

## 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

1x4 Luminaires for Ambient Lighting of Interior Commercial Spaces				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	IES LM-79-2008	1500		2714
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		20.1
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	11.56
			277V	14.58
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.992
			277V	0.961
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	4922
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		84.2
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		18
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%		78.1%
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		0.076
(Goniophotometer – Section 4.2)		Non-Worst Case		0.165
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		20.1
(Goniophotometer – Section 4.2)		Non-Worst Case		19.7

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-01-26	C-SWISH1X4@20W5000K	240119003-S1
2	Goniophotometer Test	2024-01-26	C-SWISH1X4@20W5000K	240119003-S1
3	THD and PF Test	2024-01-26	C-SWISH1X4@20W5000K	240119003-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-SWISH1X4@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-SWISH1X4@20W5000K	<b>Sample ID</b>	240119003-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

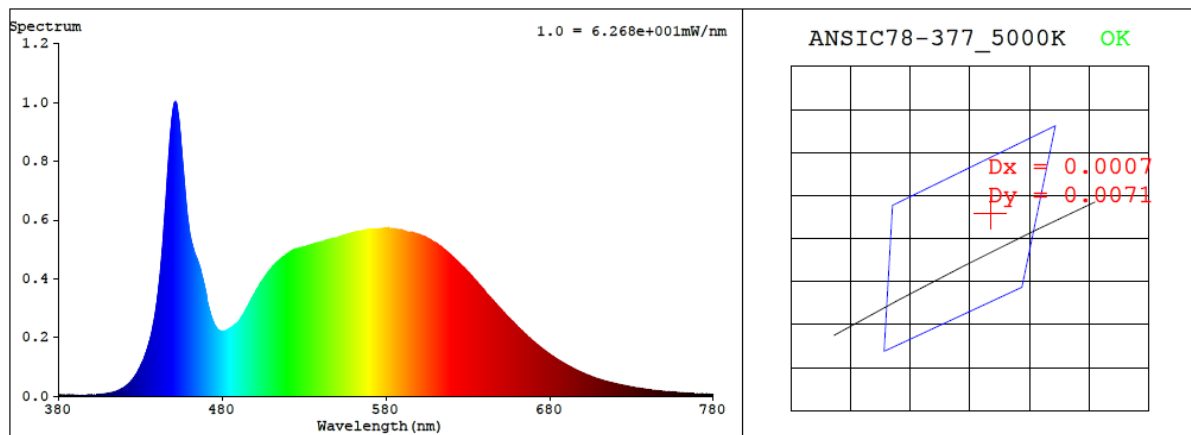
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at <math>25\pm1^{\circ}\text{C}</math>.</p> <p>The sample 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 <math>\pm 0.2</math> percent under load.</p> <p>The sample was measured using <math>4\pi</math> 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	0.165	19.7	0.992
277.0	60	0.076	20.1	0.961

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4922	84.2	18	0.0033	85	96	-11%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3480$   $y = 0.3606$  /  $u' = 0.2099$   $v' = 0.4894$  ( $duv=3.29e-03$ )

