

## 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		2704
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	137.3
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.7
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	11.67
			277V	15.26
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.992
			277V	0.959
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4078
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		85.2
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		22
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%		-10%
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		0.074
(Goniophotometer – Section 4.2)		Non-Worst Case		0.161
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.7
(Goniophotometer – Section 4.2)		Non-Worst Case		19.2

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-01-26	C-SWISH1X4@20W4000K	240119003-S1
2	Goniophotometer Test	2024-01-26	C-SWISH1X4@20W4000K	240119003-S1
3	THD and PF Test	2024-01-26	C-SWISH1X4@20W4000K	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@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-SWISH1X4@20W4000K	<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

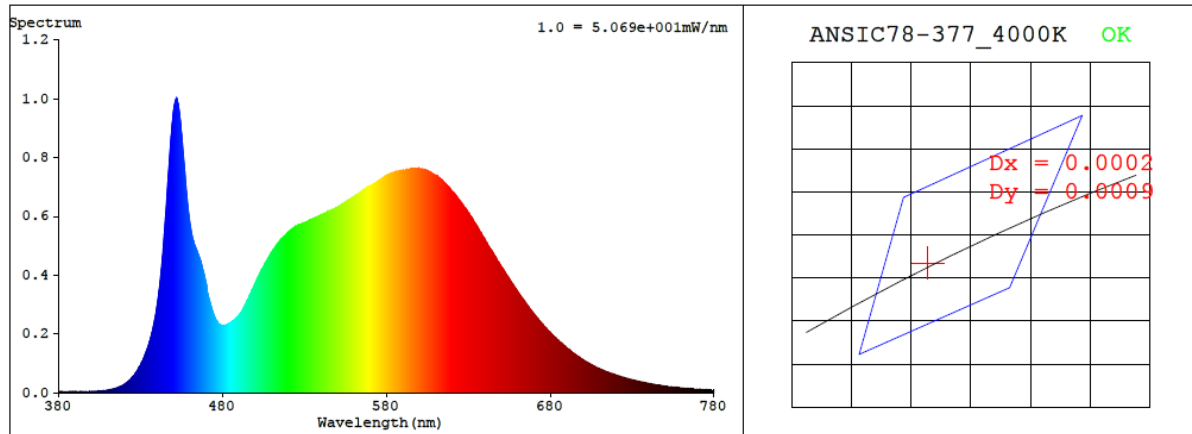
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	19.2	0.992
277.0	60	0.074	19.7	0.959

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4078	85.2	22	0.0004	85	96	-10%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3773$   $y = 0.3756$  /  $u' = 0.2235$   $v' = 0.5006$  ( $duv=3.59e-04$ )

CCT= 4078K Prcp WL:  $L_d=578.6nm$  Purity=25.9%

Peak WL:  $L_p=452nm$  FWHM:  $=19.2nm$  Ratio:  $R=18.4\%$   $G=77.9\%$   $B=3.7\%$

