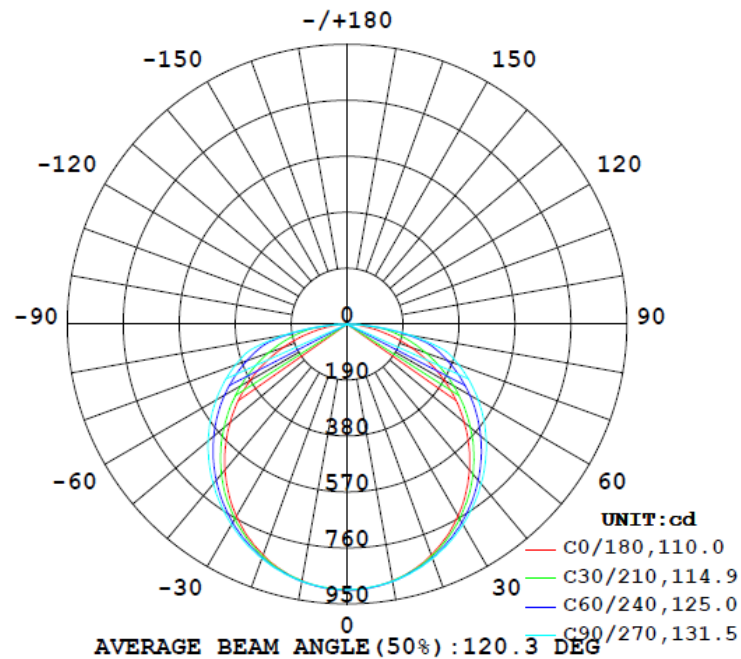
UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
16.8	19.9	1.26	1.30