CCT= 4922K Prcp WL: Ld=570.8nm Purity=12.6%

Peak WL: Lp=451nm FWHM: =19.0nm Ratio:R=16.0% G=79.6% B=4.4%

Render Index: Ra = 84.2 AvgR = 77.3 TM30:Rf=85 Rg=96

EEL: 0.11883 A+

R1 =82 R2 =89 R3 =93 R4 =83 R5 =82 R6 =84 R7 =89  
R8 =71 R9 =18 R10=73 R11=82 R12=56 R13=84 R14=96 R15=77

## 4.1 Integrating Sphere Test

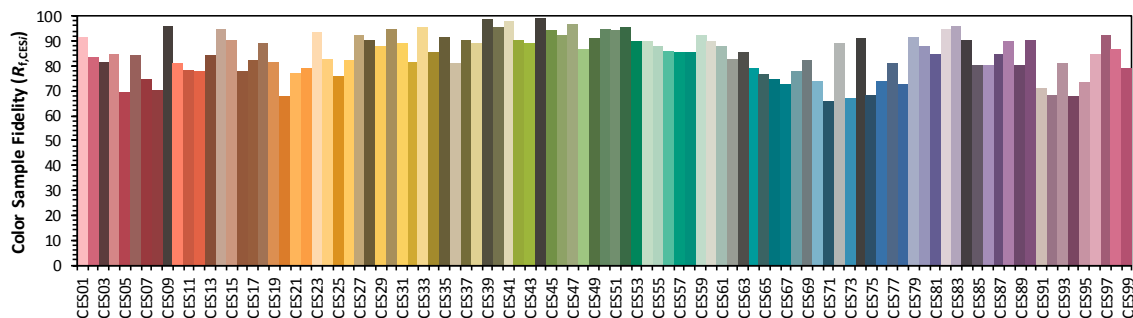
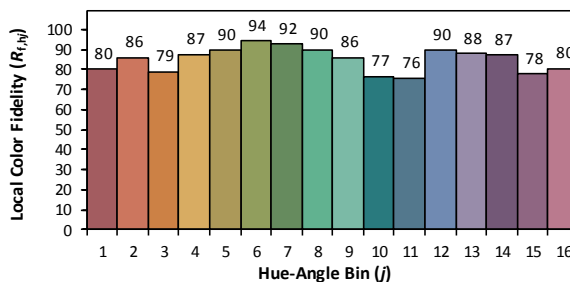
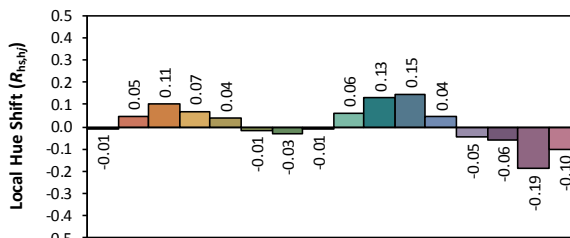
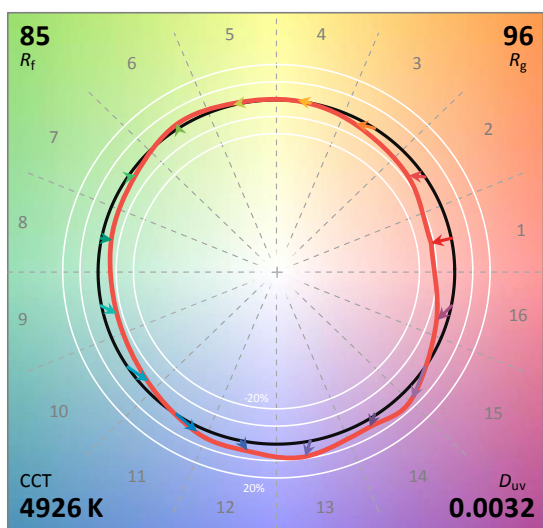
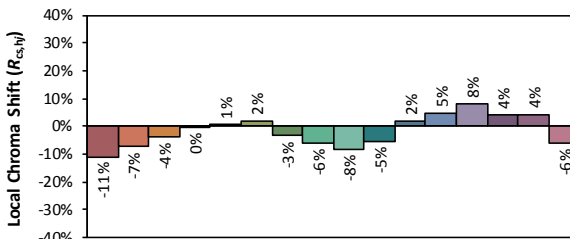
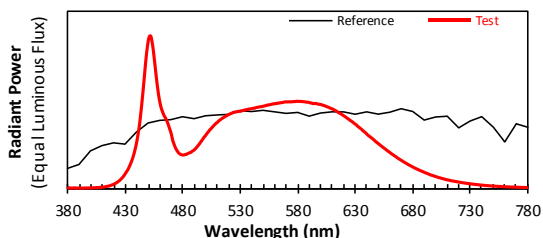
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/1/29