Render Index:  $R_a = 85.2$   $AvgR = 79.1$   $TM30:R_f=85$   $R_g=96$

EEL: 0.11709 A+

R1 =84	R2 =91	R3 =95	R4 =84	R5 =84	R6 =86	R7 =88
R8 =70	R9 =22	R10=77	R11=84	R12=61	R13=86	R14=97 R15=79

## 4.1 Integrating Sphere Test

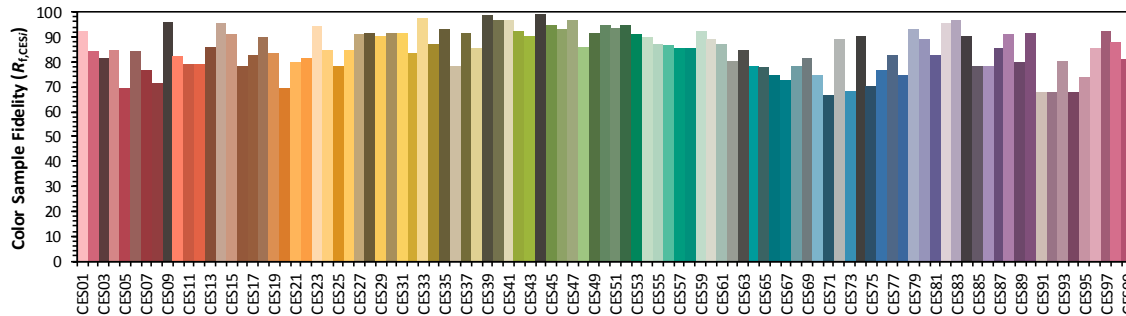
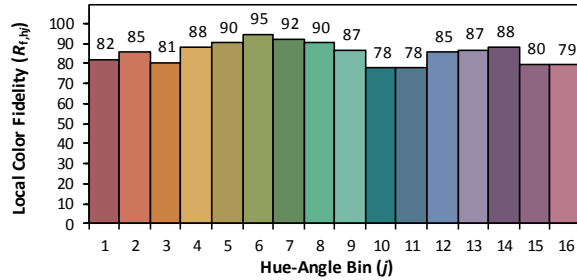
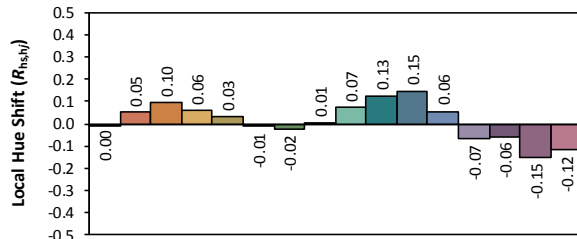
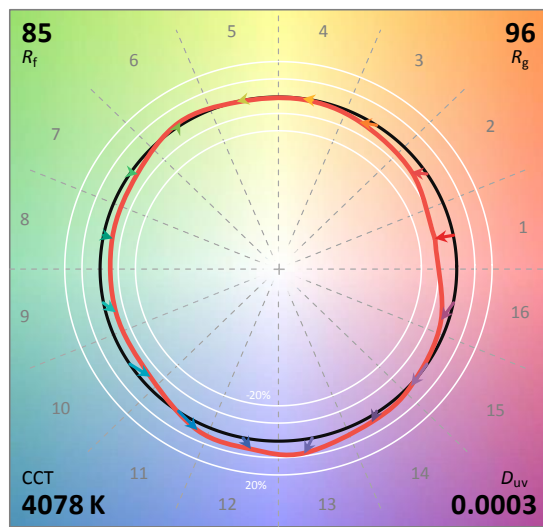
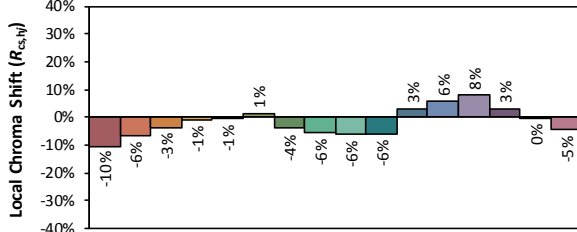
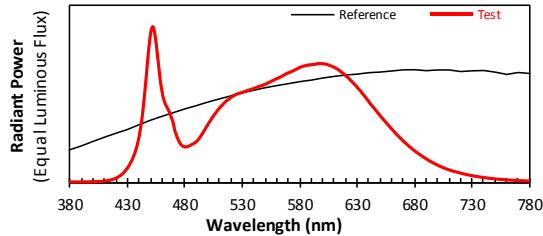
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/1/29

Model: C-SWISH1X4@20W4000K



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

$x$  0.3773  
 $y$  0.3754  
 $u'$  0.2236  
 $v'$  0.5005

CIE 13.3-1995  
(CRI)

