

## Photometric Test Report

### Relevant Standards

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

Prepared For

**RAB Lighting Inc.**

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Issue Date: 2025-07-22

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		4300
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	151.9
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		28.3
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	11.71
			277V	8.32
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	0.9	120V	0.993
			277V	0.967
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019	7 steps	3465±245	3517
		4 steps	3465±124	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥80		83.5
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79-2019 CIE13.3-1995	≥0		11
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%		-12%
Zonal Lumen Requirement (0°-60°) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	≥75%		74.9%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	23.7
		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	1.28
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		0.106
(Goniophotometer – Section 4.2)		Non-Worst Case		0.232
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		28.3
(Goniophotometer – Section 4.2)		Non-Worst Case		27.6

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Build Level	Sample No.
1	Integrating Sphere Test		SWISHFA1X4 @29W3500K	-	250715001-S1
2	Goniophotometer Test		SWISHFA1X4 @29W3500K	-	250715001-S1
3	THD and PF Test		SWISHFA1X4 @29W3500K	-	250715001-S1

### Remark (If any):

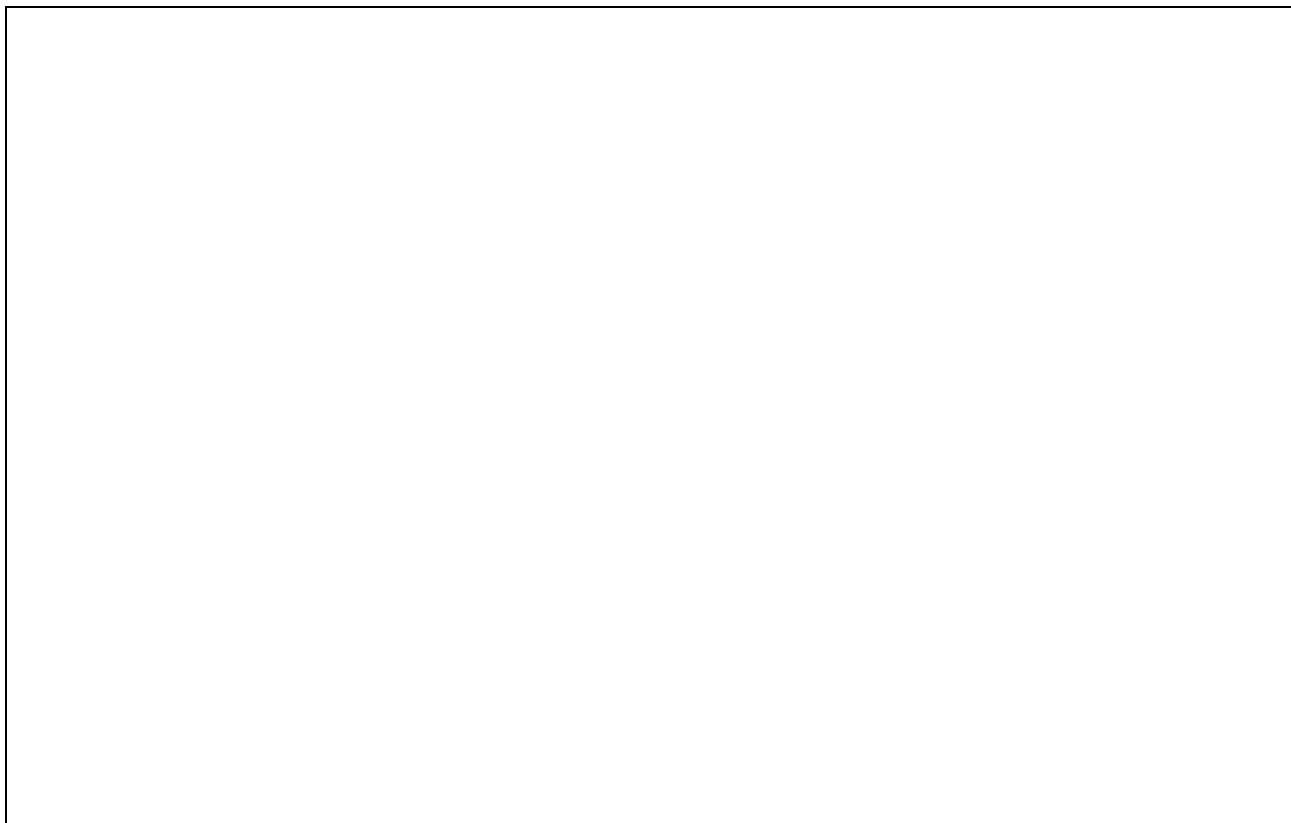
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

