

## Photometric Test Report

### Relevant Standards

- ☒ ANSI/IES LM-79-2019
- ☒ ANSI C82.77-2017

Prepared For

**RAB Lighting Inc.**

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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)	ANSI/IES LM-79:2019	1500		3022
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	166.0
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		18.2
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	6.70
			277V	7.13
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	0.9	120V	0.996
			277V	0.897
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019	7 steps	3985±275	4122
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥80		85.0
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79-2019 CIE13.3-1995	≥0		18
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		94
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)	ANSI/IES LM-79:2019	≥75%		74.4%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	22.5
		N/A	<22	
Spacing Criterion (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	0°-180°	1.0-2.0	1.20
		90°-270°	1.0-2.0	1.30
Input Voltage (V)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Cast		277.0
(Goniophotometer – Section 4.2)		Non-Worst Case		120.0
Input Current (A)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		0.073
(Goniophotometer – Section 4.2)		Non-Worst Case		0.145
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		18.2
(Goniophotometer – Section 4.2)		Non-Worst Case		17.3

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Build Level	Sample No.
1	Integrating Sphere Test	2025-07-19	SWISHFA1X4 @19W4000K	-	250715001-S1
2	Goniophotometer Test	2025-07-19	SWISHFA1X4 @19W4000K	-	250715001-S1
3	THD and PF Test	2025-07-19	SWISHFA1X4 @19W4000K	-	250715001-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 must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

### 3.0 Product Description

Luminaire Description: Model No. SWISHFA1X4 @19W4000K, 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>	SWISHFA1X4 @19W4000K	<b>Sample ID</b>	250715001-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

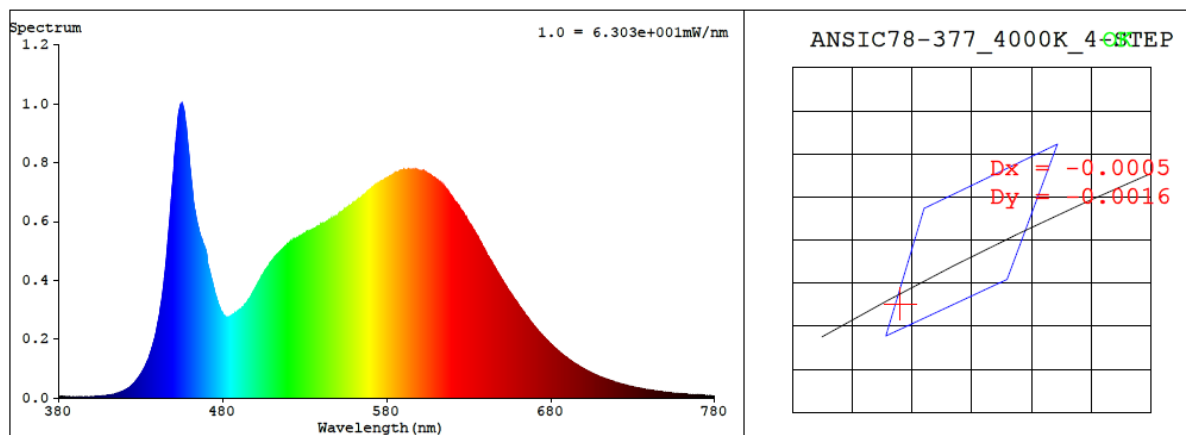
<b>Test Method</b>
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were 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 4<math>\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	0.145	17.3	0.996
277.0	60	0.073	18.2	0.897

CCT (K)	CRI	R9	Duv	SDCM	Rf	Rg	IES Rcs,h1
4122	85.0	18	-0.0006	3.5	84	94	-11%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3747$   $y = 0.3718$  /  $u' = 0.2233$   $v' = 0.4985$  ( $duv = -6.29e-04$ )

CCT= 4122K Prcp WL:  $L_d = 579.0\text{nm}$  Purity=24.0%

Peak WL:  $L_p = 455\text{nm}$  FWHM:  $\approx 23.8\text{nm}$  Ratio: R=18.3% G=77.5% B=4.2%