$R_a$  85  
 $R_g$  22

## 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	5.10E-06	447	7.42E-04	514	5.09E-04	581	7.40E-04	648	4.48E-04	715	7.00E-05
381	3.00E-06	448	8.22E-04	515	5.15E-04	582	7.42E-04	649	4.40E-04	716	6.81E-05
382	4.20E-06	449	8.95E-04	516	5.23E-04	583	7.46E-04	650	4.30E-04	717	6.62E-05
383	2.40E-06	450	9.53E-04	517	5.28E-04	584	7.48E-04	651	4.21E-04	718	6.43E-05
384	3.40E-06	451	9.87E-04	518	5.33E-04	585	7.49E-04	652	4.13E-04	719	6.24E-05
385	2.80E-06	452	1.00E-03	519	5.39E-04	586	7.52E-04	653	4.04E-04	720	6.03E-05
386	2.90E-06	453	9.80E-04	520	5.45E-04	587	7.52E-04	654	3.96E-04	721	5.88E-05
387	2.90E-06	454	9.42E-04	521	5.49E-04	588	7.54E-04	655	3.88E-04	722	5.65E-05
388	3.30E-06	455	8.84E-04	522	5.54E-04	589	7.55E-04	656	3.78E-04	723	5.47E-05
389	3.00E-06	456	8.20E-04	523	5.58E-04	590	7.55E-04	657	3.70E-04	724	5.34E-05
390	3.20E-06	457	7.53E-04	524	5.63E-04	591	7.55E-04	658	3.61E-04	725	5.18E-05
391	3.70E-06	458	6.88E-04	525	5.66E-04	592	7.58E-04	659	3.53E-04	726	4.97E-05
392	3.20E-06	459	6.29E-04	526	5.69E-04	593	7.57E-04	660	3.45E-04	727	4.85E-05
393	4.00E-06	460	5.86E-04	527	5.72E-04	594	7.59E-04	661	3.37E-04	728	4.67E-05
394	3.00E-06	461	5.46E-04	528	5.73E-04	595	7.62E-04	662	3.29E-04	729	4.51E-05
395	3.20E-06	462	5.22E-04	529	5.76E-04	596	7.63E-04	663	3.21E-04	730	4.40E-05
396	4.00E-06	463	5.01E-04	530	5.77E-04	597	7.62E-04	664	3.13E-04	731	4.26E-05
397	4.40E-06	464	4.87E-04	531	5.80E-04	598	7.62E-04	665	3.05E-04	732	4.14E-05
398	3.70E-06	465	4.73E-04	532	5.83E-04	599	7.63E-04	666	2.98E-04	733	4.00E-05
399	5.30E-06	466	4.58E-04	533	5.86E-04	600	7.62E-04	667	2.91E-04	734	3.85E-05
400	4.30E-06	467	4.42E-04	534	5.89E-04	601	7.61E-04	668	2.82E-04	735	3.76E-05
401	4.60E-06	468	4.19E-04	535	5.91E-04	602	7.61E-04	669	2.76E-04	736	3.64E-05
402	5.10E-06	469	3.99E-04	536	5.93E-04	603	7.59E-04	670	2.68E-04	737	3.50E-05
403	5.00E-06	470	3.75E-04	537	5.96E-04	604	7.57E-04	671	2.61E-04	738	3.39E-05
404	5.80E-06	471	3.37E-04	538	5.97E-04	605	7.54E-04	672	2.55E-04	739	3.30E-05
405	6.10E-06	472	3.15E-04	539	6.00E-04	606	7.51E-04	673	2.48E-04	740	3.16E-05
406	6.20E-06	473	2.95E-04	540	6.02E-04	607	7.49E-04	674	2.41E-04	741	3.10E-05
407	6.90E-06	474	2.76E-04	541	6.06E-04	608	7.46E-04	675	2.35E-04	742	3.00E-05
408	7.80E-06	475	2.61E-04	542	6.08E-04	609	7.43E-04	676	2.28E-04	743	2.90E-05
409	8.50E-06	476	2.48E-04	543	6.11E-04	610	7.39E-04	677	2.23E-04	744	2.77E-05
410	9.00E-06	477	2.40E-04	544	6.15E-04	611	7.37E-04	678	2.17E-04	745	2.67E-05
411	1.01E-05	478	2.33E-04	545	6.17E-04	612	7.31E-04	679	2.10E-04	746	2.63E-05
412	1.13E-05	479	2.31E-04	546	6.20E-04	613	7.27E-04	680	2.05E-04	747	2.56E-05
413	1.25E-05	480	2.28E-04	547	6.21E-04	614	7.23E-04	681	1.99E-04	748	2.47E-05
