

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		5789
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		144.7
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		5646
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	141.2
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		40.0
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	1.95
			277V	28.70
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.992
			277V	0.851
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3045±175	3105
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		82.5
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		10
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		95
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-12%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		2.7%
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		0.336
(Goniophotometer – Section 4.2)		Non-Worst Case		0.167
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		40.0
(Goniophotometer – Section 4.2)		Non-Worst Case		39.4

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-11-02	WPX2 @ 40W / 3000K	231101003-S1
2	Goniophotometer Test	2023-11-02	WPX2 @ 40W / 3000K	231101003-S1
3	THD and PF Test	2023-11-02	WPX2 @ 40W / 3000K	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 / 3000K, 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 / 3000K	Sample ID	231101003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

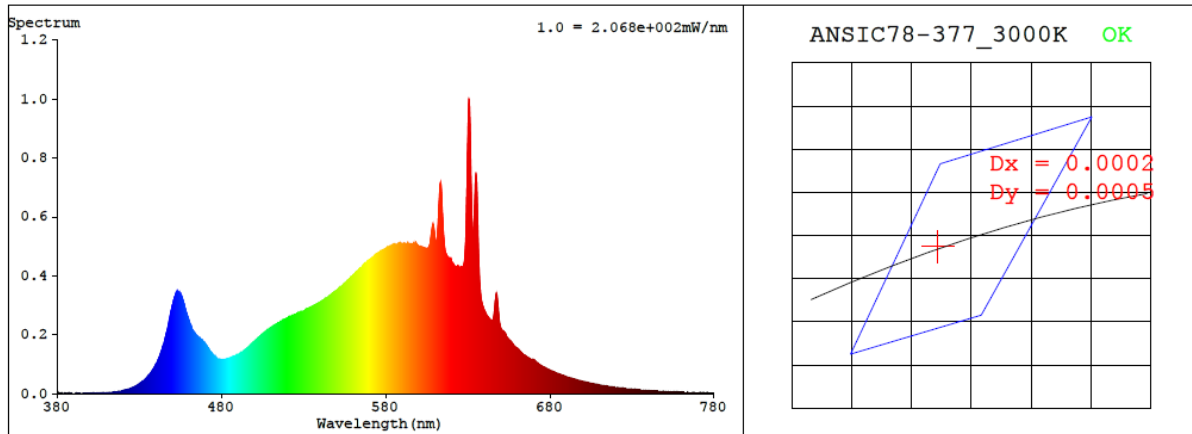
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.336	40.0	0.992
277.0	60	0.167	39.4	0.851

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3105	82.5	10	0.0002	84	95	-12%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4299$ $y = 0.4020$ / $u' = 0.2469$ $v' = 0.5195$ ($duv=1.80e-04$)

