

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: 2023-11-15
Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		5982
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		149.2
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		5839
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	145.6
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		40.1
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.09
			277V	28.46
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.992
			277V	0.853
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5281
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		82.8
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		8
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		83
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	-18%≤IES Rcs,h1≤+23%		-13%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		2.8%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		120.0
(Goniophotometer – Section 4.2)		Non-Worst Case		277.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.337
(Goniophotometer – Section 4.2)		Non-Worst Case		0.168
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		40.1
(Goniophotometer – Section 4.2)		Non-Worst Case		39.8

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-11-02	WPX2 @ 40W / 5000K	231101003-S1
2	Goniophotometer Test	2023-11-02	WPX2 @ 40W / 5000K	231101003-S1
3	THD and PF Test	2023-11-02	WPX2 @ 40W / 5000K	231101003-S1

Remark (If any)

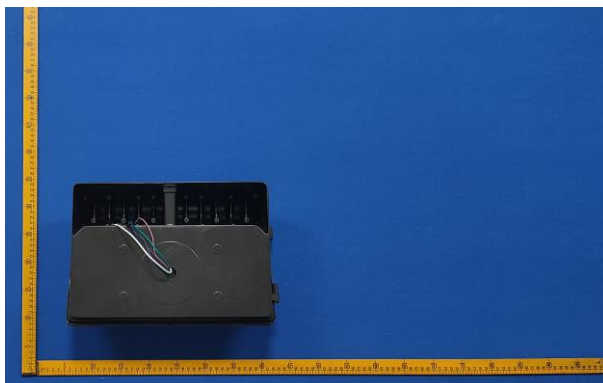
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. WPX2 @ 40W / 5000K, color tunable from 3000K, 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.	WPX2 @ 40W / 5000K	Sample ID	231101003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

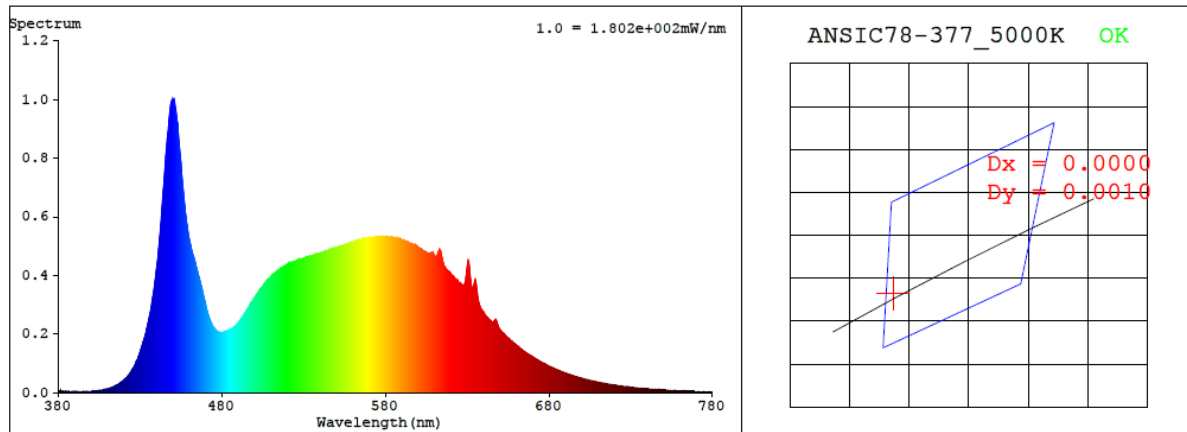
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.337	40.1	0.992
277.0	60	0.168	39.8	0.853

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5281	82.8	8	0.0005	83	96	-13%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3377$ $y = 0.3465$ / $u' = 0.2084$ $v' = 0.4811$ ($duv=4.88e-04$)

CCT= 5281K Prcp WL: Ld=566.0nm Purity=5.3%

Peak WL: Lp=451nm FWHM: =19.5nm Ratio:R=15.3% G=80.1% B=4.6%

Render Index: Ra = 82.8 AvgR = 75.9 TM30:Rf=83 Rg=96

EEL: 0.09225 A++ Highest

R1 =81	R2 =87	R3 =91	R4 =83	R5 =82	R6 =83	R7 =87
R8 =68	R9 =8	R10=70	R11=83	R12=61	R13=83	R14=95 R15=77

4.1 Integrating Sphere Test

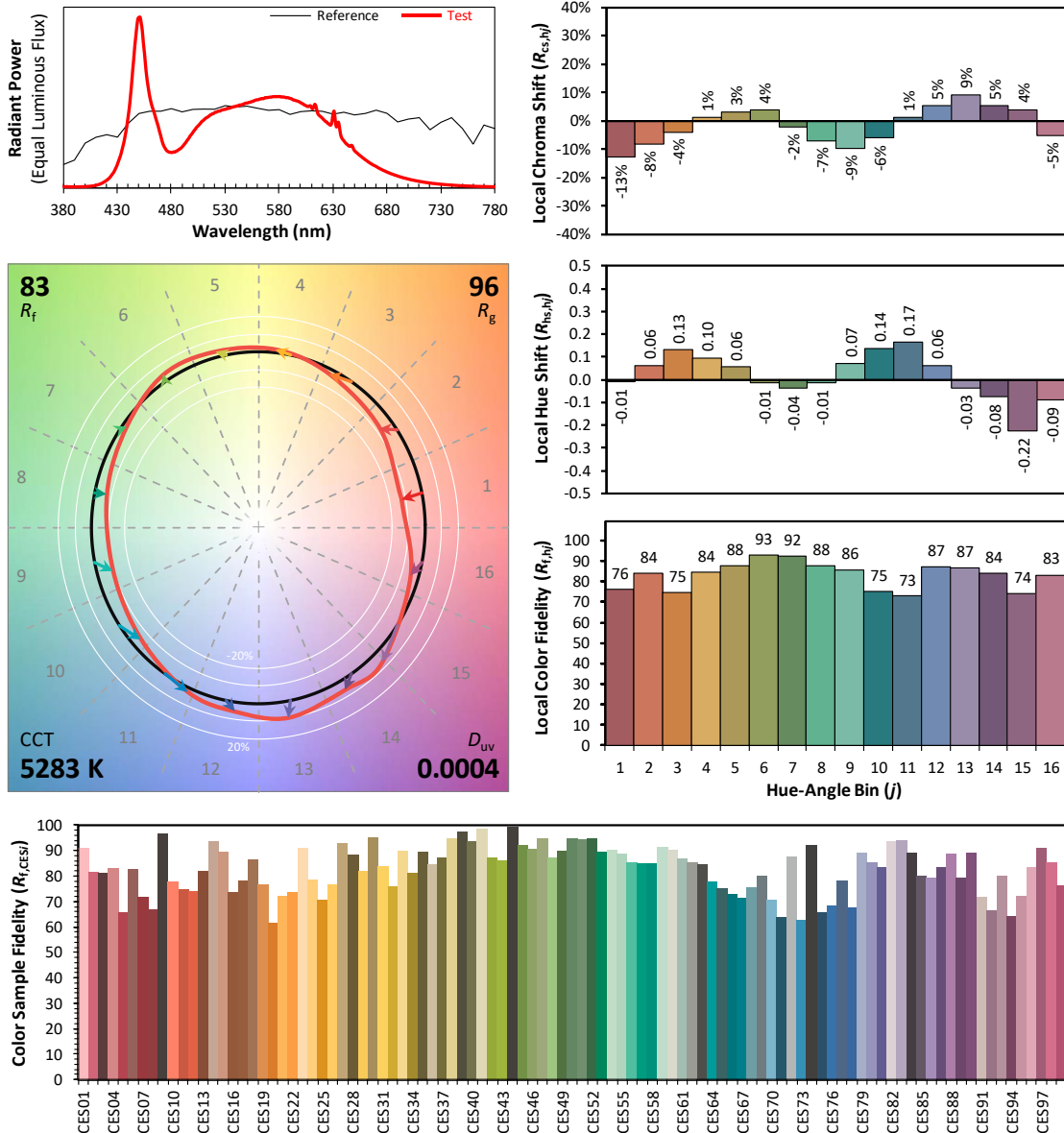
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/11/15