Render Index:  $R_a = 85.0$  AvgR = 79.1 TM30:  $R_f = 84$   $R_g = 95$

EEL: 0.08495 A++ Highest

R1 =84 R2 =93 R3 =96 R4 =82 R5 =84 R6 =89 R7 =86

R8 =67 R9 =18 R10=82 R11=81 R12=62 R13=87 R14=98 R15=79

## 4.1 Integrating Sphere Test

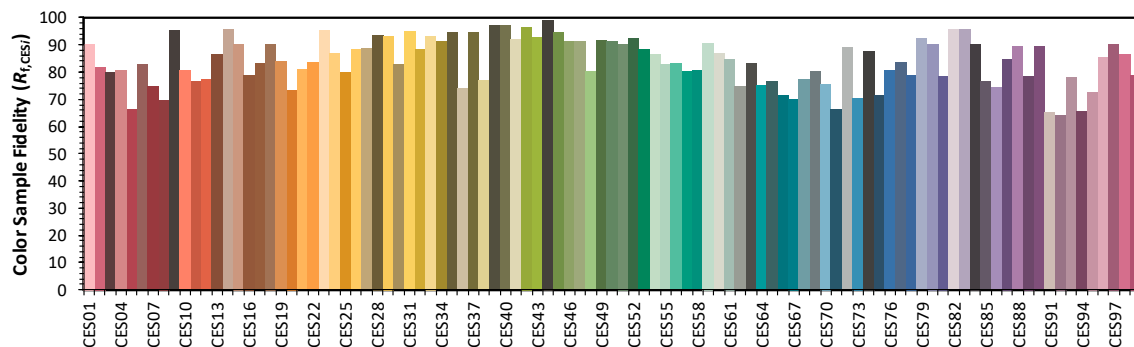
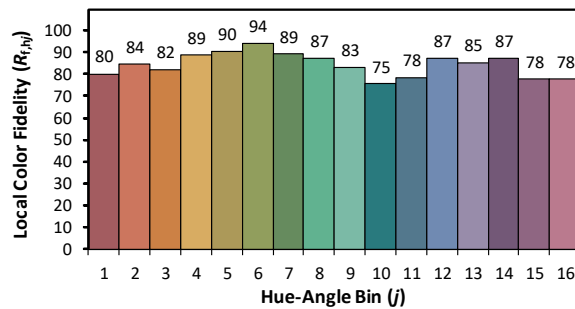
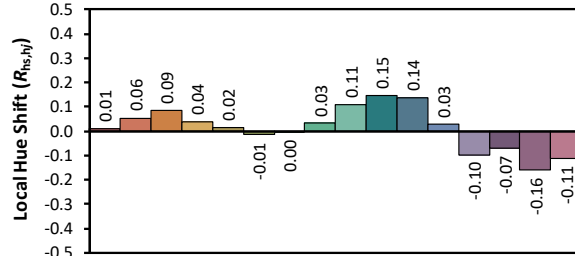
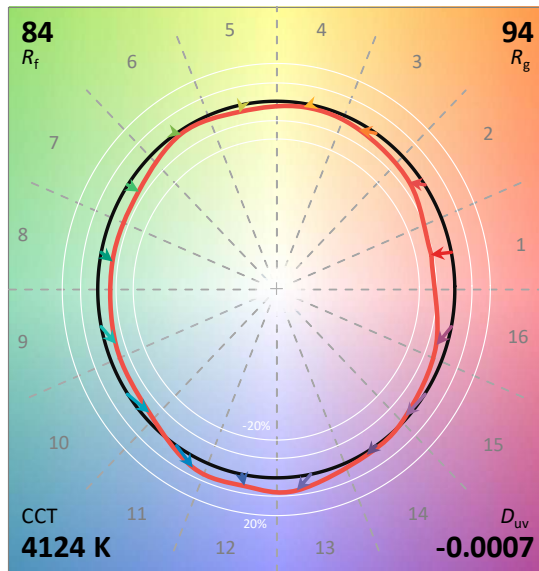
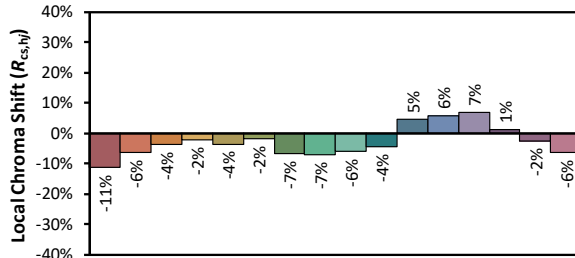
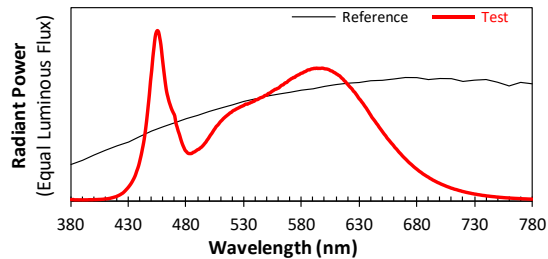
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2025/7/22