### 3.0 Product Description

Luminaire Description: Model No. SWISHFA1X4 @29W3500K, 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 @29W3500K	<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

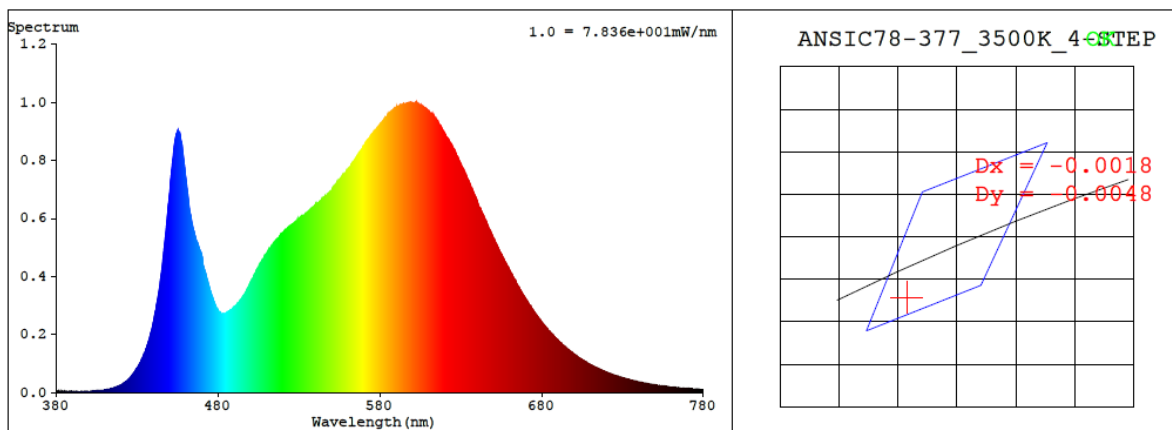
<b>Test Method</b>
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were 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	0.232	27.6	0.993
277.0	60	0.106	28.3	0.967

CCT (K)	CRI	R9	Duv	SDCM	Rf	Rg	IES Rcs,h1
3517	83.5	11	-0.0017	3.0	84	94	-12%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.4026$   $y = 0.3854$  /  $u' = 0.2361$   $v' = 0.5086$  ( $duv = -1.74e-03$ )

CCT= 3517K Prcp WL:  $L_d = 581.6\text{nm}$  Purity=36.5%

Peak WL:  $L_p = 599\text{nm}$  FWHM:  $=139.8\text{nm}$  Ratio: R=20.4% G=76.2% B=3.4%

