

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77-2017

Prepared For

RAB Lighting Inc.

Prepared By

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Issue Date: 2024-01-30

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	IES LM-79-2008	1500		2810
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	142.6
		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	11.30
			277V	14.32
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.991
			277V	0.895
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4035
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		84.9
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		20
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%		74.1%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	19.9
		N/A	<22	
Spacing Criterion (Goniophotometer – Section 4.2)	IES LM-79-2008	0°-180°	1.0-2.0	1.26
		90°-270°	1.0-2.0	1.32
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		0.080
(Goniophotometer – Section 4.2)		Non-Worst Case		0.159
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.7
(Goniophotometer – Section 4.2)		Non-Worst Case		18.9

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-01-28	C-SWISH2X4@20W4000K	240119002-S1
2	Goniophotometer Test	2024-01-28	C-SWISH2X4@20W4000K	240119002-S1
3	THD and PF Test	2024-01-28	C-SWISH2X4@20W4000K	240119002-S1

Remark (If any)

- The results contained in this report pertain only to the tested samples.
- This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
- This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

3.0 Product Description

Luminaire Description: Model No. C-SWISH2X4@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

Model No.	C-SWISH2X4@20W4000K	Sample ID	240119002-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

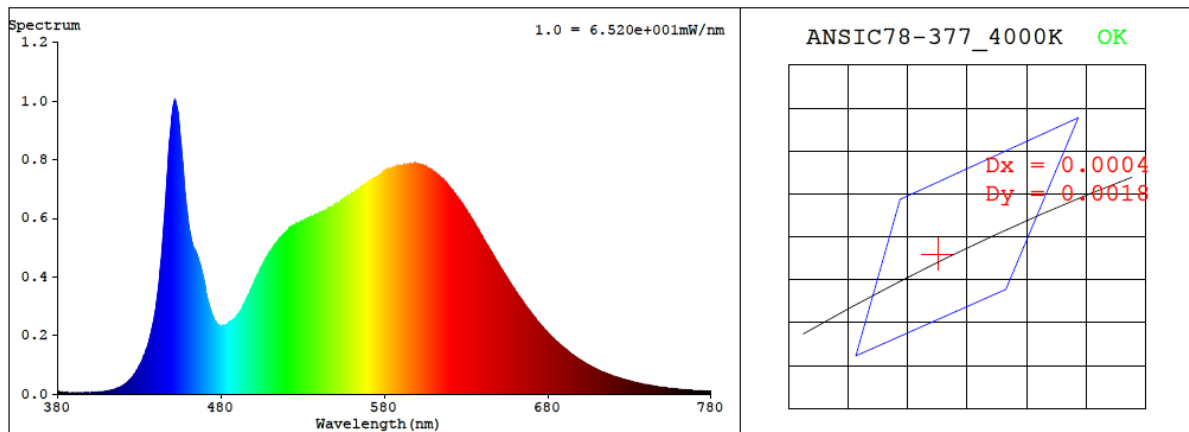
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25\pm 1^{\circ}\text{C}$.</p> <p>The sample measurements 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	0.159	18.9	0.991
277.0	60	0.080	19.7	0.895

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4035	84.9	20	0.0007	85	96	-10%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3793$ $y = 0.3776$ / $u' = 0.2240$ $v' = 0.5018$ ($duv=7.28e-04$)