Model: C-SWISH1X4@20W5000K



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

$x$  0.3480  
 $y$  0.3604  
 $u'$  0.2100  
 $v'$  0.4893

CIE 13.3-1995  
(CRI)

$R_a$  84  
 $R_g$  18

## 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	4.30E-06	447	7.86E-04	514	4.59E-04	581	5.71E-04	648	3.09E-04	715	4.99E-05
381	4.90E-06	448	8.65E-04	515	4.64E-04	582	5.71E-04	649	3.03E-04	716	4.87E-05
382	3.60E-06	449	9.28E-04	516	4.68E-04	583	5.70E-04	650	2.97E-04	717	4.72E-05
383	3.50E-06	450	9.77E-04	517	4.73E-04	584	5.70E-04	651	2.91E-04	718	4.59E-05
384	3.40E-06	451	9.99E-04	518	4.76E-04	585	5.69E-04	652	2.85E-04	719	4.46E-05
385	4.50E-06	452	9.98E-04	519	4.82E-04	586	5.68E-04	653	2.79E-04	720	4.31E-05
386	4.50E-06	453	9.64E-04	520	4.85E-04	587	5.67E-04	654	2.73E-04	721	4.22E-05
387	3.40E-06	454	9.16E-04	521	4.89E-04	588	5.66E-04	655	2.67E-04	722	4.06E-05
388	3.40E-06	455	8.51E-04	522	4.92E-04	589	5.66E-04	656	2.61E-04	723	3.91E-05
389	3.40E-06	456	7.84E-04	523	4.95E-04	590	5.64E-04	657	2.55E-04	724	3.82E-05
390	3.30E-06	457	7.17E-04	524	5.00E-04	591	5.61E-04	658	2.50E-04	725	3.70E-05
391	3.50E-06	458	6.56E-04	525	5.01E-04	592	5.61E-04	659	2.44E-04	726	3.59E-05
392	3.30E-06	459	6.03E-04	526	5.02E-04	593	5.58E-04	660	2.39E-04	727	3.47E-05
393	3.30E-06	460	5.62E-04	527	5.04E-04	594	5.57E-04	661	2.33E-04	728	3.37E-05
394	3.50E-06	461	5.30E-04	528	5.04E-04	595	5.57E-04	662	2.27E-04	729	3.27E-05
395	3.70E-06	462	5.08E-04	529	5.07E-04	596	5.58E-04	663	2.23E-04	730	3.17E-05
396	4.00E-06	463	4.87E-04	530	5.06E-04	597	5.55E-04	664	2.17E-04	731	3.08E-05
397	3.90E-06	464	4.72E-04	531	5.09E-04	598	5.53E-04	665	2.12E-04	732	2.96E-05
398	4.10E-06	465	4.59E-04	532	5.11E-04	599	5.52E-04	666	2.07E-04	733	2.88E-05
399	4.20E-06	466	4.42E-04	533	5.12E-04	600	5.51E-04	667	2.01E-04	734	2.80E-05
400	4.30E-06	467	4.24E-04	534	5.15E-04	601	5.49E-04	668	1.96E-04	735	2.69E-05
401	4.70E-06	468	4.01E-04	535	5.16E-04	602	5.46E-04	669	1.91E-04	736	2.62E-05
402	5.50E-06	469	3.78E-04	536	5.18E-04	603	5.44E-04	670	1.87E-04	737	2.53E-05
403	5.40E-06	470	3.54E-04	537	5.20E-04	604	5.41E-04	671	1.82E-04	738	2.47E-05
404	5.80E-06	471	3.18E-04	538	5.22E-04	605	5.38E-04	672	1.77E-04	739	2.35E-05
405	6.20E-06	472	2.96E-04	539	5.22E-04	606	5.35E-04	673	1.73E-04	740	2.30E-05
406	6.90E-06	473	2.75E-04	540	5.24E-04	607	5.33E-04	674	1.68E-04	741	2.21E-05
407	7.10E-06	474	2.60E-04	541	5.26E-04	608	5.28E-04	675	1.64E-04	742	2.16E-05
408	8.10E-06	475	2.47E-04	542	5.26E-04	609	5.25E-04	676	1.60E-04	743	2.07E-05
409	8.50E-06	476	2.36E-04	543	5.28E-04	610	5.22E-04	677	1.55E-04	744	2.01E-05
410	9.50E-06	477	2.28E-04	544	5.31E-04	611	5.20E-04	678	1.51E-04	745	1.94E-05
411	1.04E-05	478	2.24E-04	545	5.32E-04	612	5.15E-04	679	1.47E-04	746	1.90E-05
412	1.17E-05	479	2.21E-04	546	5.34E-04	613	5.11E-04	680	1.43E-04	747	1.84E-05