Render Index:  $R_a = 83.5$  AvgR = 77.7 TM30:  $R_f = 84$   $R_g = 95$

EEL: 0.09252 A++ Highest

R1 =83 R2 =93 R3 =95 R4 =80 R5 =82 R6 =89 R7 =83

R8 =62 R9 =11 R10=81 R11=79 R12=66 R13=85 R14=98 R15=76

## 4.1 Integrating Sphere Test

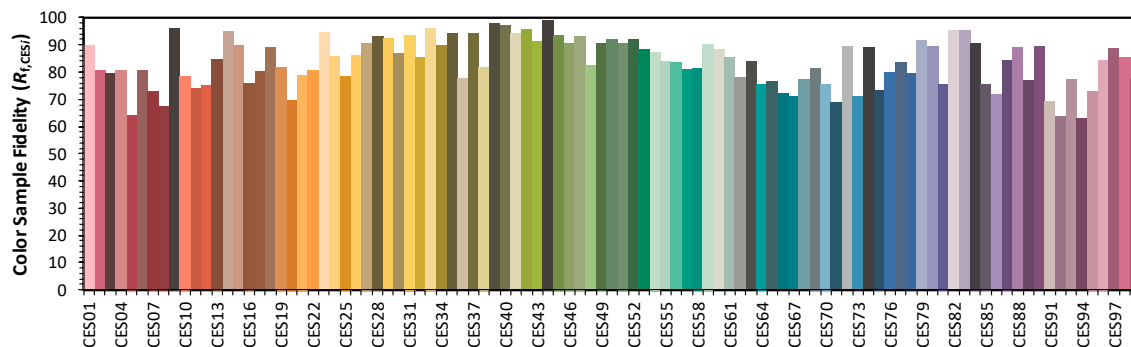
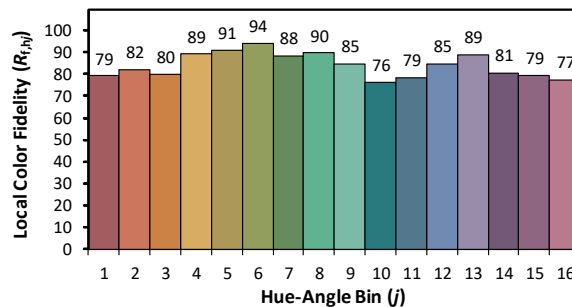
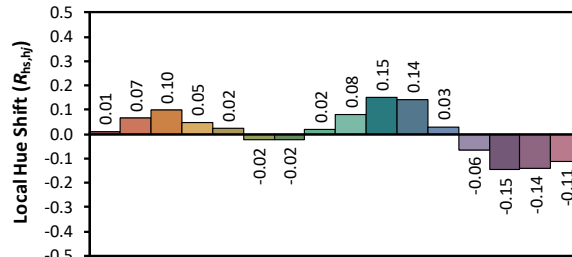
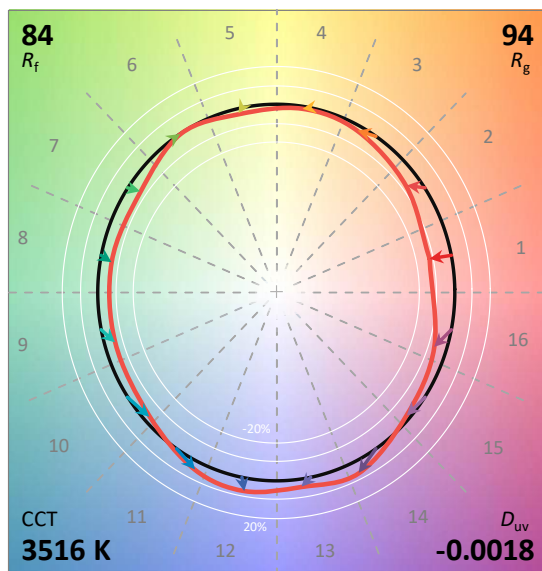
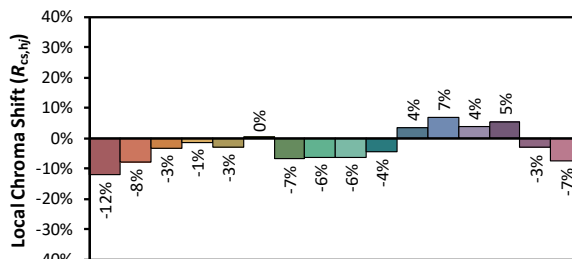
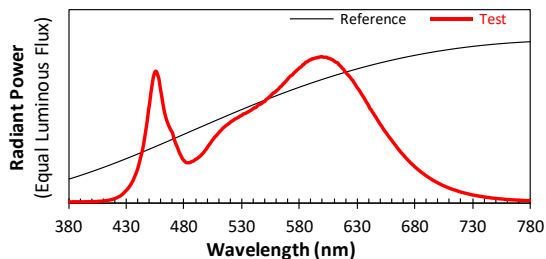
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2025/7/22

Model: SWISHFA1X4 @29W3500K



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

$x$  0.4026  
 $y$  0.3853  
 $u'$  0.2362  
 $v'$  0.5086

CIE 13.3-1995  
(CRI)