CCT= 4035K Prcp WL: Ld=578.5nm Purity=27.2%

Peak WL: Lp=452nm FWHM: =19.2nm Ratio:R=18.5% G=77.9% B=3.6%

Render Index: Ra = 84.9 AvgR = 78.7 TM30:Rf=85 Rg=96

EEL: 0.09304 A++ Highest

R1 =84 R2 =90 R3 =95 R4 =84 R5 =83 R6 =86 R7 =88

R8 =69 R9 =20 R10=77 R11=83 R12=61 R13=86 R14=97 R15=78

4.1 Integrating Sphere Test

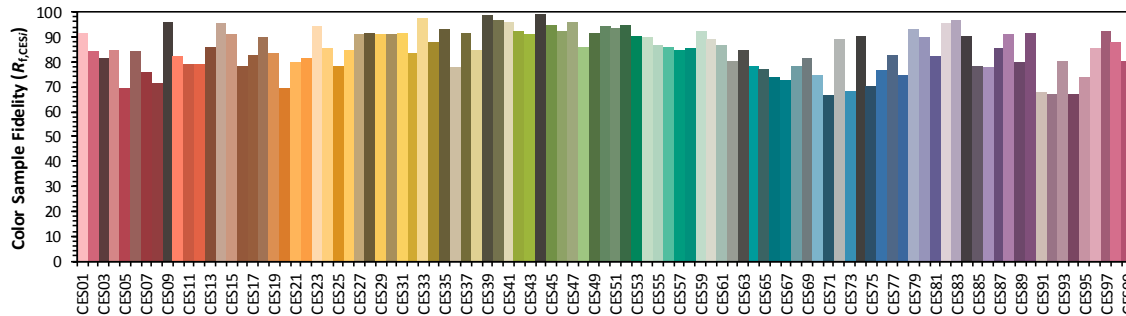
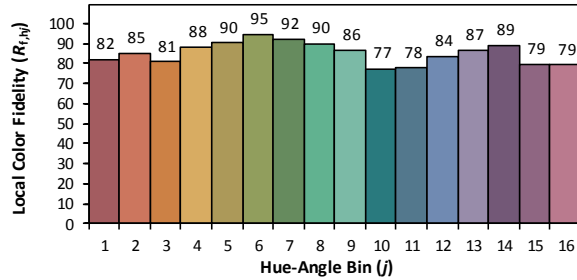
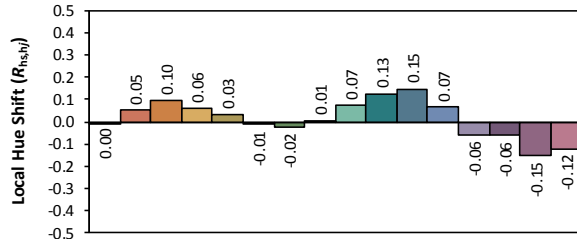
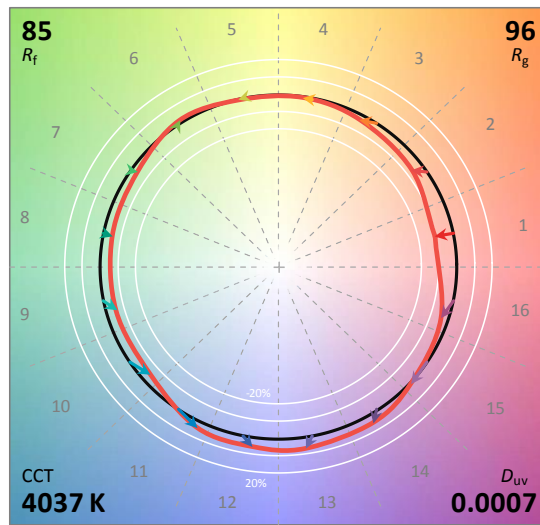
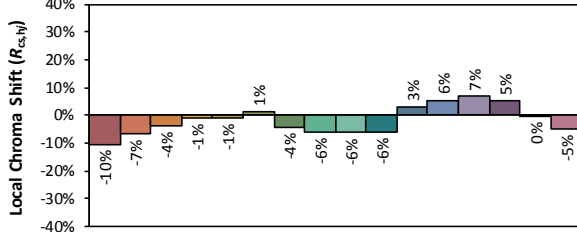
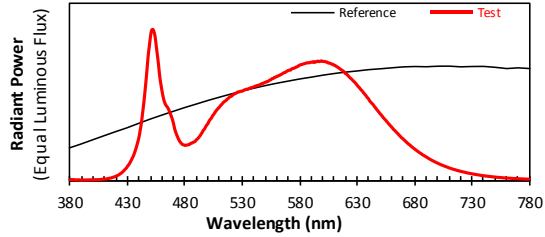
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/1/30