Model: WPX2 @ 40W / 5000K



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

x 0.3376
 y 0.3463
 u' 0.2084
 v' 0.4810

CIE 13.3-1995
(CRI)

R_a 83
 R_g 8

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

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	6.10E-06	447	8.86E-04	514	4.13E-04	581	5.32E-04	648	2.41E-04	715	3.03E-05
381	4.60E-06	448	9.46E-04	515	4.19E-04	582	5.29E-04	649	2.25E-04	716	2.94E-05
382	3.30E-06	449	9.88E-04	516	4.24E-04	583	5.30E-04	650	2.15E-04	717	2.84E-05
383	5.10E-06	450	9.96E-04	517	4.27E-04	584	5.29E-04	651	2.09E-04	718	2.78E-05
384	4.10E-06	451	9.96E-04	518	4.31E-04	585	5.29E-04	652	2.03E-04	719	2.67E-05
385	3.80E-06	452	9.62E-04	519	4.32E-04	586	5.26E-04	653	1.98E-04	720	2.61E-05
386	4.10E-06	453	9.20E-04	520	4.37E-04	587	5.26E-04	654	1.92E-04	721	2.53E-05
387	3.40E-06	454	8.45E-04	521	4.41E-04	588	5.26E-04	655	1.87E-04	722	2.40E-05
388	3.80E-06	455	7.88E-04	522	4.41E-04	589	5.24E-04	656	1.82E-04	723	2.35E-05
389	3.30E-06	456	7.15E-04	523	4.45E-04	590	5.21E-04	657	1.76E-04	724	2.29E-05
390	4.30E-06	457	6.54E-04	524	4.47E-04	591	5.20E-04	658	1.72E-04	725	2.22E-05
391	3.50E-06	458	6.06E-04	525	4.47E-04	592	5.17E-04	659	1.67E-04	726	2.14E-05
392	3.50E-06	459	5.65E-04	526	4.51E-04	593	5.12E-04	660	1.62E-04	727	2.07E-05
393	3.60E-06	460	5.29E-04	527	4.54E-04	594	5.12E-04	661	1.58E-04	728	2.01E-05
394	3.80E-06	461	5.01E-04	528	4.55E-04	595	5.09E-04	662	1.53E-04	729	1.95E-05
395	4.00E-06	462	4.76E-04	529	4.57E-04	596	5.08E-04	663	1.49E-04	730	1.88E-05
396	4.00E-06	463	4.57E-04	530	4.58E-04	597	5.06E-04	664	1.44E-04	731	1.83E-05
397	4.40E-06	464	4.39E-04	531	4.59E-04	598	5.04E-04	665	1.40E-04	732	1.77E-05
398	4.40E-06	465	4.16E-04	532	4.64E-04	599	5.00E-04	666	1.36E-04	733	1.72E-05
399	4.50E-06	466	3.95E-04	533	4.63E-04	600	4.96E-04	667	1.32E-04	734	1.65E-05
400	4.90E-06	467	3.74E-04	534	4.64E-04	601	4.93E-04	668	1.29E-04	735	1.59E-05
401	5.90E-06	468	3.52E-04	535	4.67E-04	602	4.89E-04	669	1.26E-04	736	1.56E-05
402	6.00E-06	469	3.27E-04	536	4.69E-04	603	4.85E-04	670	1.23E-04	737	1.50E-05
403	6.30E-06	470	3.05E-04	537	4.71E-04	604	4.81E-04	671	1.19E-04	738	1.46E-05
404	6.90E-06	471	2.80E-04	538	4.73E-04	605	4.78E-04	672	1.15E-04	739	1.41E-05
405	7.50E-06	472	2.58E-04	539	4.74E-04	606	4.75E-04	673	1.12E-04	740	1.37E-05
406	8.00E-06	473	2.43E-04	540	4.76E-04	607	4.73E-04	674	1.08E-04	741	1.32E-05
407	9.10E-06	474	2.31E-04	541	4.78E-04	608	4.78E-04	675	1.05E-04	742	1.27E-05
408	1.03E-05	475	2.21E-04	542	4.78E-04	609	4.78E-04	676	1.02E-04	743	1.23E-05
409	1.09E-05	476	2.14E-04	543	4.82E-04	610	4.68E-04	677	9.88E-05	744	1.21E-05
410	1.30E-05	477	2.10E-04	544	4.83E-04	611	4.60E-04	678	9.68E-05	745	1.17E-05
411	1.45E-05	478	2.07E-04	545	4.84E-04	612	4.71E-04	679	9.31E-05	746	1.12E-05
412	1.61E-05	479	2.06E-04	546	4.86E-04	613	4.87E-04	680	9.03E-05	747	1.09E-05
413	1.80E-05	480	2.05E-04	547	4.88E-04	614	4.78E-04	681	8.77E-05	748	1.06E-05
414	2.06E-05	481	2.05E-04	548	4.91E-04	615	4.51E-04	682	8.54E-05	749	1.01E-05
415	2.36E-05	482	2.08E-04	549	4.94E-04	616	4.31E-04	683	8.23E-05	750	9.70E-06
416	2.60E-05	483	2.07E-04	550	4.94E-04	617	4.23E-04	684	8.01E-05	751	9.50E-06
417	3.00E-05	484	2.11E-04	551	4.95E-04	618	4.17E-04	685	7.79E-05	752	9.40E-06
418	3.38E-05	485	2.13E-04	552	4.98E-04	619	4.12E-04	686	7.56E-05	753	9.00E-06
419	3.80E-05	486	2.18E-04	553	4.99E-04	620	4.06E-04	687	7.32E-05	754	8.50E-06
420	4.21E-05	487	2.22E-04	554	5.01E-04	621	3.99E-04	688	7.10E-05	755	8.30E-06
421	4.75E-05	488	2.26E-04	555	5.04E-04	622	3.93E-04	689	6.94E-05	756	8.20E-06
422	5.27E-05	489	2.31E-04	556	5.05E-04	623	3.86E-04	690	6.68E-05	757	8.00E-06
423	5.94E-05	490	2.37E-04	557	5.09E-04	624	3.84E-04	691	6.48E-05	758	7.70E-06
424	6.75E-05	491	2.45E-04	558	5.11E-04	625	3.76E-04	692	6.29E-05	759	7.50E-06
425	7.64E-05	492	2.53E-04	559	5.13E-04	626	3.73E-04	693	6.08E-05	760	7.30E-06
426	8.46E-05	493	2.61E-04	560	5.13E-04	627	3.66E-04	694	5.90E-05	761	7.10E-06
427	9.50E-05	494	2.70E-04	561	5.15E-04	628	3.66E-04	695	5.68E-05	762	6.80E-06
428	1.08E-04	495	2.79E-04	562	5.18E-04	629	3.84E-04	696	5.53E-05	763	6.40E-06
429	1.22E-04	496	2.87E-04	563	5.19E-04	630	4.31E-04	697	5.39E-05	764	6.20E-06
430	1.37E-04	497	2.97E-04	564	5.21E-04	631	4.46E-04	698	5.23E-05	765	6.20E-06
431	1.55E-04	498	3.06E-04	565	5.20E-04	632	3.95E-04	699	5.04E-05	766	6.00E-06
432	1.73E-04	499	3.14E-04	566	5.22E-04	633	3.56E-04	700	4.90E-05	767	5.70E-06
433	1.91E-04	500	3.23E-04	567	5.26E-04	634	3.65E-04	701	4.75E-05	768	5.60E-06
434	2.16E-04	501	3.32E-04	568	5.25E-04	635	3.82E-04	702	4.55E-05	769	5.50E-06
435	2.41E-04	502	3.40E-04	569	5.26E-04	636	3.49E-04	703	4.47E-05	770	5.30E-06
436	2.66E-04	503	3.49E-04	570	5.27E-04	637	3.11E-04	704	4.31E-05	771	5.20E-06
437	3.00E-04	504	3.56E-04	571	5.29E-04	638	2.91E-04	705	4.19E-05	772	4.80E-06
438	3.34E-04	505	3.62E-04	572	5.29E-04	639	2.81E-04	706	4.06E-05	773	4.80E-06
439	3.75E-04	506	3.69E-04	573	5.30E-04	640	2.74E-04	707	3.92E-05	774	4.80E-06
440	4.21E-04	507	3.76E-04	574	5.31E-04	641	2.65E-04	708	3.82E-05	775	4.30E-06
441	4.69E-04	508	3.85E-04	575	5.31E-04	642	2.58E-04	709	3.69E-05	776	4.50E-06
442	5.33E-04	509	3.90E-04	576	5.32E-04	643	2.52E-04	710	3.56E-05	777	4.30E-06
443	6.00E-04	510	3.95E-04	577	5.31E-04	644	2.47E-04	711	3.45E-05	778	4.20E-06
444	6.79E-04	511	4.01E-04	578	5.32E-04	645	2.42E-04	712	3.34E-05	779	4.00E-06
445	7.49E-04	512	4.06E-04	579	5.32E-04	646	2.41E-04	713	3.23E-05	780	4.00E-06
446	8.24E-04	513	4.10E-04	580	5.32E-04	647	2.47E-04	714	3.17E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	WPX2 @ 40W / 5000K	Sample ID	231101003-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	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 25±1°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	120.0	60	0.337	40.1	0.992
NON-WORST CASE	277.0	60	0.168	39.8	0.853