CCT= 3105K Prcp WL: $L_d=582.3nm$ Purity=49.7%

Peak WL: $L_p=631nm$ FWHM: $=8.3nm$ Ratio: $R=22.3\%$ $G=75.0\%$ $B=2.8\%$

Render Index: $R_a = 82.5$ $AvgR = 76.5$ $TM30:R_f=83$ $R_g=95$

EEL: 0.09480 A++ Highest

R1 =81	R2 =91	R3 =96	R4 =79	R5 =80	R6 =88	R7 =83
R8 =61	R9 =10	R10=78	R11=77	R12=67	R13=83	R14=99 R15=74

4.1 Integrating Sphere Test

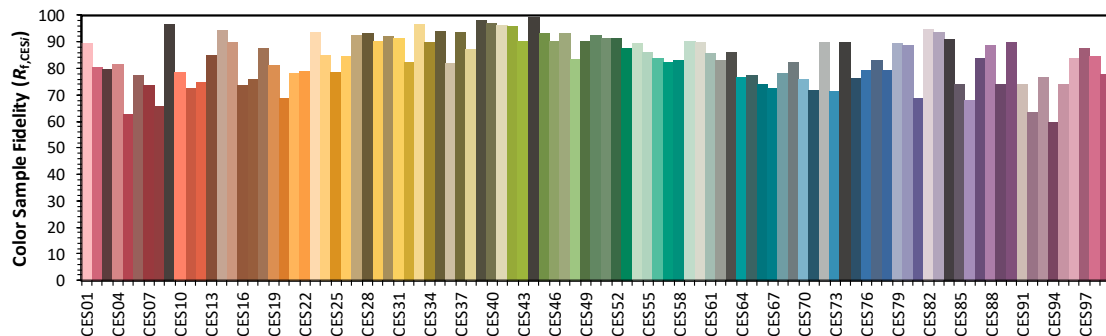
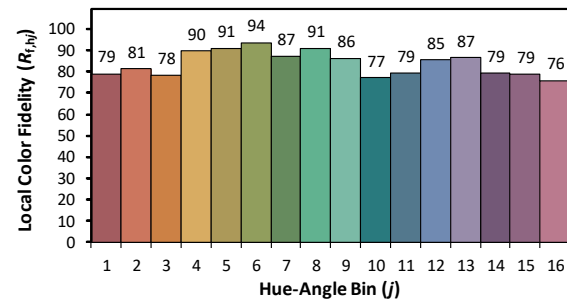
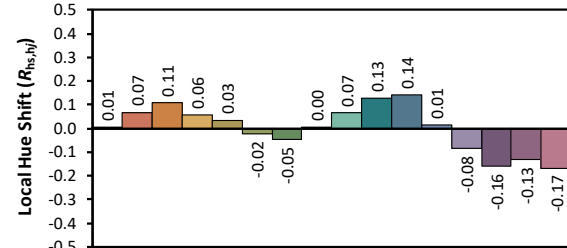
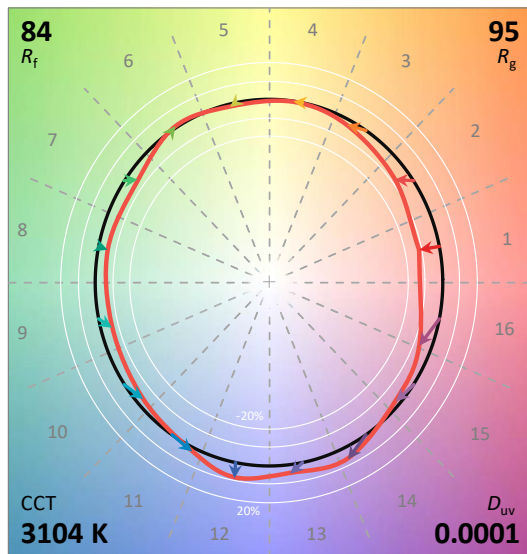
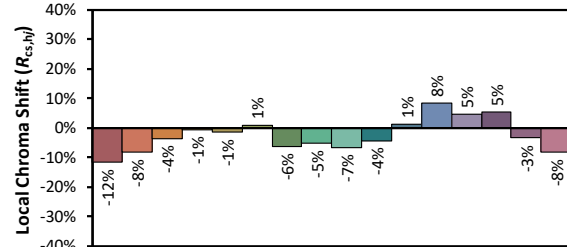
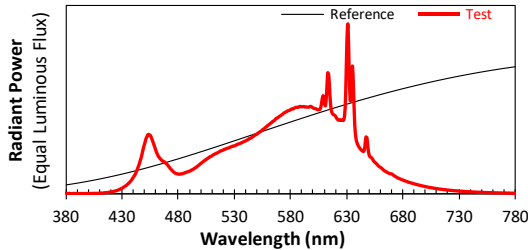
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/11/15

Model: WPX2 @ 40W / 3000K



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

x 0.4299

y 0.4019

u' 0.2470

v' 0.5195

CIE 13.3-1995
(CRI)