Model: C-SWISH2X4@20W4000K



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

x 0.3793
 y 0.3775
 u' 0.2241
 v' 0.5017

CIE 13.3-1995
(CRI)

R_a 85
 R_g 20

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	5.80E-06	447	7.36E-04	514	5.17E-04	581	7.62E-04	648	4.61E-04	715	7.27E-05
381	7.20E-06	448	8.24E-04	515	5.23E-04	582	7.63E-04	649	4.51E-04	716	7.02E-05
382	5.00E-06	449	8.86E-04	516	5.28E-04	583	7.67E-04	650	4.41E-04	717	6.78E-05
383	6.80E-06	450	9.50E-04	517	5.37E-04	584	7.68E-04	651	4.33E-04	718	6.57E-05
384	5.40E-06	451	9.88E-04	518	5.42E-04	585	7.71E-04	652	4.24E-04	719	6.40E-05
385	4.30E-06	452	9.94E-04	519	5.49E-04	586	7.73E-04	653	4.13E-04	720	6.16E-05
386	4.90E-06	453	9.78E-04	520	5.53E-04	587	7.75E-04	654	4.05E-04	721	5.98E-05
387	5.20E-06	454	9.46E-04	521	5.58E-04	588	7.74E-04	655	3.97E-04	722	5.82E-05
388	4.80E-06	455	8.84E-04	522	5.64E-04	589	7.77E-04	656	3.89E-04	723	5.64E-05
389	3.60E-06	456	8.24E-04	523	5.69E-04	590	7.78E-04	657	3.79E-04	724	5.48E-05
390	3.70E-06	457	7.60E-04	524	5.73E-04	591	7.78E-04	658	3.71E-04	725	5.29E-05
391	4.30E-06	458	6.87E-04	525	5.76E-04	592	7.82E-04	659	3.62E-04	726	5.09E-05
392	4.40E-06	459	6.36E-04	526	5.83E-04	593	7.77E-04	660	3.54E-04	727	4.93E-05
393	4.00E-06	460	5.90E-04	527	5.82E-04	594	7.82E-04	661	3.45E-04	728	4.81E-05
394	4.30E-06	461	5.50E-04	528	5.86E-04	595	7.82E-04	662	3.36E-04	729	4.62E-05
395	4.40E-06	462	5.21E-04	529	5.88E-04	596	7.86E-04	663	3.29E-04	730	4.53E-05
396	4.80E-06	463	5.01E-04	530	5.88E-04	597	7.82E-04	664	3.21E-04	731	4.36E-05
397	4.50E-06	464	4.90E-04	531	5.93E-04	598	7.84E-04	665	3.13E-04	732	4.24E-05
398	5.10E-06	465	4.79E-04	532	5.96E-04	599	7.87E-04	666	3.06E-04	733	4.08E-05
399	5.40E-06	466	4.64E-04	533	5.99E-04	600	7.84E-04	667	2.97E-04	734	3.97E-05
400	4.90E-06	467	4.45E-04	534	6.01E-04	601	7.83E-04	668	2.89E-04	735	3.85E-05
401	5.80E-06	468	4.26E-04	535	6.02E-04	602	7.83E-04	669	2.81E-04	736	3.70E-05
402	6.00E-06	469	4.04E-04	536	6.06E-04	603	7.80E-04	670	2.76E-04	737	3.60E-05
403	5.90E-06	470	3.77E-04	537	6.09E-04	604	7.79E-04	671	2.68E-04	738	3.46E-05
404	6.30E-06	471	3.41E-04	538	6.11E-04	605	7.73E-04	672	2.62E-04	739	3.33E-05
405	6.10E-06	472	3.18E-04	539	6.13E-04	606	7.73E-04	673	2.54E-04	740	3.25E-05
406	7.30E-06	473	2.98E-04	540	6.16E-04	607	7.70E-04	674	2.47E-04	741	3.15E-05
407	8.00E-06	474	2.80E-04	541	6.20E-04	608	7.65E-04	675	2.40E-04	742	3.05E-05
408	8.60E-06	475	2.64E-04	542	6.22E-04	609	7.65E-04	676	2.35E-04	743	2.95E-05
409	8.70E-06	476	2.53E-04	543	6.25E-04	610	7.59E-04	677	2.28E-04	744	2.87E-05
410	9.90E-06	477	2.44E-04	544	6.25E-04	611	7.57E-04	678	2.21E-04	745	2.75E-05
411	1.05E-05	478	2.37E-04	545	6.30E-04	612	7.51E-04	679	2.15E-04	746	2.68E-05
412	1.14E-05	479	2.35E-04	546	6.33E-04	613	7.47E-04	680	2.09E-04	747	2.58E-05