414	1.36E-05	481	2.28E-04	548	6.24E-04	615	7.16E-04	682	1.93E-04	749	2.39E-05
415	1.53E-05	482	2.30E-04	549	6.28E-04	616	7.11E-04	683	1.88E-04	750	2.33E-05
416	1.74E-05	483	2.32E-04	550	6.29E-04	617	7.05E-04	684	1.82E-04	751	2.22E-05
417	1.96E-05	484	2.36E-04	551	6.33E-04	618	6.99E-04	685	1.78E-04	752	2.14E-05
418	2.20E-05	485	2.39E-04	552	6.37E-04	619	6.94E-04	686	1.72E-04	753	2.08E-05
419	2.48E-05	486	2.44E-04	553	6.42E-04	620	6.86E-04	687	1.68E-04	754	2.04E-05
420	2.78E-05	487	2.47E-04	554	6.43E-04	621	6.80E-04	688	1.63E-04	755	1.95E-05
421	3.16E-05	488	2.51E-04	555	6.48E-04	622	6.74E-04	689	1.58E-04	756	1.91E-05
422	3.59E-05	489	2.56E-04	556	6.52E-04	623	6.67E-04	690	1.53E-04	757	1.86E-05
423	4.06E-05	490	2.62E-04	557	6.55E-04	624	6.59E-04	691	1.49E-04	758	1.79E-05
424	4.56E-05	491	2.70E-04	558	6.59E-04	625	6.51E-04	692	1.44E-04	759	1.75E-05
425	5.23E-05	492	2.78E-04	559	6.63E-04	626	6.44E-04	693	1.40E-04	760	1.69E-05
426	5.78E-05	493	2.89E-04	560	6.66E-04	627	6.36E-04	694	1.35E-04	761	1.62E-05
427	6.64E-05	494	2.99E-04	561	6.70E-04	628	6.29E-04	695	1.32E-04	762	1.56E-05
428	7.45E-05	495	3.12E-04	562	6.72E-04	629	6.22E-04	696	1.27E-04	763	1.54E-05
429	8.48E-05	496	3.22E-04	563	6.75E-04	630	6.12E-04	697	1.23E-04	764	1.50E-05
430	9.36E-05	497	3.34E-04	564	6.79E-04	631	6.03E-04	698	1.20E-04	765	1.44E-05
431	1.05E-04	498	3.48E-04	565	6.84E-04	632	5.96E-04	699	1.16E-04	766	1.39E-05
432	1.17E-04	499	3.59E-04	566	6.88E-04	633	5.87E-04	700	1.12E-04	767	1.37E-05
433	1.32E-04	500	3.71E-04	567	6.92E-04	634	5.78E-04	701	1.08E-04	768	1.30E-05
434	1.46E-04	501	3.84E-04	568	6.96E-04	635	5.69E-04	702	1.05E-04	769	1.26E-05
435	1.64E-04	502	3.95E-04	569	7.00E-04	636	5.59E-04	703	1.02E-04	770	1.22E-05
436	1.82E-04	503	4.07E-04	570	7.03E-04	637	5.50E-04	704	9.91E-05	771	1.19E-05
437	2.04E-04	504	4.18E-04	571	7.05E-04	638	5.41E-04	705	9.52E-05	772	1.14E-05
438	2.30E-04	505	4.28E-04	572	7.09E-04	639	5.31E-04	706	9.27E-05	773	1.11E-05
439	2.59E-04	506	4.39E-04	573	7.12E-04	640	5.22E-04	707	8.96E-05	774	1.09E-05
440	2.94E-04	507	4.47E-04	574	7.15E-04	641	5.11E-04	708	8.63E-05	775	1.04E-05
441	3.35E-04	508	4.58E-04	575	7.19E-04	642	5.02E-04	709	8.44E-05	776	1.02E-05
442	3.81E-04	509	4.68E-04	576	7.22E-04	643	4.93E-04	710	8.15E-05	777	9.70E-06
443	4.38E-04	510	4.76E-04	577	7.27E-04	644	4.85E-04	711	7.90E-05	778	9.50E-06
444	5.06E-04	511	4.85E-04	578	7.29E-04	645	4.76E-04	712	7.67E-05	779	9.50E-06
445	5.80E-04	512	4.92E-04	579	7.34E-04	646	4.66E-04	713	7.46E-05	780	9.50E-06
446	6.59E-04	513	5.00E-04	580	7.39E-04	647	4.58E-04	714	7.22E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	C-SWISH1X4@20W4000K	<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