R_a 82

R_g 10

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	3.40E-06	447	2.17E-04	514	2.38E-04	581	4.97E-04	648	3.24E-04	715	2.57E-05
381	0.00E+00	448	2.47E-04	515	2.41E-04	582	4.96E-04	649	2.60E-04	716	2.46E-05
382	2.10E-06	449	2.74E-04	516	2.44E-04	583	5.01E-04	650	2.25E-04	717	2.39E-05
383	1.80E-06	450	2.97E-04	517	2.49E-04	584	5.04E-04	651	2.14E-04	718	2.33E-05
384	4.00E-07	451	3.21E-04	518	2.51E-04	585	5.06E-04	652	2.11E-04	719	2.21E-05
385	1.10E-06	452	3.36E-04	519	2.53E-04	586	5.06E-04	653	2.02E-04	720	2.15E-05
386	6.00E-07	453	3.47E-04	520	2.57E-04	587	5.07E-04	654	1.90E-04	721	2.11E-05
387	2.40E-06	454	3.45E-04	521	2.60E-04	588	5.11E-04	655	1.84E-04	722	2.02E-05
388	1.00E-06	455	3.41E-04	522	2.62E-04	589	5.10E-04	656	1.78E-04	723	1.96E-05
389	5.00E-07	456	3.25E-04	523	2.65E-04	590	5.09E-04	657	1.72E-04	724	1.92E-05
390	0.00E+00	457	3.08E-04	524	2.67E-04	591	5.10E-04	658	1.64E-04	725	1.84E-05
391	9.00E-07	458	2.89E-04	525	2.68E-04	592	5.10E-04	659	1.59E-04	726	1.78E-05
392	8.00E-07	459	2.70E-04	526	2.73E-04	593	5.08E-04	660	1.55E-04	727	1.71E-05
393	8.00E-07	460	2.51E-04	527	2.75E-04	594	5.08E-04	661	1.50E-04	728	1.67E-05
394	1.20E-06	461	2.34E-04	528	2.77E-04	595	5.07E-04	662	1.43E-04	729	1.62E-05
395	6.00E-07	462	2.20E-04	529	2.80E-04	596	5.07E-04	663	1.37E-04	730	1.54E-05
396	8.00E-07	463	2.11E-04	530	2.80E-04	597	5.10E-04	664	1.33E-04	731	1.49E-05
397	1.10E-06	464	2.04E-04	531	2.84E-04	598	5.11E-04	665	1.29E-04	732	1.48E-05
398	1.00E-06	465	1.96E-04	532	2.88E-04	599	5.07E-04	666	1.25E-04	733	1.42E-05
399	1.40E-06	466	1.91E-04	533	2.90E-04	600	5.02E-04	667	1.22E-04	734	1.37E-05
400	8.00E-07	467	1.88E-04	534	2.93E-04	601	5.00E-04	668	1.19E-04	735	1.32E-05
401	1.30E-06	468	1.83E-04	535	2.95E-04	602	4.98E-04	669	1.17E-04	736	1.25E-05
402	1.60E-06	469	1.76E-04	536	2.98E-04	603	4.95E-04	670	1.16E-04	737	1.25E-05
403	1.60E-06	470	1.71E-04	537	3.01E-04	604	4.92E-04	671	1.11E-04	738	1.20E-05
404	2.10E-06	471	1.62E-04	538	3.05E-04	605	4.92E-04	672	1.06E-04	739	1.18E-05
405	2.40E-06	472	1.54E-04	539	3.07E-04	606	4.95E-04	673	1.02E-04	740	1.11E-05
406	2.20E-06	473	1.45E-04	540	3.10E-04	607	5.11E-04	674	9.78E-05	741	1.08E-05
407	2.40E-06	474	1.39E-04	541	3.14E-04	608	5.53E-04	675	9.40E-05	742	1.04E-05
408	2.30E-06	475	1.32E-04	542	3.17E-04	609	5.73E-04	676	9.06E-05	743	1.02E-05
409	3.10E-06	476	1.26E-04	543	3.23E-04	610	5.34E-04	677	8.85E-05	744	9.90E-06
410	3.30E-06	477	1.21E-04	544	3.24E-04	611	5.17E-04	678	8.52E-05	745	9.60E-06
411	3.80E-06	478	1.17E-04	545	3.28E-04	612	5.94E-04	679	8.27E-05	746	9.10E-06
412	4.10E-06	479	1.17E-04	546	3.33E-04	613	7.07E-04	680	8.02E-05	747	8.90E-06
413	4.70E-06	480	1.15E-04	547	3.37E-04	614	6.85E-04	681	7.72E-05	748	8.60E-06
414	5.40E-06	481	1.14E-04	548	3.43E-04	615	5.68E-04	682	7.51E-05	749	8.50E-06
415	6.40E-06	482	1.16E-04	549	3.46E-04	616	4.95E-04	683	7.28E-05	750	8.20E-06
416	6.60E-06	483	1.16E-04	550	3.50E-04	617	4.71E-04	684	7.00E-05	751	8.00E-06
417	7.60E-06	484	1.19E-04	551	3.55E-04	618	4.63E-04	685	6.78E-05	752	7.60E-06
418	8.70E-06	485	1.21E-04	552	3.60E-04	619	4.60E-04	686	6.62E-05	753	7.30E-06
419	9.20E-06	486	1.24E-04	553	3.64E-04	620	4.53E-04	687	6.35E-05	754	6.90E-06
420	1.06E-05	487	1.26E-04	554	3.69E-04	621	4.41E-04	688	6.20E-05	755	6.90E-06
421	1.20E-05	488	1.28E-04	555	3.75E-04	622	4.33E-04	689	6.02E-05	756	6.60E-06
422	1.34E-05	489	1.30E-04	556	3.79E-04	623	4.30E-04	690	5.77E-05	757	6.50E-06
423	1.51E-05	490	1.33E-04	557	3.85E-04	624	4.34E-04	691	5.61E-05	758	6.30E-06
424	1.70E-05	491	1.36E-04	558	3.90E-04	625	4.29E-04	692	5.48E-05	759	6.10E-06
425	1.86E-05	492	1.40E-04	559	3.97E-04	626	4.31E-04	693	5.30E-05	760	6.00E-06
426	2.15E-05	493	1.43E-04	560	4.02E-04	627	4.30E-04	694	5.08E-05	761	5.80E-06
427	2.33E-05	494	1.48E-04	561	4.06E-04	628	4.58E-04	695	4.95E-05	762	5.50E-06
428	2.71E-05	495	1.52E-04	562	4.13E-04	629	5.89E-04	696	4.77E-05	763	5.50E-06
429	3.05E-05	496	1.56E-04	563	4.17E-04	630	8.78E-04	697	4.61E-05	764	5.30E-06
430	3.31E-05	497	1.62E-04	564	4.24E-04	631	9.92E-04	698	4.49E-05	765	5.00E-06
431	3.79E-05	498	1.67E-04	565	4.27E-04	632	7.42E-04	699	4.34E-05	766	4.90E-06
432	4.22E-05	499	1.72E-04	566	4.33E-04	633	5.47E-04	700	4.16E-05	767	4.70E-06
433	4.66E-05	500	1.78E-04	567	4.41E-04	634	6.23E-04	701	4.08E-05	768	4.60E-06
434	5.16E-05	501	1.83E-04	568	4.43E-04	635	7.47E-04	702	3.92E-05	769	4.30E-06
435	5.80E-05	502	1.88E-04	569	4.49E-04	636	5.99E-04	703	3.75E-05	770	4.50E-06
436	6.38E-05	503	1.93E-04	570	4.53E-04	637	4.11E-04	704	3.63E-05	771	4.30E-06
437	7.11E-05	504	1.98E-04	571	4.57E-04	638	3.30E-04	705	3.56E-05	772	4.10E-06
438	7.89E-05	505	2.02E-04	572	4.62E-04	639	3.00E-04	706	3.44E-05	773	3.90E-06
439	8.83E-05	506	2.07E-04	573	4.66E-04	640	2.84E-04	707	3.34E-05	774	4.00E-06
440	9.88E-05	507	2.11E-04	574	4.73E-04	641	2.72E-04	708	3.23E-05	775	3.60E-06
441	1.08E-04	508	2.17E-04	575	4.76E-04	642	2.63E-04	709	3.09E-05	776	3.60E-06
442	1.22E-04	509	2.18E-04	576	4.80E-04	643	2.55E-04	710	3.00E-05	777	3.30E-06
443	1.38E-04	510	2.23E-04	577	4.84E-04	644	2.50E-04	711	2.90E-05	778	3.50E-06
444	1.56E-04	511	2.28E-04	578	4.87E-04	645	2.49E-04	712	2.80E-05	779	3.30E-06
445	1.73E-04	512	2.31E-04	579	4.88E-04	646	2.73E-04	713	2.72E-05	780	3.30E-06
446	1.95E-04	513	2.35E-04	580	4.93E-04	647	3.32E-04	714	2.66E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	WPX2 @ 40W / 3000K	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 $25 \pm 1^\circ\text{C}$, 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	120.0	60	0.336	40.0	0.992
NON-WORST CASE	277.0	60	0.167	39.4	0.851