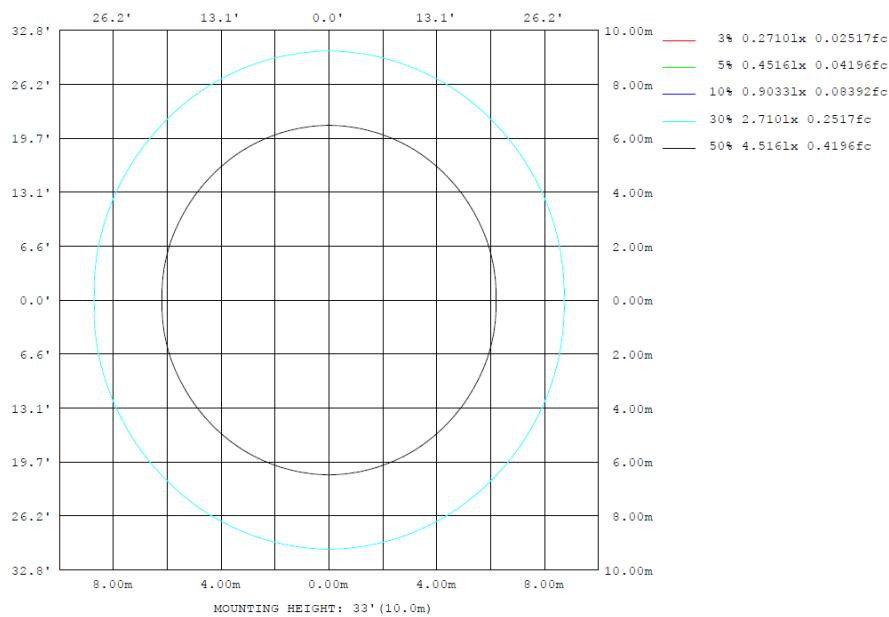
## 4.2 Goniophotometer Test

### 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	884.4	885.9	886.3	885.9	884.4	885.9	886.3	885.9	0~ 10	85.32	85.32	3.02,3.02
20	834.0	840.7	846.2	840.7	834.0	840.7	846.2	840.7	10~ 20	244.8	330.1	11.7,11.7
30	752.4	770.3	786.1	770.3	752.4	770.3	786.1	770.3	20~ 30	372.8	702.9	24.9,24.9
40	645.7	676.5	707.0	676.5	645.7	676.5	707.0	676.5	30~ 40	454.6	1157	40.9,40.9
50	519.2	568.0	616.7	568.0	519.2	568.0	616.7	568.0	40~ 50	482.5	1640	58,58
60	380.2	449.0	514.4	449.0	380.2	449.0	514.4	449.0	50~ 60	455.9	2096	74.1,74.1
70	230.6	325.6	403.1	325.6	230.6	325.6	403.1	325.6	60~ 70	381.4	2477	87.6,87.6
80	87.28	192.6	219.7	192.6	87.28	192.6	219.7	192.6	70~ 80	267.4	2745	97.1,97.1
90	0	0	0	0	0	0	0	0	80~ 90	83.12	2828	100,100
100	0	0	0	0	0	0	0	0	90~100	0	2828	100,100
110	0	0	0	0	0	0	0	0	100~110	0	2828	100,100
120	0	0	0	0	0	0	0	0	110~120	0	2828	100,100
130	0	0	0	0	0	0	0	0	120~130	0	2828	100,100
140	0	0	0	0	0	0	0	0	130~140	0	2828	100,100
150	0	0	0	0	0	0	0	0	140~150	0	2828	100,100
160	0	0	0	0	0	0	0	0	150~160	0	2828	100,100
170	0	0	0	0	0	0	0	0	160~170	0	2828	100,100
180	0	0	0	0	0	0	0	0	170~180	0	2828	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	85.32	0-10	85.32	3.02%
10-20	244.79	0-20	330.11	11.67%
20-30	372.79	0-30	702.90	24.86%
30-40	454.59	0-40	1157.49	40.93%
40-50	482.46	0-50	1639.95	57.99%
50-60	455.90	0-60	2095.85	74.12%
60-70	381.42	0-70	2477.27	87.61%
70-80	267.37	0-80	2744.64	97.06%
80-90	83.12	0-90	2827.76	100.00%
90-100	0.00	0-100	2827.76	100.00%
100-110	0.00	0-110	2827.76	100.00%
110-120	0.00	0-120	2827.76	100.00%
120-130	0.00	0-130	2827.76	100.00%
130-140	0.00	0-140	2827.76	100.00%
140-150	0.00	0-150	2827.76	100.00%
150-160	0.00	0-160	2827.76	100.00%
160-170	0.00	0-170	2827.76	100.00%
170-180	0.00	0-180	2827.76	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											
X=2H	Y=2H	8.6	10.3	9.0	10.6	10.9	10.0	11.7	10.3	12.0	12.3
	3H	10.4	11.9	10.8	12.2	12.6	12.5	14.1	12.9	14.4	14.8
	4H	11.0	12.5	11.4	12.8	13.2	13.8	15.2	14.2	15.6	16.0
	6H	11.5	12.8	11.9	13.2	13.6	14.7	16.1	15.1	16.4	16.8
	8H	11.6	12.9	12.0	13.3	13.7	15.0	16.3	15.5	16.7	17.1
	12H	11.7	12.9	12.1	13.3	13.7	15.2	16.5	15.7	16.8	17.3
UGR Viewed Crosswise											
4H	2H	9.5	11.0	9.9	11.4	11.7	10.6	12.0	11.0	12.4	12.8
	3H	11.6	12.8	12.0	13.2	13.6	13.4	14.7	13.8	15.1	15.5
	4H	12.4	13.5	12.8	13.9	14.4	14.8	16.0	15.3	16.4	16.8
	6H	13.0	14.0	13.5	14.4	14.9	16.0	17.0	16.4	17.4	17.9
	8H	13.2	14.1	13.6	14.5	15.0	16.3	17.3	16.8	17.7	18.2
	12H	13.3	14.1	13.8	14.6	15.1	16.6	17.4	17.1	17.9	18.4
UGR Viewed Endwise											
8H	4H	13.2	14.1	13.6	14.5	15.0	15.2	16.1	15.7	16.6	17.0
	6H	14.0	14.8	14.5	15.3	15.7	16.5	17.3	17.0	17.8	18.2
	8H	14.3	15.0	14.8	15.5	16.0	17.0	17.7	17.5	18.2	18.7
	12H	14.5	15.1	15.0	15.6	16.2	17.3	17.9	17.8	18.4	19.0
12H	4H	13.3	14.2	13.8	14.6	15.1	15.2	16.1	15.7	16.6	17.0
	6H	14.2	15.0	14.8	15.4	15.9	16.6	17.3	17.1	17.8	18.3
	8H	14.6	15.3	15.1	15.7	16.3	17.1	17.7	17.6	18.2	18.8