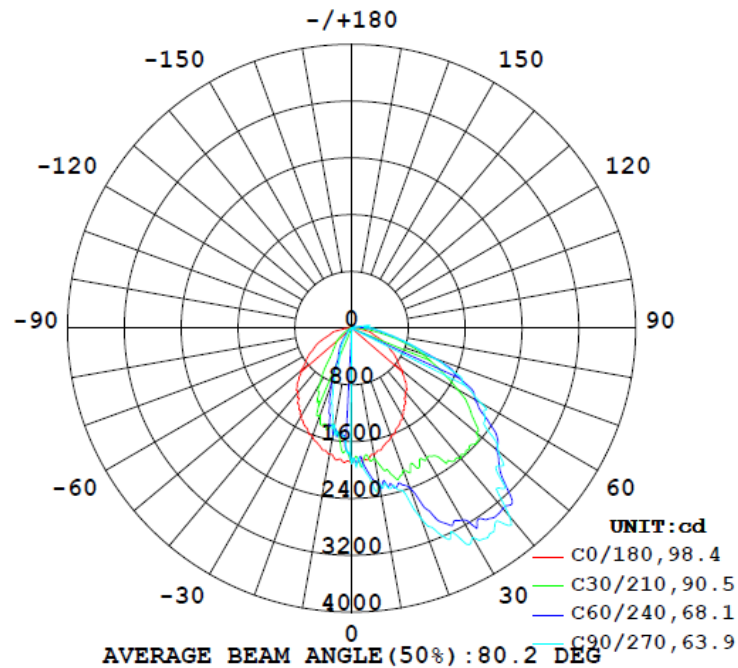
Test Result

Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement (80°-90°)	BUG
		C0-180	C90-270	C0-180	C90-270			
0°-180° zones	5982	113.5	147.8	65.3	98.3	149.2	2.7%	B1-U3-G2
0°-90° zones	5839	113.5	147.8	65.3	98.3	145.6	2.8%	B1-U3-G2

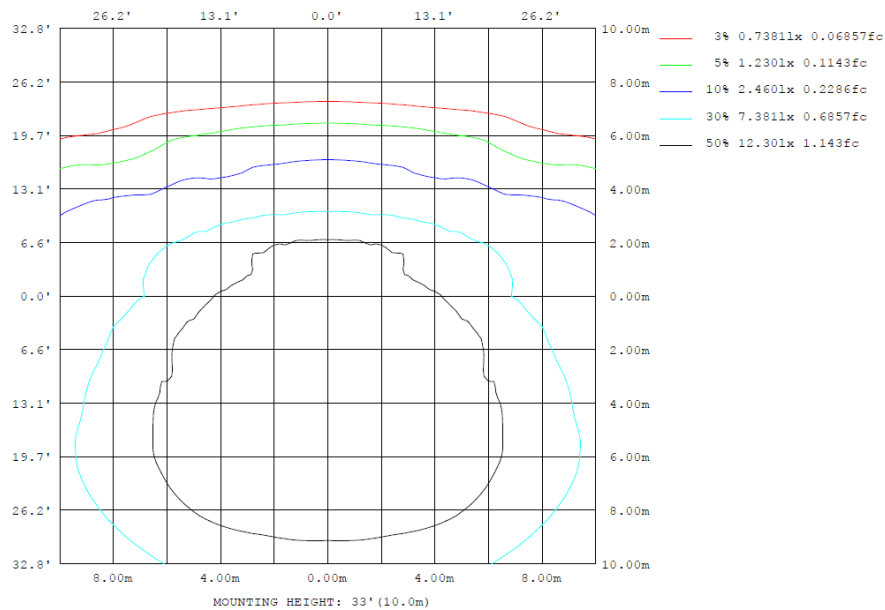
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