413	1.29E-05	480	2.20E-04	547	5.36E-04	614	5.07E-04	681	1.39E-04	748	1.78E-05
414	1.47E-05	481	2.21E-04	548	5.36E-04	615	5.01E-04	682	1.35E-04	749	1.73E-05
415	1.60E-05	482	2.23E-04	549	5.38E-04	616	4.97E-04	683	1.32E-04	750	1.68E-05
416	1.81E-05	483	2.24E-04	550	5.39E-04	617	4.92E-04	684	1.28E-04	751	1.62E-05
417	2.05E-05	484	2.28E-04	551	5.41E-04	618	4.88E-04	685	1.25E-04	752	1.58E-05
418	2.34E-05	485	2.32E-04	552	5.43E-04	619	4.83E-04	686	1.21E-04	753	1.53E-05
419	2.60E-05	486	2.35E-04	553	5.45E-04	620	4.78E-04	687	1.18E-04	754	1.46E-05
420	2.96E-05	487	2.38E-04	554	5.47E-04	621	4.73E-04	688	1.14E-04	755	1.43E-05
421	3.35E-05	488	2.44E-04	555	5.49E-04	622	4.68E-04	689	1.11E-04	756	1.39E-05
422	3.79E-05	489	2.49E-04	556	5.50E-04	623	4.62E-04	690	1.08E-04	757	1.34E-05
423	4.25E-05	490	2.54E-04	557	5.52E-04	624	4.57E-04	691	1.05E-04	758	1.29E-05
424	4.83E-05	491	2.62E-04	558	5.53E-04	625	4.52E-04	692	1.02E-04	759	1.24E-05
425	5.45E-05	492	2.71E-04	559	5.55E-04	626	4.46E-04	693	9.90E-05	760	1.22E-05
426	6.22E-05	493	2.79E-04	560	5.55E-04	627	4.41E-04	694	9.57E-05	761	1.19E-05
427	7.00E-05	494	2.89E-04	561	5.58E-04	628	4.36E-04	695	9.26E-05	762	1.15E-05
428	7.89E-05	495	2.99E-04	562	5.58E-04	629	4.29E-04	696	8.93E-05	763	1.12E-05
429	8.94E-05	496	3.10E-04	563	5.60E-04	630	4.23E-04	697	8.69E-05	764	1.10E-05
430	1.01E-04	497	3.20E-04	564	5.60E-04	631	4.19E-04	698	8.50E-05	765	1.04E-05
431	1.13E-04	498	3.32E-04	565	5.62E-04	632	4.11E-04	699	8.21E-05	766	1.01E-05
432	1.24E-04	499	3.41E-04	566	5.63E-04	633	4.04E-04	700	7.95E-05	767	9.90E-06
433	1.39E-04	500	3.50E-04	567	5.64E-04	634	3.99E-04	701	7.74E-05	768	9.50E-06
434	1.56E-04	501	3.62E-04	568	5.66E-04	635	3.92E-04	702	7.46E-05	769	9.20E-06
435	1.75E-04	502	3.70E-04	569	5.68E-04	636	3.87E-04	703	7.19E-05	770	9.10E-06
436	1.95E-04	503	3.80E-04	570	5.68E-04	637	3.79E-04	704	7.06E-05	771	8.80E-06
437	2.19E-04	504	3.89E-04	571	5.67E-04	638	3.73E-04	705	6.82E-05	772	8.60E-06
438	2.47E-04	505	3.97E-04	572	5.68E-04	639	3.67E-04	706	6.59E-05	773	8.00E-06
439	2.79E-04	506	4.05E-04	573	5.68E-04	640	3.60E-04	707	6.41E-05	774	8.00E-06
440	3.17E-04	507	4.14E-04	574	5.68E-04	641	3.52E-04	708	6.17E-05	775	7.60E-06
441	3.62E-04	508	4.21E-04	575	5.69E-04	642	3.46E-04	709	6.02E-05	776	7.50E-06
442	4.11E-04	509	4.28E-04	576	5.70E-04	643	3.40E-04	710	5.80E-05	777	7.30E-06
443	4.75E-04	510	4.33E-04	577	5.70E-04	644	3.34E-04	711	5.65E-05	778	7.00E-06
444	5.45E-04	511	4.42E-04	578	5.70E-04	645	3.28E-04	712	5.50E-05	779	7.00E-06
445	6.22E-04	512	4.48E-04	579	5.72E-04	646	3.22E-04	713	5.29E-05	780	7.00E-06
446	7.03E-04	513	4.53E-04	580	5.71E-04	647	3.16E-04	714	5.12E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	C-SWISH1X4@20W5000K	<b>Sample ID</b>	240119003-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	24.8	<b>Humidity (%RH)</b>	42.3