413	1.37E-05	480	2.31E-04	547	6.38E-04	614	7.41E-04	681	2.04E-04	748	2.50E-05
414	1.50E-05	481	2.33E-04	548	6.39E-04	615	7.36E-04	682	1.98E-04	749	2.43E-05
415	1.66E-05	482	2.34E-04	549	6.43E-04	616	7.30E-04	683	1.92E-04	750	2.37E-05
416	1.85E-05	483	2.36E-04	550	6.45E-04	617	7.25E-04	684	1.87E-04	751	2.30E-05
417	2.12E-05	484	2.38E-04	551	6.50E-04	618	7.20E-04	685	1.81E-04	752	2.19E-05
418	2.31E-05	485	2.45E-04	552	6.51E-04	619	7.13E-04	686	1.77E-04	753	2.13E-05
419	2.64E-05	486	2.46E-04	553	6.55E-04	620	7.04E-04	687	1.71E-04	754	2.07E-05
420	2.91E-05	487	2.51E-04	554	6.61E-04	621	7.00E-04	688	1.67E-04	755	2.01E-05
421	3.31E-05	488	2.54E-04	555	6.64E-04	622	6.93E-04	689	1.62E-04	756	1.95E-05
422	3.63E-05	489	2.59E-04	556	6.71E-04	623	6.83E-04	690	1.57E-04	757	1.88E-05
423	4.16E-05	490	2.69E-04	557	6.71E-04	624	6.76E-04	691	1.54E-04	758	1.81E-05
424	4.68E-05	491	2.74E-04	558	6.78E-04	625	6.69E-04	692	1.48E-04	759	1.79E-05
425	5.20E-05	492	2.84E-04	559	6.80E-04	626	6.62E-04	693	1.43E-04	760	1.74E-05
426	5.93E-05	493	2.93E-04	560	6.85E-04	627	6.54E-04	694	1.39E-04	761	1.67E-05
427	6.75E-05	494	3.05E-04	561	6.87E-04	628	6.47E-04	695	1.35E-04	762	1.60E-05
428	7.54E-05	495	3.16E-04	562	6.91E-04	629	6.38E-04	696	1.31E-04	763	1.56E-05
429	8.35E-05	496	3.30E-04	563	6.94E-04	630	6.29E-04	697	1.27E-04	764	1.53E-05
430	9.47E-05	497	3.38E-04	564	6.99E-04	631	6.19E-04	698	1.23E-04	765	1.46E-05
431	1.05E-04	498	3.53E-04	565	7.03E-04	632	6.12E-04	699	1.20E-04	766	1.40E-05
432	1.16E-04	499	3.65E-04	566	7.09E-04	633	6.02E-04	700	1.16E-04	767	1.38E-05
433	1.31E-04	500	3.75E-04	567	7.10E-04	634	5.94E-04	701	1.13E-04	768	1.34E-05
434	1.47E-04	501	3.90E-04	568	7.15E-04	635	5.85E-04	702	1.09E-04	769	1.28E-05
435	1.61E-04	502	4.02E-04	569	7.20E-04	636	5.75E-04	703	1.05E-04	770	1.25E-05
436	1.81E-04	503	4.10E-04	570	7.24E-04	637	5.67E-04	704	1.02E-04	771	1.22E-05
437	2.04E-04	504	4.25E-04	571	7.26E-04	638	5.57E-04	705	9.97E-05	772	1.17E-05
438	2.29E-04	505	4.34E-04	572	7.26E-04	639	5.46E-04	706	9.62E-05	773	1.13E-05
439	2.57E-04	506	4.46E-04	573	7.34E-04	640	5.39E-04	707	9.30E-05	774	1.12E-05
440	2.88E-04	507	4.57E-04	574	7.37E-04	641	5.25E-04	708	9.07E-05	775	1.08E-05
441	3.31E-04	508	4.66E-04	575	7.38E-04	642	5.16E-04	709	8.77E-05	776	1.03E-05
442	3.76E-04	509	4.76E-04	576	7.42E-04	643	5.08E-04	710	8.45E-05	777	1.02E-05
443	4.39E-04	510	4.83E-04	577	7.46E-04	644	5.01E-04	711	8.18E-05	778	9.70E-06
444	5.01E-04	511	4.93E-04	578	7.49E-04	645	4.89E-04	712	7.94E-05	779	9.70E-06
445	5.73E-04	512	5.00E-04	579	7.55E-04	646	4.80E-04	713	7.68E-05	780	9.70E-06
446	6.51E-04	513	5.10E-04	580	7.58E-04	647	4.70E-04	714	7.45E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	C-SWISH2X4@20W4000K	Sample ID	240119002-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	24.9	Humidity (%RH)	43.8

Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at $25 \pm 1^\circ\text{C}$, 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 ± 0.2 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 1.0° vertical intervals and 15° horizontal intervals.</p>

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.0	60	0.080	19.7	0.895
NON-WORST CASE	120.0	60	0.159	18.9	0.991

Test Result

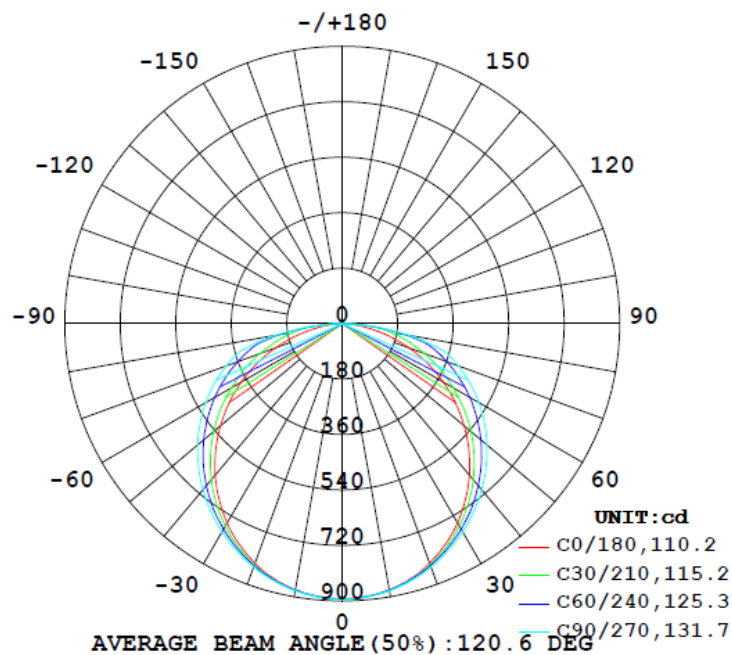
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement
	C0-180	C90-270	C0-180	C90-270		(0°-60°)
2810	160.7	169.8	110.1	131.7	142.6	74.1%

UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
16.8	19.9	1.26	1.32

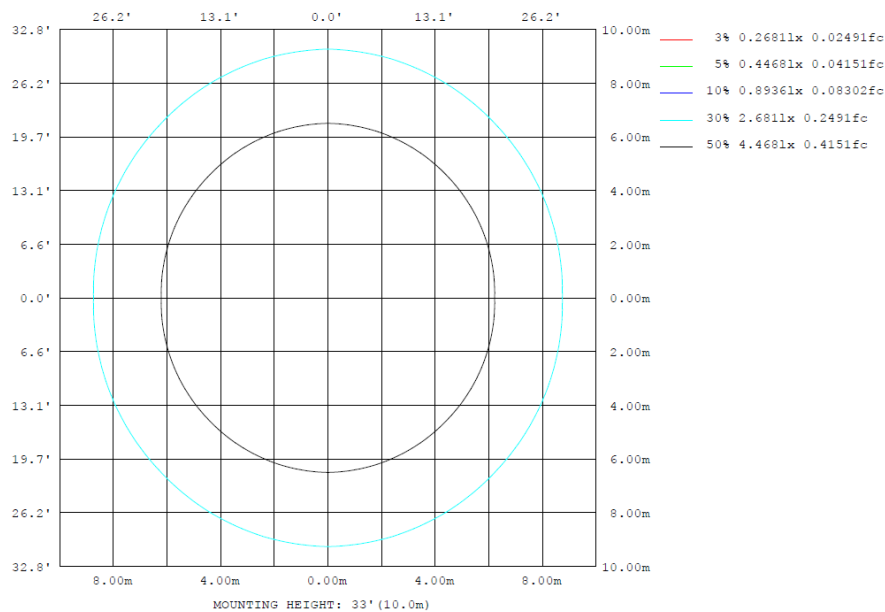
4.2 Goniophotometer Test

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	877.1	877.8	880.3	877.8	877.1	877.8	880.3	877.8	0- 10	84.58	84.58	3.01,3.01
20	828.4	834.1	840.3	834.1	828.4	834.1	840.3	834.1	10- 20	242.8	327.4	11.7,11.7
30	747.2	763.8	780.8	763.8	747.2	763.8	780.8	763.8	20- 30	369.9	697.3	24.8,24.8
40	641.9	672.4	702.8	672.4	641.9	672.4	702.8	672.4	30- 40	451.4	1149	40.9,40.9
50	516.3	564.6	612.5	564.6	516.3	564.6	612.5	564.6	40- 50	479.3	1628	57.9,57.9
60	377.0	446.5	510.6	446.5	377.0	446.5	510.6	446.5	50- 60	453.2	2081	74.1,74.1
70	229.5	324.4	401.2	324.4	229.5	324.4	401.2	324.4	60- 70	379.5	2461	87.6,87.6
80	87.13	192.0	218.3	192.0	87.13	192.0	218.3	192.0	70- 80	266.3	2727	97.97
90	0	0	0	0	0	0	0	0	80- 90	82.95	2810	100,100
100	0	0	0	0	0	0	0	0	90-100	0	2810	100,100
110	0	0	0	0	0	0	0	0	100-110	0	2810	100,100
120	0	0	0	0	0	0	0	0	110-120	0	2810	100,100
130	0	0	0	0	0	0	0	0	120-130	0	2810	100,100
140	0	0	0	0	0	0	0	0	130-140	0	2810	100,100
150	0	0	0	0	0	0	0	0	140-150	0	2810	100,100
160	0	0	0	0	0	0	0	0	150-160	0	2810	100,100
170	0	0	0	0	0	0	0	0	160-170	0	2810	100,100
180	0	0	0	0	0	0	0	0	170-180	0	2810	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	84.58	0-10	84.58	3.01%
10-20	242.82	0-20	327.40	11.65%
20-30	369.93	0-30	697.33	24.82%
30-40	451.42	0-40	1148.75	40.88%
40-50	479.28	0-50	1628.03	57.94%
50-60	453.23	0-60	2081.26	74.07%
60-70	379.53	0-70	2460.79	87.57%
70-80	266.27	0-80	2727.06	97.05%
80-90	82.95	0-90	2810.01	100.00%
90-100	0.00	0-100	2810.01	100.00%
100-110	0.00	0-110	2810.01	100.00%
110-120	0.00	0-120	2810.01	100.00%
120-130	0.00	0-130	2810.01	100.00%
130-140	0.00	0-140	2810.01	100.00%
140-150	0.00	0-150	2810.01	100.00%
150-160	0.00	0-160	2810.01	100.00%
160-170	0.00	0-170	2810.01	100.00%
170-180	0.00	0-180	2810.01	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	8.6	10.3	9.0	10.6	10.9	10.0	11.7	10.3	12.0	12.3
	3H	10.4	11.9	10.8	12.3	12.6	12.5	14.1	12.9	14.4	14.8
	4H	11.0	12.5	11.4	12.8	13.2	13.8	15.2	14.2	15.6	16.0
	6H	11.5	12.8	11.9	13.2	13.6	14.7	16.1	15.1	16.5	16.8
	8H	11.6	12.9	12.0	13.3	13.7	15.0	16.3	15.5	16.7	17.1
	12H	11.7	12.9	12.1	13.3	13.7	15.2	16.5	15.7	16.9	17.3
4H	2H	9.6	11.0	10.0	11.4	11.7	10.6	12.0	11.0	12.4	12.8
	3H	11.6	12.8	12.0	13.2	13.6	13.4	14.7	13.8	15.1	15.5
	4H	12.4	13.5	12.8	14.0	14.4	14.8	16.0	15.3	16.4	16.8
	6H	13.0	14.0	13.5	14.4	14.9	16.0	17.0	16.4	17.4	17.9
	8H	13.2	14.1	13.6	14.6	15.0	16.3	17.3	16.8	17.7	18.2
	12H	13.3	14.2	13.8	14.6	15.1	16.6	17.4	17.1	17.9	18.4
8H	4H	13.2	14.1	13.6	14.6	15.0	15.2	16.1	15.7	16.6	17.0
	6H	14.0	14.8	14.5	15.3	15.7	16.5	17.3	17.0	17.8	18.2
	8H	14.3	15.0	14.8	15.5	16.0	17.0	17.7	17.5	18.2	18.7
	12H	14.5	15.1	15.0	15.6	16.2	17.3	17.9	17.8	18.4	19.0
12H	4H	13.3	14.2	13.8	14.7	15.1	15.2	16.1	15.7	16.6	17.0
	6H	14.3	15.0	14.8	15.4	16.0	16.6	17.3	17.1	17.8	18.3
	8H	14.7	15.3	15.2	15.8	16.3	17.1	17.8	17.6	18.2	18.8