$R_a$  83  
 $R_g$  11

## 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	3.10E-06	447	5.13E-04	514	5.12E-04	581	9.28E-04	648	5.60E-04	715	8.34E-05
381	3.20E-06	448	5.67E-04	515	5.18E-04	582	9.35E-04	649	5.48E-04	716	8.05E-05
382	2.50E-06	449	6.31E-04	516	5.26E-04	583	9.45E-04	650	5.35E-04	717	7.79E-05
383	3.90E-06	450	6.83E-04	517	5.31E-04	584	9.48E-04	651	5.25E-04	718	7.52E-05
384	3.50E-06	451	7.48E-04	518	5.37E-04	585	9.59E-04	652	5.11E-04	719	7.21E-05
385	3.80E-06	452	8.01E-04	519	5.42E-04	586	9.63E-04	653	5.00E-04	720	7.01E-05
386	3.20E-06	453	8.51E-04	520	5.50E-04	587	9.66E-04	654	4.88E-04	721	6.80E-05
387	3.80E-06	454	8.82E-04	521	5.56E-04	588	9.73E-04	655	4.78E-04	722	6.61E-05
388	3.70E-06	455	8.99E-04	522	5.60E-04	589	9.77E-04	656	4.66E-04	723	6.41E-05
389	3.70E-06	456	8.95E-04	523	5.66E-04	590	9.79E-04	657	4.56E-04	724	6.21E-05
390	3.20E-06	457	8.73E-04	524	5.72E-04	591	9.86E-04	658	4.45E-04	725	5.99E-05
391	3.80E-06	458	8.47E-04	525	5.75E-04	592	9.85E-04	659	4.34E-04	726	5.83E-05
392	3.00E-06	459	7.94E-04	526	5.80E-04	593	9.89E-04	660	4.25E-04	727	5.64E-05
393	3.70E-06	460	7.47E-04	527	5.84E-04	594	9.90E-04	661	4.13E-04	728	5.40E-05
394	3.70E-06	461	6.99E-04	528	5.90E-04	595	9.94E-04	662	4.04E-04	729	5.25E-05
395	4.00E-06	462	6.52E-04	529	5.94E-04	596	9.92E-04	663	3.93E-04	730	5.04E-05
396	3.80E-06	463	6.13E-04	530	5.97E-04	597	9.97E-04	664	3.83E-04	731	4.96E-05
397	4.30E-06	464	5.83E-04	531	6.05E-04	598	9.98E-04	665	3.71E-04	732	4.73E-05
398	4.30E-06	465	5.57E-04	532	6.08E-04	599	1.00E-03	666	3.62E-04	733	4.64E-05
399	4.50E-06	466	5.36E-04	533	6.09E-04	600	9.98E-04	667	3.52E-04	734	4.54E-05
400	4.80E-06	467	5.17E-04	534	6.15E-04	601	9.95E-04	668	3.42E-04	735	4.32E-05
401	5.20E-06	468	5.01E-04	535	6.19E-04	602	9.96E-04	669	3.33E-04	736	4.20E-05
402	5.40E-06	469	4.87E-04	536	6.24E-04	603	9.96E-04	670	3.25E-04	737	4.08E-05
403	5.10E-06	470	4.72E-04	537	6.28E-04	604	9.93E-04	671	3.16E-04	738	3.97E-05
404	5.30E-06	471	4.37E-04	538	6.33E-04	605	9.88E-04	672	3.06E-04	739	3.82E-05
405	6.80E-06	472	4.16E-04	539	6.39E-04	606	9.88E-04	673	2.98E-04	740	3.71E-05
406	7.10E-06	473	3.95E-04	540	6.45E-04	607	9.83E-04	674	2.90E-04	741	3.60E-05
407	7.20E-06	474	3.78E-04	541	6.49E-04	608	9.80E-04	675	2.82E-04	742	3.45E-05
408	7.90E-06	475	3.56E-04	542	6.51E-04	609	9.76E-04	676	2.73E-04	743	3.36E-05
409	8.30E-06	476	3.36E-04	543	6.58E-04	610	9.70E-04	677	2.66E-04	744	3.26E-05
410	9.60E-06	477	3.21E-04	544	6.66E-04	611	9.64E-04	678	2.58E-04	745	3.15E-05
411	1.05E-05	478	3.06E-04	545	6.70E-04	612	9.60E-04	679	2.51E-04	746	3.01E-05
412	1.11E-05	479	2.92E-04	546	6.74E-04	613	9.57E-04	680	2.43E-04	747	2.93E-05
413	1.20E-05	480	2.84E-04	547	6.78E-04	614	9.46E-04	681	2.37E-04	748	2.84E-05