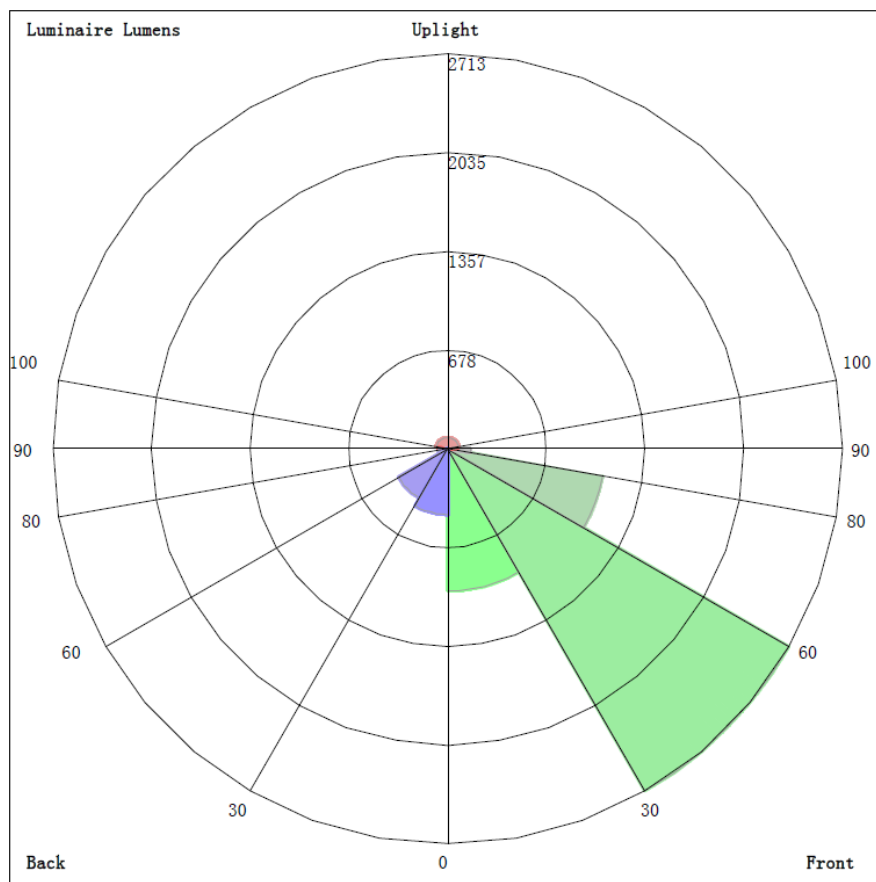
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	1803	2133	2213	2133	1803	1553	1379	1553	0- 10	169.8	169.8	2.84,2.84
20	1622	2262	2836	2262	1622	1058	566.1	1058	10- 20	486.1	655.9	11,11
30	1415	2801	3404	2801	1415	434.7	279.8	434.7	20- 30	771.8	1428	23.9,23.9
40	1186	2941	3454	2941	1186	257.1	84.85	257.1	30- 40	1020	2448	40.9,40.9
50	932.1	2626	2695	2626	932.1	105.0	48.61	105.0	40- 50	1100	3548	59.3,59.3
60	650.6	1956	2096	1956	650.6	47.74	17.45	47.74	50- 60	982.6	4530	75.7,75.7
70	400.1	1269	1213	1269	400.1	6.025	0.9436	6.025	60- 70	745.9	5276	88.2,88.2
80	218.3	528.4	562.7	528.4	218.3	2.439	1.298	2.439	70- 80	401.9	5678	94.9,94.9
90	20.40	158.3	271.5	158.3	20.40	1.589	1.478	1.589	80- 90	160.8	5839	97.6,97.6
100	16.90	64.98	255.1	64.98	16.90	2.035	1.868	2.035	90-100	64.80	5904	98.7,98.7
110	13.50	15.33	46.36	15.33	13.50	1.620	2.052	1.620	100-110	28.24	5932	99.2,99.2
120	8.097	46.17	21.34	46.17	8.097	1.564	1.987	1.564	110-120	14.01	5946	99.4,99.4
130	4.516	38.82	47.17	38.82	4.516	1.664	2.301	1.664	120-130	15.88	5962	99.7,99.7
140	1.427	24.30	38.49	24.30	1.427	1.827	2.392	1.827	130-140	11.33	5973	99.9,99.9
150	1.108	12.00	20.27	12.00	1.108	2.041	2.379	2.041	140-150	5.797	5979	100,100
160	1.133	0.9498	7.901	0.9498	1.133	2.152	2.098	2.152	150-160	2.031	5981	100,100
170	1.322	1.251	1.361	1.251	1.322	1.747	1.628	1.747	160-170	0.5369	5982	100,100
180	1.604	1.552	1.311	1.552	1.604	1.477	1.394	1.477	170-180	0.1435	5982	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	169.83	0-10	169.83	2.84%
10-20	486.07	0-20	655.90	10.97%
20-30	771.76	0-30	1427.66	23.87%
30-40	1020.28	0-40	2447.94	40.92%
40-50	1099.92	0-50	3547.86	59.31%
50-60	982.60	0-60	4530.46	75.74%
60-70	745.89	0-70	5276.35	88.21%
70-80	401.92	0-80	5678.27	94.93%
80-90	160.85	0-90	5839.12	97.62%
90-100	64.80	0-100	5903.92	98.70%
100-110	28.24	0-110	5932.16	99.17%
110-120	14.01	0-120	5946.17	99.41%
120-130	15.88	0-130	5962.05	99.67%
130-140	11.33	0-140	5973.38	99.86%
140-150	5.80	0-150	5979.18	99.96%
150-160	2.03	0-160	5981.21	99.99%
160-170	0.54	0-170	5981.75	100.00%
170-180	0.14	0-180	5981.89	100.00%