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	0.074	19.7	0.959
<b>NON-WORST CASE</b>	120.0	60	0.161	19.2	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°)
2704	161.2	163.6	111.4	117.1	137.3	78.1%

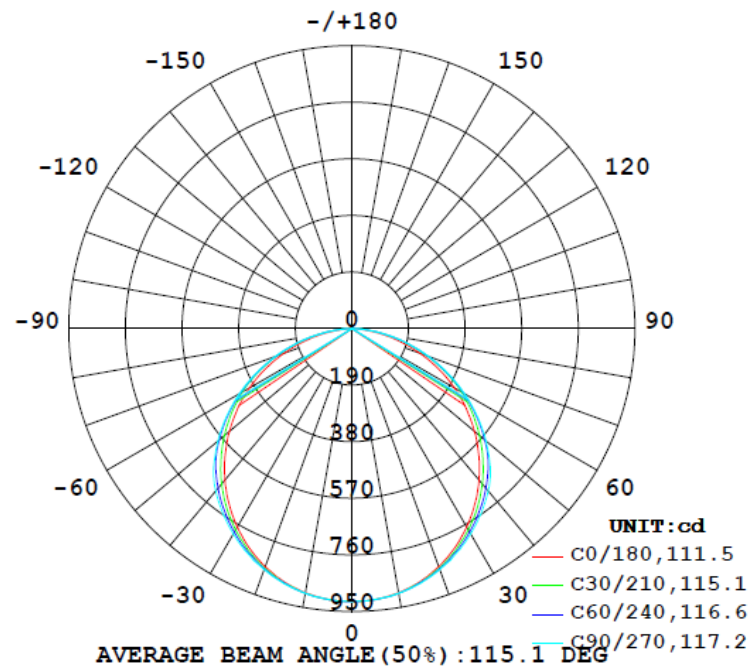
UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
19.4	19.9	1.26	1.30