Model: SWISHFA1X4 @19W4000K



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

$x$  0.3747  
 $y$  0.3717  
 $u'$  0.2234  
 $v'$  0.4985

CIE 13.3-1995  
(CRI)

$R_a$  85  
 $R_g$  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	5.10E-06	447	5.57E-04	514	4.92E-04	581	7.49E-04	648	4.24E-04	715	6.22E-05
381	5.10E-06	448	6.24E-04	515	4.97E-04	582	7.54E-04	649	4.15E-04	716	6.01E-05
382	5.90E-06	449	7.02E-04	516	5.03E-04	583	7.56E-04	650	4.05E-04	717	5.81E-05
383	3.80E-06	450	7.63E-04	517	5.08E-04	584	7.60E-04	651	3.96E-04	718	5.66E-05
384	4.00E-06	451	8.39E-04	518	5.14E-04	585	7.65E-04	652	3.87E-04	719	5.41E-05
385	3.90E-06	452	9.00E-04	519	5.17E-04	586	7.67E-04	653	3.79E-04	720	5.26E-05
386	3.90E-06	453	9.59E-04	520	5.24E-04	587	7.67E-04	654	3.68E-04	721	5.10E-05
387	3.70E-06	454	9.87E-04	521	5.29E-04	588	7.71E-04	655	3.60E-04	722	4.92E-05
388	3.80E-06	455	9.97E-04	522	5.31E-04	589	7.73E-04	656	3.52E-04	723	4.75E-05
389	3.90E-06	456	9.88E-04	523	5.36E-04	590	7.74E-04	657	3.44E-04	724	4.63E-05
390	3.10E-06	457	9.53E-04	524	5.39E-04	591	7.76E-04	658	3.36E-04	725	4.46E-05
391	3.90E-06	458	9.13E-04	525	5.42E-04	592	7.75E-04	659	3.29E-04	726	4.35E-05
392	3.50E-06	459	8.50E-04	526	5.46E-04	593	7.77E-04	660	3.20E-04	727	4.20E-05
393	4.00E-06	460	7.90E-04	527	5.50E-04	594	7.75E-04	661	3.11E-04	728	4.04E-05
394	3.60E-06	461	7.34E-04	528	5.52E-04	595	7.76E-04	662	3.04E-04	729	3.94E-05
395	4.30E-06	462	6.81E-04	529	5.55E-04	596	7.75E-04	663	2.96E-04	730	3.77E-05
396	4.60E-06	463	6.37E-04	530	5.58E-04	597	7.76E-04	664	2.88E-04	731	3.71E-05
397	4.80E-06	464	6.09E-04	531	5.64E-04	598	7.77E-04	665	2.80E-04	732	3.57E-05
398	4.30E-06	465	5.82E-04	532	5.66E-04	599	7.75E-04	666	2.73E-04	733	3.44E-05
399	4.80E-06	466	5.62E-04	533	5.65E-04	600	7.73E-04	667	2.65E-04	734	3.36E-05
400	5.40E-06	467	5.42E-04	534	5.70E-04	601	7.72E-04	668	2.58E-04	735	3.24E-05
401	5.30E-06	468	5.25E-04	535	5.72E-04	602	7.72E-04	669	2.51E-04	736	3.12E-05
402	5.60E-06	469	5.11E-04	536	5.75E-04	603	7.70E-04	670	2.45E-04	737	3.00E-05
403	5.70E-06	470	4.96E-04	537	5.78E-04	604	7.67E-04	671	2.38E-04	738	2.94E-05
404	6.30E-06	471	4.55E-04	538	5.81E-04	605	7.62E-04	672	2.31E-04	739	2.85E-05
405	6.40E-06	472	4.32E-04	539	5.83E-04	606	7.60E-04	673	2.24E-04	740	2.74E-05
406	6.60E-06	473	4.07E-04	540	5.90E-04	607	7.57E-04	674	2.18E-04	741	2.64E-05
407	7.20E-06	474	3.88E-04	541	5.91E-04	608	7.52E-04	675	2.13E-04	742	2.59E-05
408	7.60E-06	475	3.65E-04	542	5.93E-04	609	7.49E-04	676	2.06E-04	743	2.50E-05
409	8.80E-06	476	3.43E-04	543	5.97E-04	610	7.44E-04	677	2.00E-04	744	2.41E-05
410	9.20E-06	477	3.25E-04	544	6.02E-04	611	7.40E-04	678	1.94E-04	745	2.34E-05
411	1.00E-05	478	3.10E-04	545	6.04E-04	612	7.35E-04	679	1.89E-04	746	2.27E-05