<b>Test Method</b>
<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	0.076	20.1	0.961
<b>NON-WORST CASE</b>	120.0	60	0.165	19.7	0.992

#### 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°)
2714	161.1	163.6	111.1	117.0	135.0	78.1%

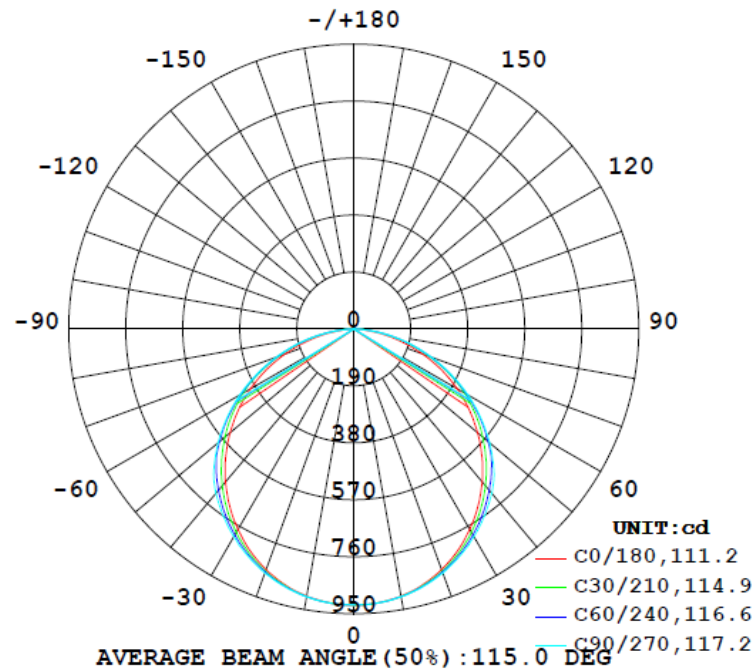
UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
19.4	19.9	1.26	1.30