Maximum UGR = 19.0

UGR – Corrected Table:

UGR TABLE - CORRECTED

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	12.2	13.9	12.6	14.2	14.5	13.6	15.3	13.9	15.6	15.9
	3H	14.0	15.5	14.4	15.9	16.2	16.1	17.7	16.5	18.0	18.4
	4H	14.6	16.1	15.0	16.4	16.8	17.4	18.8	17.8	19.2	19.6
	6H	15.1	16.4	15.5	16.8	17.2	18.3	19.7	18.7	20.1	20.4
	8H	15.2	16.5	15.6	16.9	17.3	18.6	19.9	19.1	20.3	20.7
	12H	15.3	16.5	15.7	16.9	17.3	18.8	20.1	19.3	20.5	20.9
4H	2H	13.2	14.6	13.6	15.0	15.3	14.2	15.6	14.6	16.0	16.4
	3H	15.2	16.4	15.6	16.8	17.2	17.0	18.3	17.4	18.7	19.1
	4H	16.0	17.1	16.4	17.6	18.0	18.4	19.6	18.9	20.0	20.4
	6H	16.6	17.6	17.1	18.0	18.5	19.6	20.6	20.0	21.0	21.5
	8H	16.8	17.7	17.2	18.2	18.6	19.9	20.9	20.4	21.3	21.8
	12H	16.9	17.8	17.4	18.2	18.7	20.2	21.0	20.7	21.5	22.0
8H	4H	16.8	17.7	17.2	18.2	18.6	18.8	19.7	19.3	20.2	20.6
	6H	17.6	18.4	18.1	18.9	19.3	20.1	20.9	20.6	21.4	21.8
	8H	17.9	18.6	18.4	19.1	19.6	20.6	21.3	21.1	21.8	22.3
	12H	18.1	18.7	18.6	19.2	19.8	20.9	21.5	21.4	22.0	22.6
12H	4H	16.9	17.8	17.4	18.3	18.7	18.8	19.7	19.3	20.2	20.6
	6H	17.9	18.6	18.4	19.0	19.6	20.2	20.9	20.7	21.4	21.9
	8H	18.3	18.9	18.8	19.4	19.9	20.7	21.4	21.2	21.8	22.4