4.2 Goniophotometer Test

LCS/BUG

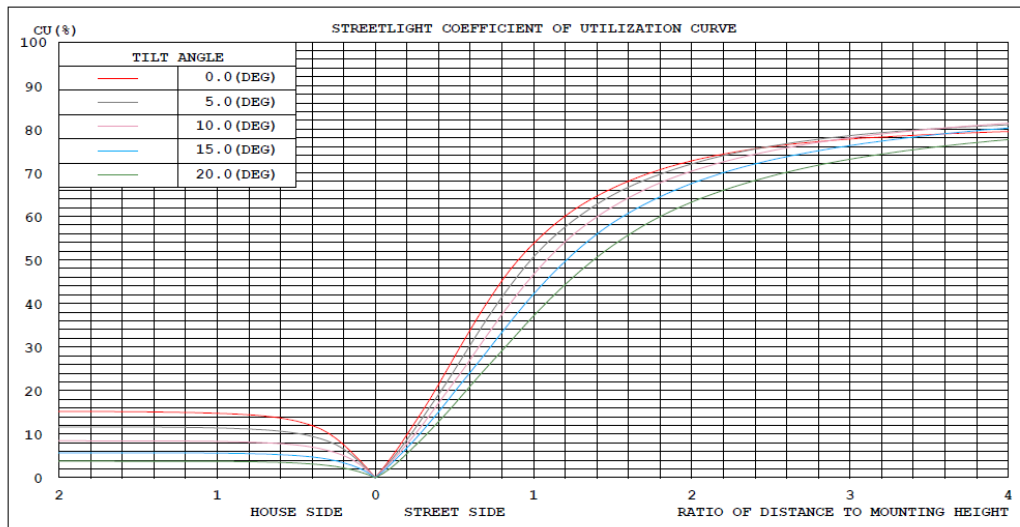


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

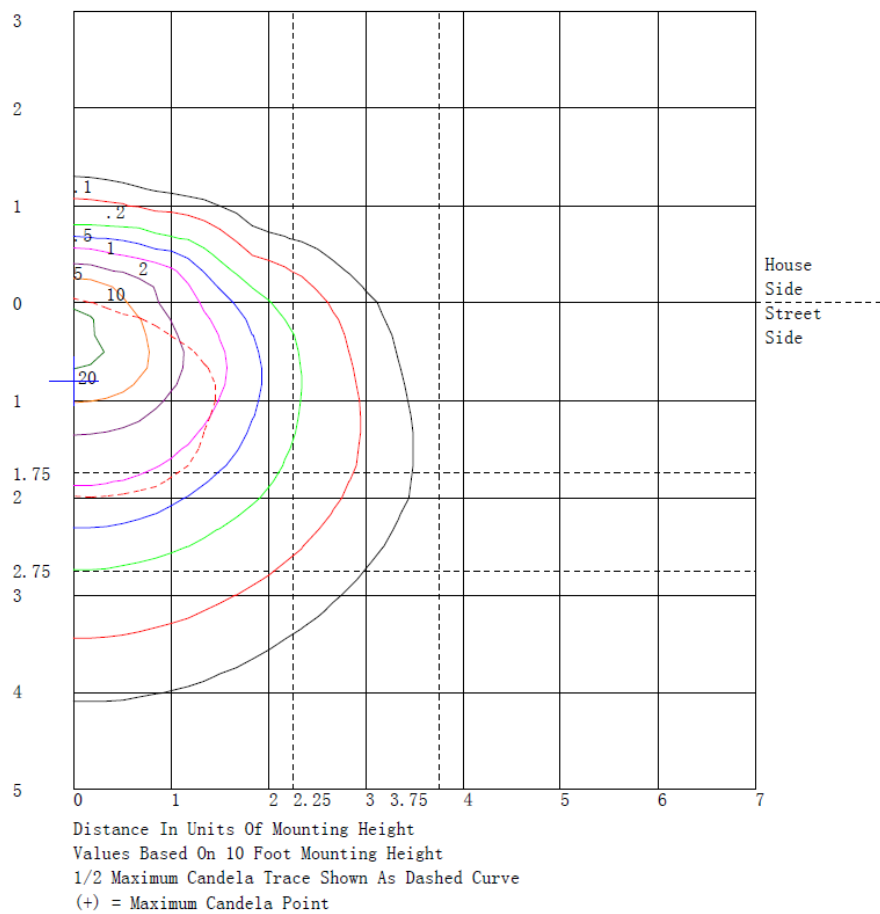
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	977.5	N.A.	16.3
FM - Front-Medium (30-60)	2713.4	N.A.	45.4
FH - Front-High (60-80)	1081.2	N.A.	18.1
FVH - Front-Very High (80-90)	153.4	N.A.	2.6
BL - Back-Low (0-30)	450.1	N.A.	7.5
BM - Back-Medium (30-60)	389.4	N.A.	6.5
BH - Back-High (60-80)	66.6	N.A.	1.1
BVH - Back-Very High (80-90)	7.5	N.A.	0.1
UL - Uplight-Low (90-100)	64.8	N.A.	1.1
UH - Uplight-High (100-180)	78.0	N.A.	1.3
Total	5981.9	N.A.	100.0
BUG Rating	B1-U3-G2		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG) y (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	1897	1898	1898	1899	1900	1900	1901	1901	1902	1902	1903	1904	1905	1905	1905	1905	1905	1906	1907
5	1849	1823	1810	1810	1837	1869	1893	1878	1857	1841	1864	1894	1921	1915	1906	1901	1934	1969	1993
10	1803	1815	1827	1838	1834	1839	1861	1941	2036	2133	2207	2266	2305	2300	2279	2251	2235	2222	2213
15	1719	1707	1727	1778	1888	2010	2125	2178	2214	2239	2277	2309	2331	2329	2318	2304	2301	2298	2294
20	1622	1661	1718	1793	1905	2022	2130	2187	2228	2262	2296	2338	2396	2509	2628	2737	2796	2829	2836
25	1537	1651	1761	1869	1977	2079	2172	2224	2284	2374	2585	2811	3016	3096	3139	3161	3215	3259	3283
30	1415	1616	1783	1916	1976	2032	2113	2330	2570	2801	2935	3040	3124	3215	3292	3353	3384	3400	3404
35	1312	1508	1693	1867	2023	2175	2326	2496	2667	2837	3006	3161	3294	3381	3441	3479	3498	3502	3494
40	1186	1378	1574	1773	1980	2188	2391	2587	2772	2941	3083	3207	3314	3417	3496	3547	3531	3495	3454
45	1077	1262	1457	1664	1892	2123	2347	2559	2745	2895	2966	3001	3015	3042	3056	3054	3011	2963	2925
50	932	1091	1277	1490	1764	2040	2290	2445	2555	2626	2655	2663	2664	2694	2722	2743	2732	2714	2695
55	780	952	1140	1344	1591	1833	2048	2177	2266	2325	2372	2397	2399	2363	2317	2273	2272	2279	2287
60	651	841	1027	1207	1394	1568	1719	1824	1902	1956	1978	1991	2004	2059	2113	2156	2144	2120	2096
65	542	710	865	1009	1139	1258	1364	1465	1551	1618	1653	1672	1680	1686	1688	1690	1703	1715	1723
70	400	499	603	711	832	950	1060	1149	1220	1269	1277	1269	1255	1256	1257	1256	1241	1225	1213
75	305	340	391	456	552	650	738	804	814	814	811	808	821	837	851	853	851	848	
80	218	220	235	263	312	368	424	468	503	528	535	535	532	538	545	552	557	561	563
85	91.7	86.5	92.0	108	141	180	221	252	279	305	329	350	367	377	384	389	392	394	395
90	20.4	29.8	41.0	54.0	69.5	86.4	104	122	140	158	180	201	221	236	249	259	266	270	271
95	15.8	21.3	27.2	33.5	40.0	47.0	54.9	63.3	73.1	84.5	99.6	116	132	149	164	176	185	190	191
100	16.9	17.4	18.4	20.1	21.3	23.9	28.7	37.0	48.9	65.0	88.3	115	143	173	202	226	242	252	255
105	12.7	13.0	13.4	13.8	13.6	14.0	15.4	20.1	25.6	31.1	33.0	35.4	39.7	52.0	65.4	77.8	84.6	88.2	88.6
110	13.5	9.51	8.46	10.3	18.5	27.1	33.6	27.9	20.8	15.3	22.3	31.5	40.7	42.6	42.8	42.3	43.8	45.3	46.4
115	11.9	7.56	6.31	8.16	15.6	24.2	32.4	36.2	37.4	35.8	27.7	19.0	12.4	16.1	22.6	29.9	34.7	37.9	39.0
120	8.10	4.64	4.14	6.58	13.8	22.6	31.6	37.7	42.6	46.2	48.8	49.6	48.2	41.5	33.7	26.3	22.7	21.0	21.3
125	6.09	3.19	2.94	5.32	11.8	19.8	28.3	35.1	41.2	46.2	49.7	52.0	53.2	52.5	51.1	49.2	47.4	45.9	45.1
130	4.52	2.48	2.52	4.62	9.88	16.4	23.4	29.0	34.1	38.8	43.2	46.7	49.4	50.1	50.0	49.3	48.5	47.6	47.2
135	1.49	0.00	0.00	0.69	5.80	12.1	18.8	23.5	27.8	31.8	36.3	40.3	43.5	44.6	45.0	44.8	44.8	44.4	44.5
140	1.43	2.58	4.10	5.98	8.25	10.9	13.8	17.2	20.8	24.3	27.7	30.7	33.4	35.1	36.3	37.1	37.9	38.4	38.5
145	1.40	1.65	2.33	3.45	5.08	7.09	9.40	12.1	14.9	17.6	19.8	21.8	23.5	25.1	26.4	27.6	28.7	29.5	29.9
150	1.11	1.13	1.14	1.16	0.64	0.51	1.19	4.46	8.28	12.0	13.9	15.2	16.1	17.1	18.0	18.7	19.4	20.0	20.3
155	1.03	1.02	1.06	1.15	1.08	1.21	1.69	3.17	4.94	6.79	8.25	9.54	10.6	11.3	11.9	12.3	12.8	13.1	13.3
160	1.13	1.07	1.06	1.09	1.23	1.36	1.45	1.11	0.88	0.95	2.07	3.47	4.93	5.94	6.77	7.40	7.73	7.88	7.90
165	1.22	1.23	1.23	1.22	1.18	1.15	1.16	1.29	1.45	1.64	1.91	2.12	2.20	1.86	1.44	1.04	0.95	0.96	1.01
170	1.32	1.33	1.33	1.33	1.32	1.31	1.30	1.28	1.27	1.25	1.23	1.22	1.22	1.24	1.26	1.29	1.31	1.33	1.36
175	1.42	1.43	1.44	1.44	1.44	1.44	1.43	1.42	1.41	1.40	1.38	1.37	1.35	1.33	1.31	1.29	1.26	1.24	1.23
180	1.60	1.61	1.62	1.62	1.61	1.60	1.59	1.58	1.57	1.55	1.52	1.49	1.46	1.43	1.41	1.39	1.36	1.33	1.31