414	1.36E-05	481	2.76E-04	548	6.85E-04	615	9.38E-04	682	2.29E-04	749	2.77E-05
415	1.53E-05	482	2.72E-04	549	6.90E-04	616	9.31E-04	683	2.23E-04	750	2.68E-05
416	1.71E-05	483	2.72E-04	550	6.94E-04	617	9.20E-04	684	2.16E-04	751	2.61E-05
417	1.90E-05	484	2.72E-04	551	7.06E-04	618	9.14E-04	685	2.11E-04	752	2.51E-05
418	2.16E-05	485	2.73E-04	552	7.11E-04	619	9.03E-04	686	2.04E-04	753	2.45E-05
419	2.36E-05	486	2.78E-04	553	7.17E-04	620	8.93E-04	687	1.99E-04	754	2.38E-05
420	2.62E-05	487	2.81E-04	554	7.26E-04	621	8.82E-04	688	1.92E-04	755	2.34E-05
421	2.95E-05	488	2.84E-04	555	7.32E-04	622	8.75E-04	689	1.86E-04	756	2.25E-05
422	3.38E-05	489	2.90E-04	556	7.40E-04	623	8.66E-04	690	1.81E-04	757	2.17E-05
423	3.76E-05	490	2.96E-04	557	7.49E-04	624	8.57E-04	691	1.75E-04	758	2.09E-05
424	4.19E-05	491	2.99E-04	558	7.53E-04	625	8.45E-04	692	1.71E-04	759	2.00E-05
425	4.64E-05	492	3.06E-04	559	7.58E-04	626	8.37E-04	693	1.64E-04	760	1.94E-05
426	5.30E-05	493	3.11E-04	560	7.67E-04	627	8.24E-04	694	1.60E-04	761	1.91E-05
427	6.00E-05	494	3.19E-04	561	7.73E-04	628	8.12E-04	695	1.55E-04	762	1.88E-05
428	6.80E-05	495	3.27E-04	562	7.81E-04	629	7.99E-04	696	1.49E-04	763	1.79E-05
429	7.61E-05	496	3.36E-04	563	7.91E-04	630	7.87E-04	697	1.46E-04	764	1.71E-05
430	8.43E-05	497	3.44E-04	564	7.96E-04	631	7.77E-04	698	1.41E-04	765	1.70E-05
431	9.34E-05	498	3.56E-04	565	8.05E-04	632	7.65E-04	699	1.38E-04	766	1.64E-05
432	1.03E-04	499	3.65E-04	566	8.14E-04	633	7.53E-04	700	1.33E-04	767	1.61E-05
433	1.15E-04	500	3.77E-04	567	8.21E-04	634	7.39E-04	701	1.29E-04	768	1.53E-05
434	1.28E-04	501	3.90E-04	568	8.30E-04	635	7.28E-04	702	1.25E-04	769	1.48E-05
435	1.41E-04	502	3.99E-04	569	8.39E-04	636	7.16E-04	703	1.20E-04	770	1.42E-05
436	1.57E-04	503	4.10E-04	570	8.49E-04	637	7.01E-04	704	1.17E-04	771	1.41E-05
437	1.77E-04	504	4.22E-04	571	8.58E-04	638	6.87E-04	705	1.14E-04	772	1.36E-05
438	1.95E-04	505	4.32E-04	572	8.65E-04	639	6.75E-04	706	1.10E-04	773	1.32E-05
439	2.17E-04	506	4.43E-04	573	8.72E-04	640	6.61E-04	707	1.06E-04	774	1.29E-05
440	2.43E-04	507	4.52E-04	574	8.76E-04	641	6.43E-04	708	1.03E-04	775	1.25E-05
441	2.72E-04	508	4.60E-04	575	8.87E-04	642	6.36E-04	709	9.99E-05	776	1.19E-05
442	3.04E-04	509	4.70E-04	576	8.94E-04	643	6.22E-04	710	9.65E-05	777	1.19E-05
443	3.33E-04	510	4.78E-04	577	9.01E-04	644	6.11E-04	711	9.39E-05	778	1.14E-05
444	3.69E-04	511	4.88E-04	578	9.09E-04	645	5.97E-04	712	9.05E-05	779	1.13E-05
445	4.12E-04	512	4.95E-04	579	9.15E-04	646	5.86E-04	713	8.81E-05	780	1.14E-05
446	4.62E-04	513	5.04E-04	580	9.23E-04	647	5.73E-04	714	8.56E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	SWISHFA1X4 @29W3500K	<b>Sample ID</b>	250715001-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.0	<b>Humidity (%RH)</b>	40.4