412	1.06E-05	479	2.95E-04	546	6.07E-04	613	7.32E-04	680	1.83E-04	747	2.22E-05
413	1.19E-05	480	2.88E-04	547	6.10E-04	614	7.24E-04	681	1.78E-04	748	2.14E-05
414	1.31E-05	481	2.80E-04	548	6.16E-04	615	7.17E-04	682	1.72E-04	749	2.04E-05
415	1.50E-05	482	2.76E-04	549	6.17E-04	616	7.12E-04	683	1.68E-04	750	2.01E-05
416	1.66E-05	483	2.76E-04	550	6.19E-04	617	7.03E-04	684	1.63E-04	751	1.94E-05
417	1.86E-05	484	2.76E-04	551	6.28E-04	618	6.98E-04	685	1.57E-04	752	1.87E-05
418	2.06E-05	485	2.77E-04	552	6.29E-04	619	6.89E-04	686	1.53E-04	753	1.81E-05
419	2.23E-05	486	2.83E-04	553	6.33E-04	620	6.81E-04	687	1.49E-04	754	1.77E-05
420	2.55E-05	487	2.85E-04	554	6.39E-04	621	6.74E-04	688	1.44E-04	755	1.68E-05
421	2.84E-05	488	2.90E-04	555	6.43E-04	622	6.66E-04	689	1.40E-04	756	1.65E-05
422	3.17E-05	489	2.94E-04	556	6.48E-04	623	6.60E-04	690	1.37E-04	757	1.58E-05
423	3.55E-05	490	2.99E-04	557	6.52E-04	624	6.52E-04	691	1.32E-04	758	1.55E-05
424	3.99E-05	491	3.01E-04	558	6.54E-04	625	6.42E-04	692	1.28E-04	759	1.52E-05
425	4.40E-05	492	3.08E-04	559	6.58E-04	626	6.36E-04	693	1.24E-04	760	1.47E-05
426	5.01E-05	493	3.12E-04	560	6.60E-04	627	6.26E-04	694	1.20E-04	761	1.42E-05
427	5.69E-05	494	3.19E-04	561	6.66E-04	628	6.17E-04	695	1.16E-04	762	1.36E-05
428	6.44E-05	495	3.26E-04	562	6.72E-04	629	6.07E-04	696	1.13E-04	763	1.32E-05
429	7.17E-05	496	3.35E-04	563	6.77E-04	630	5.97E-04	697	1.09E-04	764	1.28E-05
430	7.99E-05	497	3.43E-04	564	6.79E-04	631	5.90E-04	698	1.06E-04	765	1.24E-05
431	8.89E-05	498	3.54E-04	565	6.86E-04	632	5.80E-04	699	1.03E-04	766	1.21E-05
432	9.85E-05	499	3.63E-04	566	6.91E-04	633	5.72E-04	700	9.98E-05	767	1.18E-05
433	1.10E-04	500	3.73E-04	567	6.92E-04	634	5.62E-04	701	9.64E-05	768	1.15E-05
434	1.22E-04	501	3.84E-04	568	6.99E-04	635	5.52E-04	702	9.36E-05	769	1.12E-05
435	1.35E-04	502	3.93E-04	569	7.05E-04	636	5.43E-04	703	9.08E-05	770	1.09E-05
436	1.51E-04	503	4.03E-04	570	7.09E-04	637	5.32E-04	704	8.80E-05	771	1.03E-05
437	1.72E-04	504	4.14E-04	571	7.15E-04	638	5.22E-04	705	8.51E-05	772	9.90E-06
438	1.90E-04	505	4.24E-04	572	7.17E-04	639	5.10E-04	706	8.23E-05	773	9.70E-06
439	2.13E-04	506	4.34E-04	573	7.22E-04	640	5.00E-04	707	7.98E-05	774	9.50E-06
440	2.41E-04	507	4.41E-04	574	7.22E-04	641	4.88E-04	708	7.75E-05	775	9.20E-06
441	2.70E-04	508	4.48E-04	575	7.29E-04	642	4.80E-04	709	7.47E-05	776	8.80E-06
442	3.05E-04	509	4.58E-04	576	7.33E-04	643	4.71E-04	710	7.21E-05	777	8.50E-06
443	3.39E-04	510	4.65E-04	577	7.37E-04	644	4.62E-04	711	7.04E-05	778	8.30E-06
444	3.83E-04	511	4.72E-04	578	7.39E-04	645	4.52E-04	712	6.78E-05	779	8.20E-06
445	4.34E-04	512	4.79E-04	579	7.44E-04	646	4.44E-04	713	6.56E-05	780	8.30E-06
446	4.93E-04	513	4.86E-04	580	7.47E-04	647	4.33E-04	714	6.43E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