UNIT: cd																			
C (DEG) y (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	1906	1905	1905	1905	1905	1905	1904	1903	1902	1902	1901	1901	1900	1900	1899	1898	1898	1897	1902
5	1969	1934	1901	1906	1915	1921	1894	1864	1841	1857	1878	1893	1868	1837	1810	1810	1823	1849	1784
10	2222	2235	2251	2279	2300	2305	2266	2207	2133	2036	1941	1861	1839	1834	1838	1827	1815	1803	1737
15	2298	2301	2304	2318	2329	2331	2309	2277	2239	2214	2178	2125	2010	1888	1778	1727	1707	1719	1577
20	2829	2796	2737	2628	2509	2396	2338	2296	2262	2228	2187	2130	2022	1905	1793	1718	1661	1622	1503
25	3259	3215	3161	3139	3096	3016	2811	2585	2374	2284	2224	2172	2079	1977	1869	1761	1651	1537	1470
30	3400	3384	3353	3292	3215	3124	3040	2935	2801	2570	2330	2113	2032	1976	1916	1783	1616	1415	1410
35	3502	3498	3479	3441	3381	3294	3161	3006	2837	2667	2496	2326	2175	2023	1867	1693	1508	1312	1327
40	3495	3531	3547	3496	3417	3314	3207	3083	2941	2772	2587	2391	2188	1980	1773	1574	1378	1186	1174
45	2963	3011	3054	3056	3042	3015	3001	2966	2895	2745	2559	2347	2123	1892	1664	1457	1262	1076	1028
50	2714	2732	2743	2722	2694	2664	2663	2655	2626	2555	2445	2290	2040	1764	1490	1277	1091	932	836
55	2279	2272	2273	2317	2363	2399	2397	2372	2325	2266	2177	2048	1833	1591	1344	1140	952	780	640
60	2120	2144	2156	2113	2059	2004	1991	1978	1956	1902	1824	1719	1568	1394	1207	1027	841	651	490
65	1715	1703	1690	1688	1686	1680	1672	1653	1618	1551	1465	1364	1258	1139	1009	865	710	542	394
70	1225	1241	1256	1257	1256	1255	1269	1277	1269	1220	1149	1060	950	832	711	603	499	400	301
75	851	853	851	837	821	808	811	814	814	804	780	738	650	552	456	391	340	305	218
80	561	557	552	545	538	532	535	535	528	503	468	424	368	312	263	235	220	218	148
85	394	392	389	384	377	367	350	329	305	279	252	221	180	141	108	92.0	86.5	81.7	64.9
90	270	266	259	249	236	221	201	180	158	140	122	104	86.4	69.5	54.0	41.0	29.8	20.4	18.5
95	190	185	176	164	149	132	116	99.6	84.5	73.1	63.3	54.9	47.0	40.0	33.5	27.2	21.3	15.8	13.8
100	252	242	226	202	173	143	115	88.3	65.0	48.9	37.0	28.7	23.9	21.3	20.1	18.4	17.4	16.9	13.4
105	88.2	84.6	77.8	65.4	52.0	39.7	35.4	33.0	31.1	25.6	20.1	15.4	14.0	13.6	13.8	13.4	13.0	12.7	9.75
110	45.3	43.8	42.3	42.8	42.6	40.7	31.5	22.3	15.3	20.8	27.9	33.6	27.1	18.5	10.3	8.46	9.51	13.5	9.56
115	37.9	34.7	29.9	22.6	16.1	12.4	19.0	27.7	35.8	37.4	36.2	32.4	24.2	15.6	8.16	6.31	7.56	11.9	8.51
120	21.0	22.7	26.3	33.7	41.5	48.2	49.6	48.8	46.2	42.6	37.7	31.6	22.6	13.8	6.58	4.14	4.64	8.10	6.20
125	45.9	47.4	49.2	51.1	52.5	53.2	52.0	49.7	46.2	41.2	35.1	28.3	19.8	11.8	5.32	2.94	3.19	6.09	4.83
130	47.6	48.5	49.3	50.0	50.1	49.4	46.7	43.2	38.8	34.1	29.0	23.4	16.4	9.88	4.62	2.52	2.48	4.52	3.69
135	44.6	44.8	44.8	45.0	44.6	43.5	40.3	36.3	31.8	27.8	23.5	18.8	12.1	5.80	0.69	0.00	0.00	1.49	1.86
140	38.4	37.9	37.1	36.3	35.1	33.4	30.7	27.7	24.3	20.8	17.2	13.8	10.0	8.25	5.98	4.10	2.58	1.43	1.66
145	29.5	28.7	27.6	26.4	25.1	23.5	21.8	19.8	17.6	14.9	12.1	9.40	7.09	5.08	3.45	2.33	1.65	1.40	1.58
150	20.1	19.4	18.7	18.0	17.1	16.1	15.2	13.9	12.0	8.28	4.46	1.19	0.51	0.64	1.16	1.14	1.13	1.11	1.42
155	13.1	12.8	12.3	11.9	11.3	10.6	9.54	8.25	6.79	4.94	3.17	1.69	1.21	0.68	1.15	1.06	1.02	1.01	1.47
160	7.88	7.73	7.40	6.77	5.94	4.93	3.47	2.07	0.95	0.88	1.11	1.45	1.36	1.23	1.09	1.06	1.07	1.13	1.63
165	0.96	0.95	1.04	1.44	1.86	2.20	2.12	1.91	1.64	1.45	1.29	1.16	1.15	1.18	1.22	1.23	1.23	1.22	1.70
170	1.33	1.31	1.29	1.26	1.24	1.22	1.22	1.23	1.25	1.27	1.28	1.30	1.31	1.32	1.33	1.33	1.33	1.32	1.65
175	1.24	1.26	1.29	1.31	1.33	1.35	1.37	1.38	1.40	1.41	1.42	1.43	1.44	1.44	1.44	1.44	1.43	1.42	1.67
180	1.33	1.36	1.39	1.41	1.43	1.46	1.49	1.52	1.55	1.57	1.58	1.59	1.60	1.61	1.62	1.62	1.61	1.60	1.67