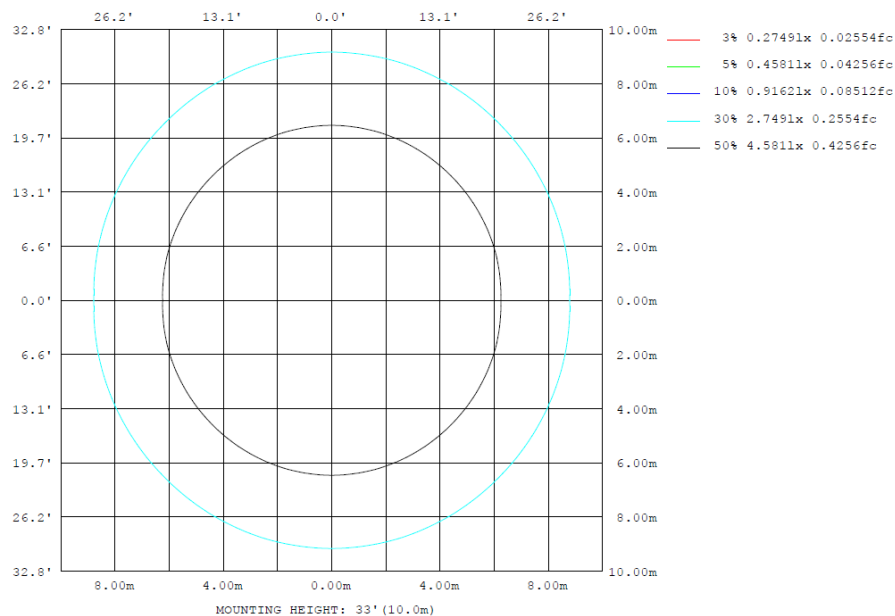
## 4.2 Goniophotometer Test

### 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	Φ zone	Φ total	%lum, lamp
10	900.5	902.2	902.2	902.2	900.5	902.2	902.2	902.2	0- 10	86.79	86.79	3.21, 3.21
20	851.2	857.0	861.2	857.0	851.2	857.0	861.2	857.0	10- 20	249.3	336.1	12.4, 12.4
30	769.5	784.9	796.6	784.9	769.5	784.9	796.6	784.9	20- 30	380.0	716.1	26.5, 26.5
40	663.6	688.2	711.7	688.2	663.6	688.2	711.7	688.2	30- 40	462.8	1179	43.6, 43.6
50	536.8	573.7	587.6	573.7	536.8	573.7	587.6	573.7	40- 50	487.7	1667	61.6, 61.6
60	396.1	428.7	436.2	428.7	396.1	428.7	436.2	428.7	50- 60	445.0	2112	78.1, 78.1
70	243.2	270.2	273.8	270.2	243.2	270.2	273.8	270.2	60- 70	341.9	2454	90.7, 90.7
80	93.06	114.7	116.5	114.7	93.06	114.7	116.5	114.7	70- 80	198.3	2652	98.1, 98.1
90	0	0	0	0	0	0	0	0	80- 90	51.90	2704	100, 100
100	0	0	0	0	0	0	0	0	90-100	0	2704	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	2704	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	2704	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	2704	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	2704	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	2704	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	2704	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	2704	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	2704	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	86.79	0-10	86.79	3.21%
10-20	249.32	0-20	336.11	12.43%
20-30	379.98	0-30	716.09	26.49%
30-40	462.84	0-40	1178.93	43.60%
40-50	487.71	0-50	1666.64	61.64%
50-60	444.98	0-60	2111.62	78.10%
60-70	341.90	0-70	2453.52	90.75%
70-80	198.33	0-80	2651.85	98.08%
80-90	51.90	0-90	2703.75	100.00%
90-100	0.00	0-100	2703.75	100.00%
100-110	0.00	0-110	2703.75	100.00%
110-120	0.00	0-120	2703.75	100.00%
120-130	0.00	0-130	2703.75	100.00%
130-140	0.00	0-140	2703.75	100.00%
140-150	0.00	0-150	2703.75	100.00%
150-160	0.00	0-160	2703.75	100.00%
160-170	0.00	0-170	2703.75	100.00%
170-180	0.00	0-180	2703.75	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										
X=2H	Y=2H	11.6	13.2	12.0	13.6	13.9	12.0	13.6	12.4	14.0
	3H	13.4	14.9	13.8	15.2	15.6	13.8	15.3	14.2	15.7
	4H	14.0	15.5	14.4	15.8	16.2	14.5	15.9	14.9	16.3
	6H	14.5	15.8	14.9	16.2	16.5	15.0	16.4	15.5	16.7
	8H	14.6	15.9	15.0	16.2	16.6	15.2	16.5	15.6	16.8
	12H	14.7	15.9	15.1	16.2	16.7	15.3	16.5	15.7	16.9
UGR Viewed Endwise										
4H	2H	12.3	13.7	12.7	14.1	14.4	12.6	14.0	13.0	14.4
	3H	14.4	15.5	14.8	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	15.9	17.0
	6H	15.7	16.7	16.2	17.1	17.6	16.2	17.1	16.6	17.5
	8H	15.9	16.8	16.4	17.2	17.7	16.4	17.3	16.8	17.7
	12H	16.0	16.8	16.5	17.3	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	17.0	16.7	17.4	17.9	16.6	17.3	17.1	17.8
	8H	16.5	17.1	17.0	17.6	18.1	16.9	17.5	17.4	18.0
	12H	16.6	17.2	17.1	17.7	18.3	17.1	17.7	17.6	18.1
12H	4H	15.6	16.3	16.0	16.8	17.3	15.9	16.7	16.4	17.1
	6H	16.3	17.0	16.8	17.4	18.0	16.7	17.3	17.2	17.8
	8H	16.6	17.2	17.1	17.7	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										
X=2H	Y=2H	15.1	16.7	15.5	17.1	17.4	15.5	17.1	15.9	17.5
	3H	16.9	18.4	17.3	18.7	19.1	17.3	18.8	17.7	19.2
	4H	17.5	19.0	17.9	19.3	19.7	18.0	19.4	18.4	19.8