Model No.	SWISHFA1X4 @19W4000K	Sample ID	250715001-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	40.4

Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</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
WORST CASE	277.0	60	0.073	18.2	0.897
NON-WORST CASE	120.0	60	0.145	17.3	0.996

#### Test Result

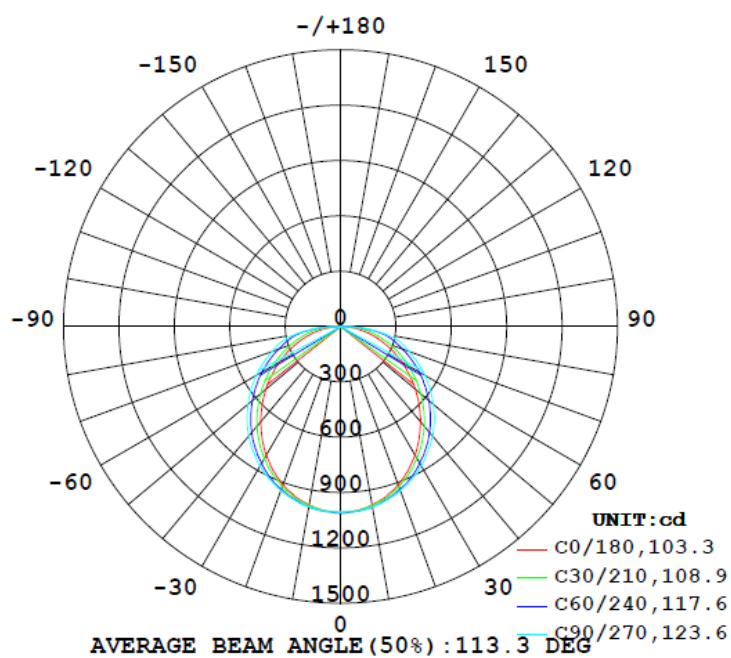
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement
	C0-180	C90-270	C0-180	C90-270		(0°-60°)
3022	162.3	172.9	103.3	123.3	166.0	74.4%

UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
19.3	22.5	1.20	1.30

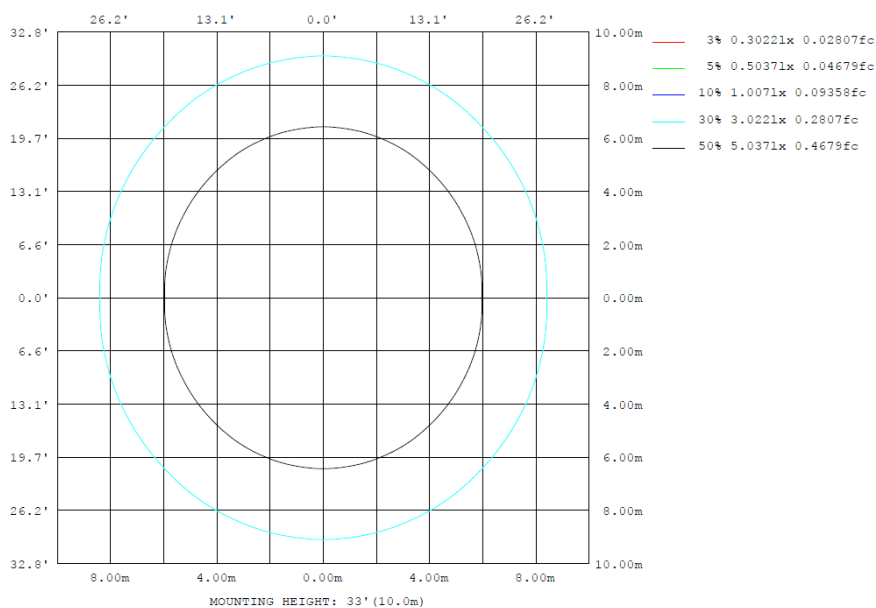
## 4.2 Goniophotometer Test

### Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	± zone	± total	%lum, lamp
10	983.4	989.3	993.3	989.3	983.4	989.3	993.3	989.3	0- 10	95.30	95.30	3.15, 3.15
20	911.1	930.0	947.0	930.0	911.1	930.0	947.0	930.0	10- 20	272.0	367.3	12.2, 12.2
30	805.6	840.2	873.2	840.2	805.6	840.2	873.2	840.2	20- 30	410.0	777.3	25.7, 25.7
40	673.4	724.6	775.5	724.6	673.4	724.6	775.5	724.6	30- 40	491.7	1269	42.4, 42
50	529.7	593.3	656.5	593.3	529.7	593.3	656.5	593.3	40- 50	510.5	1780	58.9, 58.9
60	381.1	455.2	527.0	455.2	381.1	455.2	527.0	455.2	50- 60	470.3	2250	74.4, 74.4
70	240.5	322.4	395.7	322.4	240.5	322.4	395.7	322.4	60- 70	384.4	2634	87.2, 87.2
80	111.6	200.8	255.0	200.8	111.6	200.8	255.0	200.8	70- 80	271.8	2906	96.2, 96.2
90	0	0	0	0	0	0	0	0	80- 90	115.9	3022	100, 100
100	0	0	0	0	0	0	0	0	90-100	0	3022	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	3022	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	3022	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	3022	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	3022	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	3022	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	3022	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	3022	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	3022	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	95.30	0-10	95.30	3.15%
10-20	271.97	0-20	367.27	12.15%
20-30	410.04	0-30	777.31	25.72%
30-40	491.72	0-40	1269.03	41.99%
40-50	510.50	0-50	1779.53	58.89%
50-60	470.33	0-60	2249.86	74.45%
60-70	384.37	0-70	2634.23	87.17%
70-80	271.84	0-80	2906.07	96.16%
80-90	115.95	0-90	3022.02	100.00%
90-100	0.00	0-100	3022.02	100.00%
100-110	0.00	0-110	3022.02	100.00%
110-120	0.00	0-120	3022.02	100.00%
120-130	0.00	0-130	3022.02	100.00%
130-140	0.00	0-140	3022.02	100.00%
140-150	0.00	0-150	3022.02	100.00%
150-160	0.00	0-160	3022.02	100.00%
160-170	0.00	0-170	3022.02	100.00%