Table--3

UNIT: °C

Y	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	1906	1909	1910	1910	1909	1908	1907	1907	1907	1908	1908	1908	1907	1906	1906	1907	1907	1907	1906
5	1736	1704	1705	1711	1709	1656	1596	1540	1523	1518	1521	1522	1525	1527	1526	1523	1520	1523	1526
10	1676	1618	1554	1502	1468	1487	1520	1553	1556	1546	1523	1478	1429	1386	1375	1374	1379	1374	1375
15	1471	1402	1385	1393	1411	1417	1416	1403	1357	1301	1241	1184	1134	1095	1089	1093	1101	1093	1089
20	1410	1344	1327	1319	1305	1233	1147	1058	991	927	863	788	716	652	608	579	566	579	608
25	1404	1340	1288	1230	1154	1026	885	744	627	527	450	417	403	401	393	389	388	389	393
30	1371	1298	1179	1036	880	715	562	435	384	361	354	332	313	298	288	282	280	282	288
35	1288	1197	1013	807	607	493	410	350	305	271	246	218	194	175	165	159	158	159	165
40	1115	1009	814	604	411	330	284	257	212	173	140	118	102	92.3	86.6	84.4	84.8	84.4	86.6
45	949	839	668	489	326	247	197	166	131	105	86.5	78.0	74.8	74.6	72.0	70.4	69.8	70.4	72.0
50	734	625	496	370	258	188	138	105	84.2	72.7	67.1	59.9	54.8	51.4	49.4	48.5	48.6	48.5	49.4
55	516	409	319	245	185	138	102	75.5	58.7	48.5	43.2	39.2	37.3	36.7	35.7	35.1	34.9	35.1	35.7
60	358	255	190	147	118	88.2	64.9	47.7	37.0	30.4	26.6	23.1	20.8	19.5	18.3	17.6	17.6	18.3	18.3
65	274	181	126	91.5	71.3	50.9	36.1	25.6	16.1	9.07	4.26	1.74	0.67	0.54	0.36	0.47	0.73	0.47	0.36
70	218	151	103	67.9	43.3	25.0	13.0	6.03	1.95	0.45	0.53	0.21	0.31	0.63	0.73	0.84	0.94	0.84	0.73
75	146	91.1	56.6	34.7	21.9	11.8	6.17	3.53	1.48	0.67	0.65	0.47	0.52	0.71	0.84	0.99	1.13	0.99	0.84
80	92.0	50.4	28.1	16.5	11.8	6.49	3.63	2.44	1.34	0.87	0.81	0.69	0.71	0.82	0.97	1.14	1.30	1.14	0.97
85	43.2	26.6	16.7	10.7	7.48	4.52	2.72	1.78	1.17	0.95	0.97	0.90	0.90	0.97	1.09	1.24	1.38	1.24	1.09
90	16.4	14.0	10.9	7.88	5.15	3.48	2.32	1.59	1.23	1.11	1.15	1.11	1.12	1.17	1.26	1.36	1.48	1.36	1.26
95	11.8	9.81	7.72	5.78	4.10	2.96	2.14	1.61	1.37	1.30	1.33	1.31	1.32	1.36	1.42	1.50	1.60	1.50	1.42
100	10.4	7.86	5.97	4.54	3.49	2.77	2.30	2.04	1.86	1.79	1.77	1.71	1.68	1.67	1.71	1.77	1.87	1.77	1.71
105	7.22	5.12	3.44	2.21	1.43	1.38	1.62	1.97	2.00	1.99	1.96	1.93	1.91	1.90	1.94	2.00	2.08	2.00	1.94
110	6.45	4.17	3.02	2.47	2.28	1.94	1.72	1.62	1.67	1.78	1.91	1.95	1.98	1.99	2.01	2.03	2.05	2.03	2.01
115	5.78	3.76	2.69	2.15	1.95	1.72	1.62	1.61	1.63	1.69	1.76	1.78	1.80	1.82	1.85	1.88	1.91	1.88	1.85
120	4.64	3.41	2.57	2.02	1.69	1.53	1.51	1.56	1.62	1.70	1.78	1.82	1.85	1.88	1.92	1.96	1.99	1.96	1.92
125	3.77	2.93	2.31	1.88	1.62	1.51	1.52	1.59	1.67	1.77	1.87	1.91	1.95	1.98	2.03	2.08	2.11	2.08	2.03
130	3.00	2.44	2.02	1.73	1.55	1.52	1.57	1.66	1.73	1.80	1.88	1.97	2.05	2.13	2.20	2.26	2.30	2.26	2.20
135	2.09	2.18	2.02	1.79	1.57	1.58	1.64	1.74	1.83	1.91	2.00	2.07	2.13	2.19	2.25	2.29	2.32	2.29	2.25
140	1.85	1.93	1.87	1.77	1.67	1.70	1.75	1.83	1.88	1.95	2.01	2.08	2.15	2.22	2.29	2.35	2.39	2.35	2.29
145	1.73	1.82	1.84	1.83	1.82	1.84	1.88	1.93	2.00	2.07	2.13	2.18	2.21	2.25	2.32	2.38	2.42	2.38	2.32
150	1.65	1.82	1.89	1.92	1.92	1.96	2.00	2.04	2.08	2.11	2.15	2.17	2.20	2.23	2.28	2.34	2.38	2.34	2.28
155	1.81	2.05	2.14	2.15	2.12	2.10	2.08	2.06	2.07	2.09	2.12	2.16	2.20	2.24	2.24	2.23	2.22	2.23	2.24
160	2.00	2.24	2.33	2.32	2.26	2.23	2.19	2.15	2.15	2.15	2.15	2.12	2.09	2.06	2.07	2.08	2.10	2.08	2.07
165	2.06	2.29	2.34	2.31	2.23	2.18	2.14	2.09	2.07	2.05	2.03	1.96	1.89	1.84	1.85	1.88	1.90	1.88	1.85
170	1.96	2.12	2.14	2.08	1.99	1.90	1.82	1.75	1.72	1.70	1.69	1.67	1.65	1.63	1.63	1.63	1.63	1.63	1.63
175	1.85	1.95	1.97	1.94	1.87	1.77	1.66	1.58	1.56	1.57	1.58	1.53	1.49	1.45	1.46	1.48	1.51	1.48	1.46
180	1.60	1.59	1.58	1.58	1.56	1.54	1.51	1.48	1.44	1.41	1.38	1.35	1.34	1.33	1.35	1.37	1.39	1.37	1.35