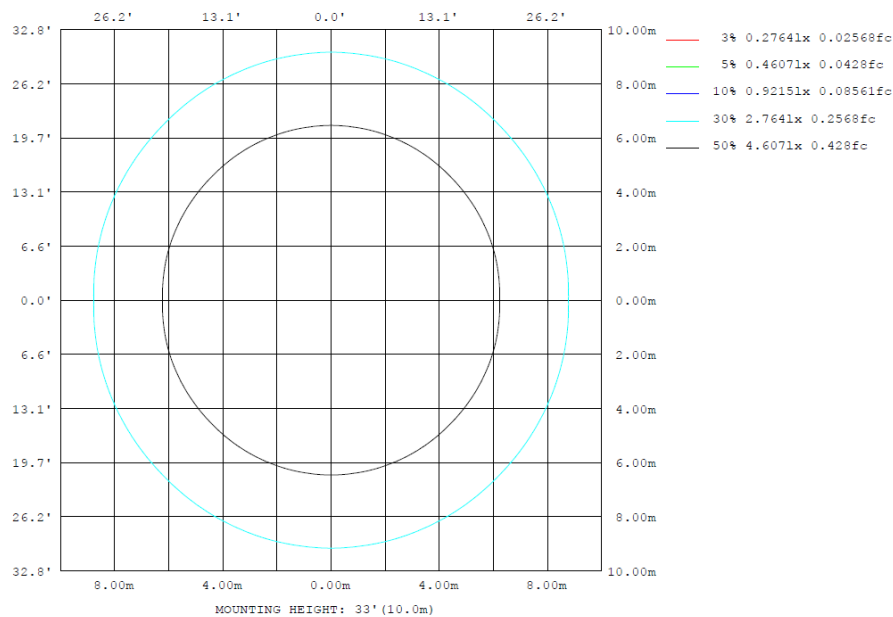
## 4.2 Goniophotometer Test

### 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	zone	total	%lum, lamp
10	904.7	904.6	907.0	904.6	904.7	904.6	907.0	904.6	0- 10	87.20	87.20	3.21,3.21
20	854.4	860.6	866.7	860.6	854.4	860.6	866.7	860.6	10- 20	250.5	337.7	12.4,12.4
30	772.6	787.4	800.2	787.4	772.6	787.4	800.2	787.4	20- 30	381.6	719.4	26.5,26.5
40	665.5	690.7	715.3	690.7	665.5	690.7	715.3	690.7	30- 40	464.7	1184	43.6,43.6
50	538.2	575.1	591.1	575.1	538.2	575.1	591.1	575.1	40- 50	489.5	1674	61.7,61.7
60	397.0	429.7	438.3	429.7	397.0	429.7	438.3	429.7	50- 60	446.6	2120	78.1,78.1
70	243.2	270.5	275.3	270.5	243.2	270.5	275.3	270.5	60- 70	342.9	2463	90.8,90.8
80	92.76	115.1	117.3	115.1	92.76	115.1	117.3	115.1	70- 80	198.8	2662	98.1,98.1
90	0	0	0	0	0	0	0	0	80- 90	52.00	2714	100,100
100	0	0	0	0	0	0	0	0	90-100	0	2714	100,100
110	0	0	0	0	0	0	0	0	100-110	0	2714	100,100
120	0	0	0	0	0	0	0	0	110-120	0	2714	100,100
130	0	0	0	0	0	0	0	0	120-130	0	2714	100,100
140	0	0	0	0	0	0	0	0	130-140	0	2714	100,100
150	0	0	0	0	0	0	0	0	140-150	0	2714	100,100
160	0	0	0	0	0	0	0	0	150-160	0	2714	100,100
170	0	0	0	0	0	0	0	0	160-170	0	2714	100,100
180	0	0	0	0	0	0	0	0	170-180	0	2714	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	87.20	0-10	87.20	3.21%
10-20	250.52	0-20	337.72	12.44%
20-30	381.64	0-30	719.36	26.51%
30-40	464.67	0-40	1184.03	43.63%
40-50	489.49	0-50	1673.52	61.67%
50-60	446.57	0-60	2120.09	78.12%
60-70	342.90	0-70	2462.99	90.76%
70-80	198.81	0-80	2661.80	98.08%
80-90	52.00	0-90	2713.80	100.00%
90-100	0.00	0-100	2713.80	100.00%
100-110	0.00	0-110	2713.80	100.00%
110-120	0.00	0-120	2713.80	100.00%
120-130	0.00	0-130	2713.80	100.00%
130-140	0.00	0-140	2713.80	100.00%
140-150	0.00	0-150	2713.80	100.00%
150-160	0.00	0-160	2713.80	100.00%
160-170	0.00	0-170	2713.80	100.00%
170-180	0.00	0-180	2713.80	100.00%