<b>Test Method</b>
<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
<b>WORST CASE</b>	277.0	60	0.106	28.3	0.967
<b>NON-WORST CASE</b>	120.0	60	0.232	27.6	0.993

#### Test Result

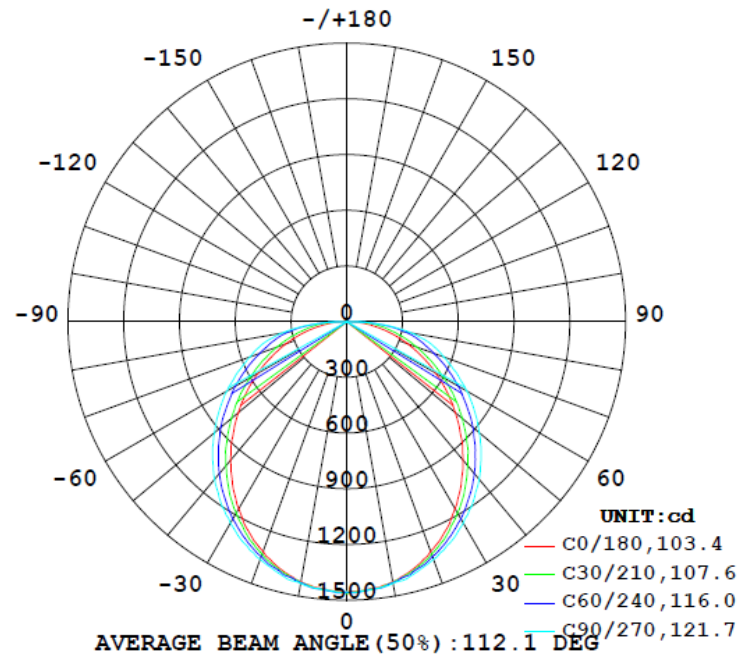
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement ( $0^\circ$ - $60^\circ$ )
	C0-180	C90-270	C0-180	C90-270		
4300	162.1	172.8	103.2	121.8	151.9	74.9%

UGR		Spacing Criterion	
Crosswise	Endwise	( $0^\circ$ - $180^\circ$ )	( $90^\circ$ - $270^\circ$ )
20.6	23.7	1.20	1.28