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	1906	1907	1908	1908	1908	1907	1907	1907	1908	1909	1910	1910	1909	1906	1902				
5	1527	1525	1522	1521	1518	1523	1540	1596	1656	1709	1711	1705	1704	1736	1784				
10	1386	1429	1478	1523	1546	1556	1553	1520	1487	1468	1502	1554	1618	1676	1737				
15	1095	1134	1184	1241	1301	1357	1403	1416	1417	1411	1393	1385	1402	1471	1577				
20	652	716	788	863	927	991	1058	1147	1233	1305	1319	1327	1344	1410	1503				
25	401	403	417	450	527	627	744	885	1026	1154	1230	1288	1340	1404	1470				
30	298	313	332	354	361	384	435	562	715	880	1036	1179	1298	1371	1410				
35	175	194	218	246	271	305	350	410	493	607	807	1013	1197	1288	1327				
40	92.3	102	118	140	173	212	257	284	330	411	604	814	1009	1115	1174				
45	74.6	74.8	78.0	86.5	105	131	166	197	247	326	489	668	839	949	1028				
50	51.4	54.8	59.9	67.1	72.7	84.2	105	138	188	258	370	496	625	734	836				
55	36.7	37.3	39.2	43.2	48.5	58.7	75.5	102	138	185	245	319	409	516	640				
60	19.5	20.8	23.1	26.6	30.4	37.0	47.7	64.9	88.2	118	147	190	255	358	490				
65	0.54	0.67	1.74	4.26	9.07	16.1	25.6	36.1	50.9	71.3	91.5	126	181	274	394				
70	0.63	0.31	0.21	0.53	0.45	1.95	6.03	13.0	25.0	43.3	67.9	103	151	218	301				
75	0.71	0.52	0.47	0.65	0.67	1.48	3.53	6.17	11.8	21.9	34.7	56.6	91.1	146	218				
80	0.82	0.71	0.69	0.81	0.87	1.34	2.44	3.63	6.49	11.8	16.5	28.1	50.4	92.0	148				
85	0.97	0.90	0.90	0.97	0.95	1.17	1.78	2.72	4.52	7.48	10.7	16.7	26.6	43.2	64.9				
90	1.17	1.12	1.11	1.15	1.11	1.23	1.59	2.32	3.48	5.15	7.88	10.9	14.0	16.4	18.5				
95	1.36	1.32	1.31	1.33	1.30	1.37	1.61	2.14	2.96	4.10	5.78	7.72	9.81	11.8	13.8				
100	1.67	1.68	1.71	1.77	1.79	1.86	2.04	2.30	2.77	3.49	4.54	5.97	7.86	10.4	13.4				
105	1.90	1.91	1.93	1.96	1.99	2.00	1.97	1.62	1.38	1.43	2.21	3.44	5.12	7.22	9.75				
110	1.99	1.98	1.95	1.91	1.78	1.67	1.62	1.72	1.94	2.28	2.47	3.02	4.17	6.45	9.56				
115	1.82	1.80	1.78	1.76	1.69	1.63	1.61	1.62	1.72	1.95	2.15	2.69	3.76	5.78	8.51				
120	1.88	1.85	1.82	1.78	1.70	1.62	1.56	1.51	1.53	1.69	2.02	2.57	3.41	4.64	6.20				
125	1.98	1.95	1.91	1.87	1.77	1.67	1.59	1.52	1.51	1.62	1.88	2.31	2.93	3.77	4.83				
130	2.13	2.05	1.97	1.88	1.80	1.73	1.66	1.57	1.52	1.55	1.73	2.02	2.44	3.00	3.69				
135	2.19	2.13	2.07	2.00	1.91	1.83	1.74	1.64	1.58	1.57	1.79	2.02	2.18	2.09	1.86				
140	2.22	2.15	2.08	2.01	1.95	1.88	1.83	1.75	1.70	1.67	1.77	1.87	1.93	1.85	1.68				
145	2.25	2.21	2.18	2.13	2.07	2.00	1.93	1.88	1.84	1.82	1.83	1.84	1.82	1.73	1.58				
150	2.23	2.20	2.17	2.15	2.11	2.08	2.04	2.00	1.96	1.92	1.92	1.89	1.82	1.65	1.42				
155	2.24	2.20	2.16	2.12	2.09	2.07	2.06	2.08	2.10	2.12	2.15	2.14	2.05	1.81	1.47				
160	2.06	2.09	2.12	2.15	2.15	2.15	2.15	2.19	2.23	2.26	2.32	2.33	2.24	2.00	1.63				
165	1.84	1.89	1.96	2.03	2.05	2.07	2.09	2.14	2.18	2.23	2.31	2.34	2.29	2.06	1.70				
170	1.63	1.65	1.67	1.69	1.70	1.72	1.75	1.82	1.90	1.99	2.08	2.14	2.12	1.96	1.69				
175	1.45	1.49	1.53	1.58	1.57	1.56	1.58	1.66	1.77	1.87	1.94	1.97	1.95	1.85	1.67				
180	1.33	1.34	1.35	1.38	1.41	1.44	1.48	1.51	1.54	1.56	1.58	1.58	1.59	1.60	1.60				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	WPX2 @ 40W / 5000K	Sample ID	231101003-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 $25 \pm 1^{\circ}\text{C}$. 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	0.337	40.1	0.992	2.09
277.0	60	0.168	39.8	0.853	28.46

5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2022-11-09	2023-11-08
NTC-F01-006	2.0 meter Integrating Sphere	2022-11-09	2023-11-08
NTC-F01-012	Standard Lamp	2022-11-09	2023-11-08
NTC-F01-013	Standard Lamp	2022-11-09	2023-11-08
NTC-F01-031	Digital Power Meter	2023-08-25	2024-08-24
NTC-F01-019	Temperature & Humidity Meter	2022-11-12	2023-11-11

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