Maximum UGR = 22.6

4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	894	894	895	894	894	894	895	894	894	894	895	894	894	894	895	894	894	894	895
5	889	890	890	890	889	890	891	890	889	890	890	890	889	890	890	890	889	890	891
10	877	878	879	878	878	879	880	879	878	878	879	878	877	878	879	878	878	879	880
15	856	859	860	859	860	862	863	862	860	859	860	859	856	859	860	859	860	862	863
20	828	831	833	834	836	839	840	839	836	834	833	831	828	831	833	834	836	839	840
25	790	795	799	801	806	810	812	810	806	801	799	795	790	795	799	801	806	810	812
30	747	753	759	764	771	777	781	777	771	764	759	753	747	753	759	764	771	777	781
35	697	705	713	721	731	739	744	739	731	721	713	705	697	705	713	721	731	739	744
40	642	650	661	672	687	698	703	698	687	672	661	650	642	650	661	672	687	698	703
45	581	591	605	620	638	653	659	653	638	620	605	591	581	591	605	620	638	653	659
50	516	528	545	565	587	604	612	604	587	565	545	528	516	528	545	565	587	604	612
55	448	461	482	506	533	554	563	554	533	506	482	461	448	461	482	506	533	554	563
60	377	390	416	446	477	501	511	501	477	446	416	390	377	390	416	446	477	501	511
65	304	319	350	385	419	445	457	445	419	385	350	319	304	319	350	385	419	445	457
70	229	246	284	324	360	389	401	389	360	324	284	246	229	246	284	324	360	389	401
75	156	177	220	263	302	330	339	330	302	263	220	177	156	177	220	263	302	330	339
80	87.1	113	158	192	205	214	218	214	205	192	158	113	87.1	113	158	192	205	214	218
85	31.5	55.6	76.5	81.6	83.6	85.6	87.0	85.6	83.6	81.6	76.5	55.6	31.5	55.6	76.5	81.6	83.6	85.6	87.0
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) γ (DEG)	285	300	315	330	345														
0	894	894	894	895	894														
5	890	889	890	890	890														
10	879	878	878	879	878														
15	862	860	859	860	859														
20	839	836	834	833	831														
25	810	806	801	799	795														
30	777	771	764	759	753														
35	739	731	721	713	705														
40	698	687	672	661	650														
45	653	638	620	605	591														
50	604	587	565	545	528														
55	554	533	506	482	461														
60	501	477	446	416	390														
65	445	419	385	350	319														
70	389	360	324	284	246														
75	330	302	263	220	177														
80	214	205	192	158	113														
85	85.6	83.6	81.6	76.5	55.6														
90	0.00	0.00	0.00	0.00	0.00														
95	0.00	0.00	0.00	0.00	0.00														
100	0.00	0.00	0.00	0.00	0.00														
105	0.00	0.00	0.00	0.00	0.00														
110	0.00	0.00	0.00	0.00	0.00														
115	0.00	0.00	0.00	0.00	0.00														
120	0.00	0.00	0.00	0.00	0.00														
125	0.00	0.00	0.00	0.00	0.00														
130	0.00	0.00	0.00	0.00	0.00														
135	0.00	0.00	0.00	0.00	0.00														
140	0.00	0.00	0.00	0.00	0.00														
145	0.00	0.00	0.00	0.00	0.00														
150	0.00	0.00	0.00	0.00	0.00														
155	0.00	0.00	0.00	0.00	0.00														
160	0.00	0.00	0.00	0.00	0.00														
165	0.00	0.00	0.00	0.00	0.00														
170	0.00	0.00	0.00	0.00	0.00														
175	0.00	0.00	0.00	0.00	0.00														
180	0.00	0.00	0.00	0.00	0.00														

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	C-SWISH2X4@20W4000K	Sample ID	240119002-S1
Temperature (°C)	25.4	Humidity (%RH)	41.0

Test Method
<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 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	0.159	18.9	0.991	11.30
277.0	60	0.080	19.7	0.895	14.32

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*****