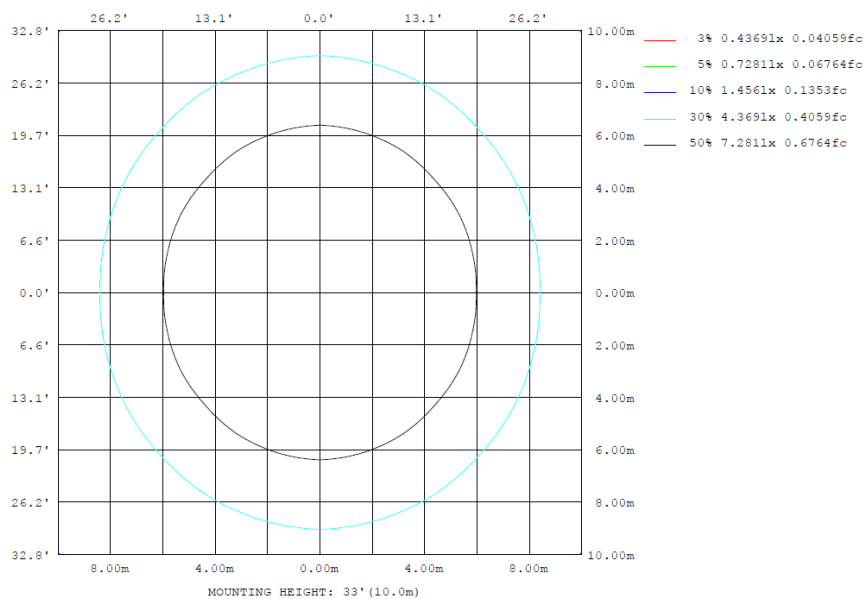
## 4.2 Goniophotometer Test

### 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	$\gamma$	$\Phi$ zone	$\Phi$ total	$\Phi$ lum, lamp
10	1421	1418	1430	1418	1421	1418	1430	1418	0- 10	137.4	137.4	3.2,3.2
20	1317	1337	1362	1337	1317	1337	1362	1337	10- 20	391.7	529.1	12.3,12.3
30	1163	1202	1253	1202	1163	1202	1253	1202	20- 30	588.9	1118	26,26
40	972.2	1032	1107	1032	972.2	1032	1107	1032	30- 40	704.5	1822	42.4,42.4
50	761.3	841.5	929.3	841.5	761.3	841.5	929.3	841.5	40- 50	728.5	2551	59.3,59.3
60	549.7	640.9	744.1	640.9	549.7	640.9	744.1	640.9	50- 60	667.7	3219	74.9,74.9
70	348.1	448.1	553.9	448.1	348.1	448.1	553.9	448.1	60- 70	541.6	3760	87.4,87.4
80	162.2	276.2	353.6	276.2	162.2	276.2	353.6	276.2	70- 80	379.0	4139	96.3,96.3
90	0	0	0	0	0	0	0	0	80- 90	160.8	4300	100,100
100	0	0	0	0	0	0	0	0	90-100	0	4300	100,100
110	0	0	0	0	0	0	0	0	100-110	0	4300	100,100
120	0	0	0	0	0	0	0	0	110-120	0	4300	100,100
130	0	0	0	0	0	0	0	0	120-130	0	4300	100,100
140	0	0	0	0	0	0	0	0	130-140	0	4300	100,100
150	0	0	0	0	0	0	0	0	140-150	0	4300	100,100
160	0	0	0	0	0	0	0	0	150-160	0	4300	100,100
170	0	0	0	0	0	0	0	0	160-170	0	4300	100,100
180	0	0	0	0	0	0	0	0	170-180	0	4300	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	137.45	0-10	137.45	3.20%
10-20	391.66	0-20	529.11	12.30%
20-30	588.90	0-30	1118.01	26.00%
30-40	704.48	0-40	1822.49	42.38%
40-50	728.53	0-50	2551.02	59.32%
50-60	667.66	0-60	3218.68	74.85%
60-70	541.60	0-70	3760.28	87.45%
70-80	378.98	0-80	4139.26	96.26%
80-90	160.82	0-90	4300.08	100.00%
90-100	0.00	0-100	4300.08	100.00%
100-110	0.00	0-110	4300.08	100.00%
110-120	0.00	0-120	4300.08	100.00%
120-130	0.00	0-130	4300.08	100.00%
130-140	0.00	0-140	4300.08	100.00%
140-150	0.00	0-150	4300.08	100.00%
150-160	0.00	0-160	4300.08	100.00%
160-170	0.00	0-170	4300.08	100.00%
170-180	0.00	0-180	4300.08	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	10.7	12.4	11.1	12.7	13.0	12.1	13.8	12.5	14.1	14.4
	3H	12.5	14.1	12.9	14.4	14.7	14.5	16.0	14.9	16.3	16.7
	4H	13.2	14.7	13.6	15.0	15.4	15.6	17.1	16.0	17.4	17.8
	6H	13.8	15.1	14.2	15.5	15.9	16.7	18.1	17.1	18.4	18.8
	8H	14.0	15.3	14.4	15.7	16.1	17.2	18.5	17.6	18.9	19.3
	12H	14.2	15.4	14.6	15.8	16.2	17.6	18.8	18.0	19.2	19.6
4H	2H	11.6	13.0	12.0	13.4	13.8	12.7	14.1	13.1	14.4	14.8
	3H	13.7	14.9	14.1	15.3	15.7	15.3	16.5	15.7	16.9	17.3
	4H	14.5	15.6	14.9	16.0	16.5	16.7	17.8	17.1	18.2	18.6
	6H	15.2	16.2	15.7	16.6	17.1	18.0	19.0	18.4	19.4	19.9
	8H	15.5	16.4	16.0	16.8	17.3	18.6	19.5	19.0	19.9	20.4
	12H	15.7	16.5	16.2	17.0	17.5	19.0	19.9	19.5	20.3	20.8
8H	4H	15.2	16.1	15.7	16.6	17.0	17.0	17.9	17.5	18.4	18.8
	6H	16.1	16.9	16.6	17.4	17.8	18.5	19.3	19.0	19.8	20.3
	8H	16.5	17.2	17.0	17.7	18.2	19.2	19.9	19.7	20.4	20.9
	12H	16.8	17.4	17.3	17.9	18.5	19.9	20.5	20.4	21.0	21.6
12H	4H	15.4	16.2	15.9	16.7	17.1	17.1	17.9	17.5	18.4	18.8
	6H	16.4	17.1	16.9	17.6	18.1	18.6	19.3	19.2	19.8	20.3
	8H	16.9	17.5	17.4	18.0	18.5	19.4	20.0	19.9	20.5	21.1