## 4.2 Goniophotometer Test

UGR – Uncorrected Table:

**UGR TABLE - UNCORRECTED**

Reflectances										
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20
Room Size										
UGR Viewed Crosswise										
UGR Viewed Endwise										
X=2H	Y=2H	11.6	13.2	11.9	13.5	13.9	12.0	13.7	12.4	14.0
	3H	13.4	14.9	13.7	15.2	15.6	13.8	15.3	14.2	15.7
	4H	14.0	15.4	14.4	15.8	16.2	14.5	16.0	14.9	16.3
	6H	14.5	15.8	14.9	16.1	16.5	15.1	16.4	15.5	16.7
	8H	14.6	15.8	15.0	16.2	16.6	15.2	16.5	15.6	16.9
	12H	14.6	15.8	15.1	16.2	16.6	15.3	16.5	15.7	16.9
4H	2H	12.3	13.7	12.7	14.1	14.4	12.6	14.0	13.0	14.4
	3H	14.3	15.5	14.7	15.9	16.3	14.7	15.9	15.1	16.3
	4H	15.1	16.2	15.6	16.6	17.1	15.5	16.6	16.0	17.0
	6H	15.7	16.6	16.2	17.1	17.5	16.2	17.1	16.6	17.6
	8H	15.9	16.8	16.3	17.2	17.7	16.4	17.3	16.8	17.7
	12H	16.0	16.8	16.5	17.2	17.7	16.5	17.3	17.0	17.8
8H	4H	15.5	16.4	16.0	16.8	17.3	15.8	16.7	16.3	17.2
	6H	16.2	16.9	16.7	17.4	17.9	16.6	17.3	17.1	17.8
	8H	16.4	17.1	16.9	17.6	18.1	16.9	17.5	17.4	18.0
	12H	16.6	17.2	17.1	17.7	18.2	17.1	17.7	17.6	18.1
12H	4H	15.5	16.3	16.0	16.8	17.3	15.9	16.7	16.4	17.1
	6H	16.3	16.9	16.8	17.4	17.9	16.7	17.3	17.2	17.8
	8H	16.6	17.2	17.1	17.6	18.2	17.0	17.6	17.5	18.1

Maximum UGR = 18.7

UGR – Corrected Table:

**UGR TABLE - CORRECTED**

Reflectances										
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20
Room Size										
UGR Viewed Crosswise										
UGR Viewed Endwise										
X=2H	Y=2H	15.1	16.7	15.4	17.0	17.4	15.5	17.2	15.9	17.5
	3H	16.9	18.4	17.2	18.7	19.1	17.3	18.8	17.7	19.2
	4H	17.5	18.9	17.9	19.3	19.7	18.0	19.5	18.4	19.8
	6H	18.0	19.3	18.4	19.6	20.0	18.6	19.9	19.0	20.2
	8H	18.1	19.3	18.5	19.7	20.1	18.7	20.0	19.1	20.4
	12H	18.1	19.3	18.6	19.7	20.1	18.8	20.0	19.2	20.4
4H	2H	15.8	17.2	16.2	17.6	17.9	16.1	17.5	16.5	17.9
	3H	17.8	19.0	18.2	19.4	19.8	18.2	19.4	18.6	19.8
	4H	18.6	19.7	19.1	20.1	20.6	19.0	20.1	19.5	20.5
	6H	19.2	20.1	19.7	20.6	21.0	19.7	20.6	20.1	21.1
	8H	19.4	20.3	19.8	20.7	21.2	19.9	20.8	20.3	21.2
	12H	19.5	20.3	20.0	20.7	21.2	20.0	20.8	20.5	21.3
8H	4H	19.0	19.9	19.5	20.3	20.8	19.3	20.2	19.8	20.7
	6H	19.7	20.4	20.2	20.9	21.4	20.1	20.8	20.6	21.3
	8H	19.9	20.6	20.4	21.1	21.6	20.4	21.0	20.9	21.5
	12H	20.1	20.7	20.6	21.2	21.7	20.6	21.2	21.1	21.6
12H	4H	19.0	19.8	19.5	20.3	20.8	19.4	20.2	19.9	20.6
	6H	19.8	20.4	20.3	20.9	21.4	20.2	20.8	20.7	21.3
	8H	20.1	20.7	20.6	21.1	21.7	20.5	21.1	21.0	21.6

Maximum UGR = 22.2

## 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	921	921	921	920	921	921	921	921	921	920	921	921	921	921	921	920	921	921	921
5	917	917	917	916	917	918	918	918	917	916	917	917	917	917	917	916	917	918	918
10	905	907	906	905	906	907	907	907	906	905	906	907	905	907	906	905	906	907	907
15	884	886	887	887	889	889	890	889	889	887	887	886	884	886	887	887	889	889	890
20	854	858	860	861	863	865	867	865	863	861	860	858	854	858	860	861	863	865	867
25	817	822	825	827	832	835	836	835	832	827	825	822	817	822	825	827	832	835	836
30	773	779	784	787	794	799	800	799	794	787	784	779	773	779	784	787	794	799	800
35	722	730	736	742	750	757	760	757	750	742	736	730	722	730	736	742	750	757	760
40	665	675	683	691	702	711	715	711	702	691	683	675	665	675	683	691	702	711	715
45	604	614	624	635	650	658	660	658	650	635	624	614	604	614	624	635	650	658	660
50	538	549	560	575	585	588	591	588	585	575	560	549	538	549	560	575	585	588	591
55	469	480	495	506	511	515	517	515	511	506	495	480	469	480	495	506	511	515	517
60	397	407	425	430	434	437	438	437	434	430	425	407	397	407	425	430	434	437	438
65	321	333	349	351	353	356	357	356	353	351	349	333	321	333	349	351	353	356	357
70	243	258	268	271	272	274	275	274	272	271	268	258	243	258	268	271	272	274	275
75	166	183	189	191	192	194	195	194	192	191	189	183	166	183	189	191	192	194	195
80	92.8	107	113	115	116	117	117	117	116	115	113	107	92.8	107	113	115	116	117	117
85	32.8	42.6	45.6	45.5	44.6	43.7	43.5	43.7	44.6	45.5	45.6	42.6	32.8	42.6	45.6	45.5	44.6	43.7	43.5
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	921	921	920	921	921														
5	918	917	916	917	917														
10	907	906	905	906	907														
15	889	889	887	887	886														
20	865	863	861	860	858														
25	835	832	827	825	822														
30	799	794	787	784	779														
35	757	750	742	736	730														
40	711	702	691	683	675														
45	658	650	635	624	614														
50	588	585	575	560	549														
55	515	511	506	495	480														
60	437	434	430	425	407														
65	356	353	351	349	333														
70	274	272	271	268	258														
75	194	192	191	189	183														
80	117	116	115	113	107														
85	43.7	44.6	45.5	45.6	42.6														
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-SWISH1X4@20W5000K	<b>Sample ID</b>	240119003-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	0.165	19.7	0.992	11.56
277.0	60	0.076	20.1	0.961	14.58

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