	6H	18.0	19.3	18.4	19.7	20.0	18.5	19.9	19.0	20.2
	8H	18.1	19.4	18.5	19.7	20.1	18.7	20.0	19.1	20.3
	12H	18.2	19.4	18.6	19.7	20.2	18.8	20.0	19.2	20.4
UGR Viewed Endwise										
4H	2H	15.8	17.2	16.2	17.6	17.9	16.1	17.5	16.5	17.9
	3H	17.9	19.0	18.3	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	19.4	20.5
	6H	19.2	20.2	19.7	20.6	21.1	19.7	20.6	20.1	21.0
	8H	19.4	20.3	19.9	20.7	21.2	19.9	20.8	20.3	21.2
	12H	19.5	20.3	20.0	20.8	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	20.5	20.2	20.9	21.4	20.1	20.8	20.6	21.3
	8H	20.0	20.6	20.5	21.1	21.6	20.4	21.0	20.9	21.5
	12H	20.1	20.7	20.6	21.2	21.8	20.6	21.2	21.1	21.6
12H	4H	19.1	19.8	19.5	20.3	20.8	19.4	20.2	19.9	20.6
	6H	19.8	20.5	20.3	20.9	21.5	20.2	20.8	20.7	21.3
	8H	20.1	20.7	20.6	21.2	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	916	916	916	917	917	916	916	916	917	917	916	916	916	916	917	917	916	916	916
5	913	913	913	913	913	913	912	913	913	913	913	913	913	913	913	913	913	913	912
10	900	902	902	902	902	902	902	902	902	902	902	902	900	902	902	902	902	902	902
15	880	882	884	883	884	885	886	885	884	883	884	882	880	882	884	883	884	885	886
20	851	855	856	857	859	861	861	861	859	857	856	855	851	855	856	857	859	861	861
25	814	819	822	825	827	831	831	831	827	825	822	819	814	819	822	825	827	831	831
30	770	777	781	785	789	795	797	795	789	785	781	777	770	777	781	785	789	795	797
35	719	727	734	739	747	753	756	753	747	739	734	727	719	727	734	739	747	753	756
40	664	673	681	688	699	708	712	708	699	688	681	673	664	673	681	688	699	708	712
45	602	612	622	633	647	654	656	654	647	633	622	612	602	612	622	633	647	654	656
50	537	548	559	574	582	586	588	586	582	574	559	548	537	548	559	574	582	586	588
55	468	479	493	506	509	512	514	512	509	506	493	479	468	479	493	506	509	512	514
60	396	406	424	429	432	434	436	434	432	429	424	406	396	406	424	429	432	434	436
65	321	332	348	350	352	354	355	354	352	350	348	332	321	332	348	350	352	354	355
70	243	257	268	270	271	273	274	273	271	270	268	257	243	257	268	270	271	273	274
75	166	183	189	191	192	193	194	193	192	191	189	183	166	183	189	191	192	193	194
80	93.1	107	113	115	116	116	117	116	116	115	113	107	93.1	107	113	115	116	116	117
85	33.2	42.6	45.7	45.6	44.3	43.5	43.2	43.5	44.3	45.6	45.7	42.6	33.2	42.6	45.7	45.6	44.3	43.5	43.2
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	916	917	917	916	916														
5	913	913	913	913	913														
10	902	902	902	902	902														
15	885	884	883	884	882														
20	861	859	857	856	855														
25	831	827	825	822	819														
30	795	789	785	781	777														
35	753	747	739	734	727														
40	708	699	688	681	673														
45	654	647	633	622	612														
50	586	582	574	559	548														
55	512	509	506	493	479														
60	434	432	429	424	406														
65	354	352	350	348	332														
70	273	271	270	268	257														
75	193	192	191	189	183														
80	116	116	115	113	107														
85	43.5	44.3	45.6	45.7	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@20W4000K	<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	0.161	19.2	0.992	11.67
277.0	60	0.074	19.7	0.959	15.26

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