Maximum UGR = 19.0

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											
X=2H	Y=2H	12.2	13.9	12.6	14.2	14.5	13.6	15.3	13.9	15.6	15.9
	3H	14.0	15.5	14.4	15.8	16.2	16.1	17.7	16.5	18.0	18.4
	4H	14.6	16.1	15.0	16.4	16.8	17.4	18.8	17.8	19.2	19.6
	6H	15.1	16.4	15.5	16.8	17.2	18.3	19.7	18.7	20.0	20.4
	8H	15.2	16.5	15.6	16.9	17.3	18.6	19.9	19.1	20.3	20.7
	12H	15.3	16.5	15.7	16.9	17.3	18.8	20.1	19.3	20.4	20.9
UGR Viewed Crosswise											
4H	2H	13.1	14.6	13.5	15.0	15.3	14.2	15.6	14.6	16.0	16.4
	3H	15.2	16.4	15.6	16.8	17.2	17.0	18.3	17.4	18.7	19.1
	4H	16.0	17.1	16.4	17.5	18.0	18.4	19.6	18.9	20.0	20.4
	6H	16.6	17.6	17.1	18.0	18.5	19.6	20.6	20.0	21.0	21.5
	8H	16.8	17.7	17.2	18.1	18.6	19.9	20.9	20.4	21.3	21.8
	12H	16.9	17.7	17.4	18.2	18.7	20.2	21.0	20.7	21.5	22.0
UGR Viewed Endwise											
8H	4H	16.8	17.7	17.2	18.1	18.6	18.8	19.7	19.3	20.2	20.6
	6H	17.6	18.4	18.1	18.9	19.3	20.1	20.9	20.6	21.4	21.8
	8H	17.9	18.6	18.4	19.1	19.6	20.6	21.3	21.1	21.8	22.3
	12H	18.1	18.7	18.6	19.2	19.8	20.9	21.5	21.4	22.0	22.6
12H	4H	16.9	17.8	17.4	18.2	18.7	18.8	19.7	19.3	20.2	20.6
	6H	17.8	18.6	18.4	19.0	19.5	20.2	20.9	20.7	21.4	21.9
	8H	18.2	18.9	18.7	19.3	19.9	20.7	21.3	21.2	21.8	22.4

Maximum UGR = 22.6

## 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	903	903	901	902	903	902	902	902	903	902	901	903	903	903	901	902	903	902	902
5	898	899	897	897	899	897	897	899	897	897	899	898	899	897	897	899	897	897	897
10	884	885	885	886	887	886	886	886	887	886	885	885	884	885	885	886	887	886	886
15	864	866	865	868	868	869	869	869	868	868	865	866	864	866	865	868	868	869	869
20	834	838	838	841	844	845	846	845	844	841	838	838	834	838	838	841	844	845	846
25	797	802	804	809	813	817	819	817	813	809	804	802	797	802	804	809	813	817	819
30	752	760	763	770	778	783	786	783	778	770	763	760	752	760	763	770	778	783	786
35	702	709	717	726	737	744	748	744	737	726	717	709	702	709	717	726	737	744	748
40	646	655	665	676	692	702	707	702	692	676	665	655	646	655	665	676	692	702	707
45	585	595	607	624	644	657	664	657	644	624	607	595	585	595	607	624	644	657	664
50	519	531	546	568	591	608	617	608	591	568	546	531	519	531	546	568	591	608	617
55	451	464	483	510	537	557	567	557	537	510	483	464	451	464	483	510	537	557	567
60	380	393	417	449	480	504	514	504	480	449	417	393	380	393	417	449	480	504	514
65	306	321	351	387	422	448	460	448	422	387	351	321	306	321	351	387	422	448	460
70	231	248	285	326	363	391	403	391	363	326	285	248	231	248	285	326	363	391	403
75	157	178	220	264	304	332	341	332	304	264	220	178	157	178	220	264	304	332	341
80	87.3	113	158	193	206	215	220	215	206	193	158	113	87.3	113	158	193	206	215	220
85	31.1	55.6	76.2	81.6	84.2	85.9	87.5	85.9	84.2	81.6	76.2	55.6	31.1	55.6	76.2	81.6	84.2	85.9	87.5
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	902	903	902	901	903														
5	897	899	897	897	899														
10	886	887	886	885	885														
15	869	868	868	865	866														
20	845	844	841	838	838														
25	817	813	809	804	802														
30	783	778	770	763	760														
35	744	737	726	717	709														
40	702	692	676	665	655														
45	657	644	624	607	595														
50	608	591	568	546	531														
55	557	537	510	483	464														
60	504	480	449	417	393														
65	448	422	387	351	321														
70	391	363	326	285	248														
75	332	304	264	220	178														
80	215	206	193	158	113														
85	85.9	84.2	81.6	76.2	55.6														
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-SWISH2X4@20W5000K	<b>Sample ID</b>	240119002-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	0.164	19.5	0.991	11.22
277.0	60	0.081	20.1	0.899	14.16

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