Maximum UGR = 21.6

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	15.8	17.5	16.2	17.8	18.1	17.2	18.9	17.6	19.2	19.5
	3H	17.6	19.2	18.0	19.5	19.8	19.6	21.1	20.0	21.4	21.8
	4H	18.3	19.8	18.7	20.1	20.5	20.7	22.2	21.1	22.5	22.9
	6H	18.9	20.2	19.3	20.6	21.0	21.8	23.2	22.2	23.5	23.9
	8H	19.1	20.4	19.5	20.8	21.2	22.3	23.6	22.7	24.0	24.4
	12H	19.3	20.5	19.7	20.9	21.3	22.7	23.9	23.1	24.3	24.7
4H	2H	16.7	18.1	17.1	18.5	18.9	17.8	19.2	18.2	19.5	19.9
	3H	18.8	20.0	19.2	20.4	20.8	20.4	21.6	20.8	22.0	22.4
	4H	19.6	20.7	20.0	21.1	21.6	21.8	22.9	22.2	23.3	23.7
	6H	20.3	21.3	20.8	21.7	22.2	23.1	24.1	23.5	24.5	25.0
	8H	20.6	21.5	21.1	21.9	22.4	23.7	24.6	24.1	25.0	25.5
	12H	20.8	21.6	21.3	22.1	22.6	24.1	25.0	24.6	25.4	25.9
8H	4H	20.3	21.2	20.8	21.7	22.1	22.1	23.0	22.6	23.5	23.9
	6H	21.2	22.0	21.7	22.5	22.9	23.6	24.4	24.1	24.9	25.4
	8H	21.6	22.3	22.1	22.8	23.3	24.3	25.0	24.8	25.5	26.0
	12H	21.9	22.5	22.4	23.0	23.6	25.0	25.6	25.5	26.1	26.7
12H	4H	20.5	21.3	21.0	21.8	22.2	22.2	23.0	22.6	23.5	23.9
	6H	21.5	22.2	22.0	22.7	23.2	23.7	24.4	24.3	24.9	25.4
	8H	22.0	22.6	22.5	23.1	23.6	24.5	25.1	25.0	25.6	26.2

Maximum UGR = 26.7

## 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	1456	1460	1463	1454	1458	1450	1455	1450	1458	1454	1463	1460	1456	1460	1463	1454	1458	1450	1455
5	1443	1449	1445	1442	1447	1449	1451	1449	1447	1442	1445	1449	1443	1449	1445	1442	1447	1449	1451
10	1421	1421	1427	1418	1427	1424	1430	1424	1427	1418	1427	1421	1421	1427	1418	1427	1424	1430	1427
15	1379	1382	1388	1382	1391	1392	1404	1392	1391	1382	1388	1382	1379	1382	1388	1382	1391	1392	1404
20	1317	1327	1332	1337	1346	1352	1362	1352	1346	1337	1332	1327	1317	1327	1332	1337	1346	1352	1362
25	1248	1256	1268	1272	1291	1301	1314	1301	1291	1272	1268	1256	1248	1256	1268	1272	1291	1301	1314
30	1163	1179	1189	1202	1227	1235	1253	1235	1227	1202	1189	1179	1163	1179	1189	1202	1227	1235	1253
35	1072	1088	1106	1121	1150	1168	1185	1168	1150	1121	1106	1088	1072	1088	1106	1121	1150	1168	1185
40	972	990	1013	1032	1067	1086	1107	1086	1067	1032	1013	990	972	990	1013	1032	1067	1086	1107
45	867	887	913	939	979	1003	1022	1003	979	939	913	887	867	887	913	939	979	1003	1022
50	761	783	812	842	886	909	929	909	886	842	812	783	761	783	812	842	886	909	929
55	656	675	705	744	787	818	839	818	787	744	705	675	656	675	705	744	787	818	839
60	550	569	602	641	693	725	744	725	693	641	602	569	550	569	602	641	693	725	744
65	447	465	500	543	595	627	651	627	595	543	500	465	447	465	500	543	595	627	651
70	348	366	403	448	499	536	554	536	499	448	403	366	348	366	403	448	499	536	554
75	251	268	307	357	413	453	472	453	413	357	307	268	251	268	307	357	413	453	472
80	162	176	220	276	321	343	354	343	321	276	220	176	162	176	220	276	321	343	354
85	76.7	96.9	138	168	188	197	201	197	188	168	138	96.9	76.7	96.9	138	168	188	197	201
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	1450	1458	1454	1463	1460														
5	1449	1447	1442	1445	1449														
10	1424	1427	1418	1427	1421														
15	1392	1391	1382	1388	1382														
20	1352	1346	1337	1332	1327														
25	1301	1291	1272	1268	1256														
30	1235	1227	1202	1189	1179														
35	1168	1150	1121	1106	1088														
40	1086	1067	1032	1013	990														
45	1003	979	939	913	887														
50	909	886	842	812	783														
55	818	787	744	705	675														
60	725	693	641	602	569														
65	627	595	543	500	465														
70	536	499	448	403	366														
75	453	413	357	307	268														
80	343	321	276	220	176														
85	197	188	168	138	96.9														
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 @29W3500K	<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	0.232	27.6	0.993	11.71
277.0	60	0.106	28.3	0.967	8.32

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