170-180	0.00	0-180	3022.02	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	UGR Viewed Crosswise				UGR Viewed Endwise				
		10.7	12.4	11.1	12.7	13.0	12.2	13.9	12.5	14.2
	3H	12.5	14.0	12.9	14.3	14.7	14.6	16.1	14.9	16.4
	4H	13.2	14.7	13.6	15.0	15.4	15.8	17.2	16.2	17.5
	6H	13.8	15.1	14.2	15.5	15.9	16.9	18.2	17.3	18.6
	8H	14.0	15.3	14.4	15.7	16.1	17.3	18.6	17.7	19.0
	12H	14.1	15.4	14.6	15.8	16.2	17.7	18.9	18.1	19.3
4H	2H	11.6	13.1	12.0	13.4	13.8	12.7	14.2	13.1	14.5
	3H	13.7	14.9	14.1	15.3	15.7	15.4	16.6	15.8	17.0
	4H	14.5	15.7	15.0	16.1	16.5	16.8	17.9	17.2	18.3
	6H	15.3	16.2	15.7	16.7	17.1	18.1	19.1	18.6	19.5
	8H	15.5	16.4	16.0	16.9	17.3	18.7	19.6	19.1	20.1
	12H	15.7	16.6	16.2	17.0	17.5	19.2	20.0	19.7	20.5
8H	4H	15.2	16.2	15.7	16.6	17.1	17.1	18.1	17.6	18.5
	6H	16.2	17.0	16.7	17.4	17.9	18.7	19.5	19.2	20.0
	8H	16.6	17.3	17.1	17.8	18.3	19.4	20.1	19.9	20.6
	12H	16.9	17.5	17.4	18.0	18.6	20.0	20.7	20.5	21.1
12H	4H	15.4	16.3	15.9	16.7	17.2	17.2	18.0	17.7	18.5
	6H	16.5	17.2	17.0	17.6	18.2	18.8	19.5	19.3	20.0
	8H	17.0	17.6	17.5	18.1	18.6	19.6	20.2	20.1	20.7

Maximum UGR = 21.7

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										
X=2H	Y=2H	UGR Viewed Crosswise				UGR Viewed Endwise				
		14.5	16.2	14.9	16.5	16.8	16.0	17.7	16.3	18.0
	3H	16.3	17.8	16.7	18.1	18.5	18.4	19.9	18.7	20.2
	4H	17.0	18.5	17.4	18.8	19.2	19.6	21.0	20.0	21.3
	6H	17.6	18.9	18.0	19.3	19.7	20.7	22.0	21.1	22.4
	8H	17.8	19.1	18.2	19.5	19.9	21.1	22.4	21.5	22.8
	12H	17.9	19.2	18.4	19.6	20.0	21.5	22.7	21.9	23.1
4H	2H	15.4	16.9	15.8	17.2	17.6	16.5	18.0	16.9	18.3
	3H	17.5	18.7	17.9	19.1	19.5	19.2	20.4	19.6	20.8
	4H	18.3	19.5	18.8	19.9	20.3	20.6	21.7	21.0	22.1
	6H	19.1	20.0	19.5	20.5	20.9	21.9	22.9	22.4	23.3
	8H	19.3	20.2	19.8	20.7	21.1	22.5	23.4	22.9	23.9
	12H	19.5	20.4	20.0	20.8	21.3	23.0	23.8	23.5	24.3
8H	4H	19.0	20.0	19.5	20.4	20.9	20.9	21.9	21.4	22.3
	6H	20.0	20.8	20.5	21.2	21.7	22.5	23.3	23.0	23.8
	8H	20.4	21.1	20.9	21.6	22.1	23.2	23.9	23.7	24.4
	12H	20.7	21.3	21.2	21.8	22.4	23.8	24.5	24.3	24.9
12H	4H	19.2	20.1	19.7	20.5	21.0	21.0	21.8	21.5	22.3
	6H	20.3	21.0	20.8	21.4	22.0	22.6	23.3	23.1	23.8
	8H	20.8	21.4	21.3	21.9	22.4	23.4	24.0	23.9	24.5

Maximum UGR = 25.5

## 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	1007	1007	1008	1008	1013	1008	1008	1008	1013	1008	1008	1007	1007	1007	1008	1008	1013	1008	1008
5	1001	1000	999	1003	1005	1006	1003	1006	1005	1003	999	1000	1001	1000	999	1003	1005	1006	1003
10	983	983	985	989	993	994	993	994	993	989	985	983	983	985	989	993	994	993	983
15	955	957	960	962	970	976	973	976	970	962	960	957	955	957	960	962	970	976	973
20	911	918	925	930	939	947	947	947	939	930	925	918	911	918	925	930	939	947	947
25	863	870	877	889	903	910	912	910	903	889	877	870	863	870	877	889	903	910	912
30	806	816	826	840	856	868	873	868	856	840	826	816	806	816	826	840	856	868	873
35	742	755	768	785	806	820	826	820	806	785	768	755	742	755	768	785	806	820	826
40	673	688	707	725	749	767	775	767	749	725	707	688	673	688	707	725	749	767	775
45	601	616	637	661	688	707	717	707	688	661	637	616	601	616	637	661	688	707	717
50	530	545	566	593	624	645	656	645	624	593	566	545	530	545	566	593	624	645	656
55	453	471	496	525	557	581	593	581	557	525	496	471	453	471	496	525	557	581	593
60	381	397	423	455	491	518	527	518	491	455	423	397	381	397	423	455	491	518	527
65	310	327	354	390	423	450	460	450	423	390	354	327	310	327	354	390	423	450	460
70	240	257	284	322	357	385	396	385	357	322	284	257	240	257	284	322	357	385	396
75	174	190	220	258	297	326	337	326	297	258	220	190	174	190	220	258	297	326	337
80	112	127	160	201	232	249	255	249	232	201	160	127	112	127	160	201	232	249	255
85	53.2	70.6	102	123	136	140	141	140	136	123	102	70.6	53.2	70.6	102	123	136	140	141
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	1008	1013	1008	1008	1007														
5	1006	1005	1003	999	1000														
10	994	993	989	985	983														
15	976	970	962	960	957														
20	947	939	930	925	918														
25	910	903	889	877	870														
30	868	856	840	826	816														
35	820	806	785	768	755														
40	767	749	725	707	688														
45	707	688	661	637	616														
50	645	624	593	566	545														
55	581	557	525	496	471														
60	518	491	455	423	397														
65	450	423	390	354	327														
70	385	357	322	284	257														
75	326	297	258	220	190														
80	249	232	201	160	127														
85	140	136	123	102	70.6														
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>	SWISHFA1X4 @19W4000K	<b>Sample ID</b>	250715001-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 and Ansi C82.77: 2002 and ANSI C82.77-10:2020</p> <p>The total harmonic distortion shall be measured to the 40th order.</p> <p>The ambient temperature shall be maintained at 25±1°C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion was calculated.</p>

### Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD(%)
120.0	60	0.145	17.3	0.996	6.70
277.0	60	0.073	18.2	0.897	7.13

## 5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2024-11-07	2025-11-06
NTC-F01-006	2.0 meter Integrating Sphere	2024-11-07	2025-11-06
NTC-F01-012	Standard Lamp	2024-10-28	2025-10-27
NTC-F01-013	Standard Lamp	2024-10-28	2025-10-27
NTC-F01-031	Digital Power Meter	2024-08-06	2025-08-05
NTC-F01-019	Temperature & Humidity Meter	2024-10-29	2025-10-28

\*\*\*\*\*End of Report\*\*\*\*\*