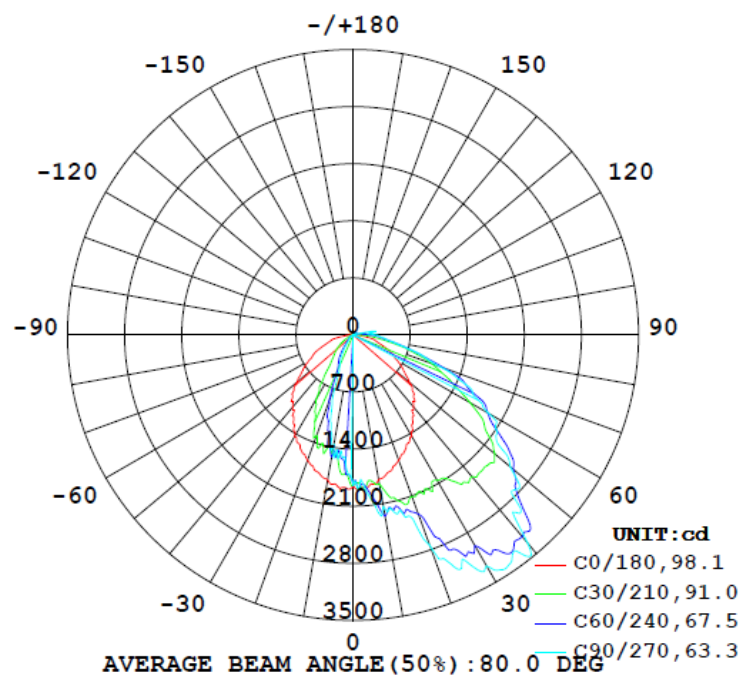
Test Result

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	5789	112.7	147.4	64.2	97.6	144.7	2.6%	B1-U3-G2
0°-90° zones	5646	112.7	147.4	64.2	97.6	141.2	2.7%	B1-U3-G2

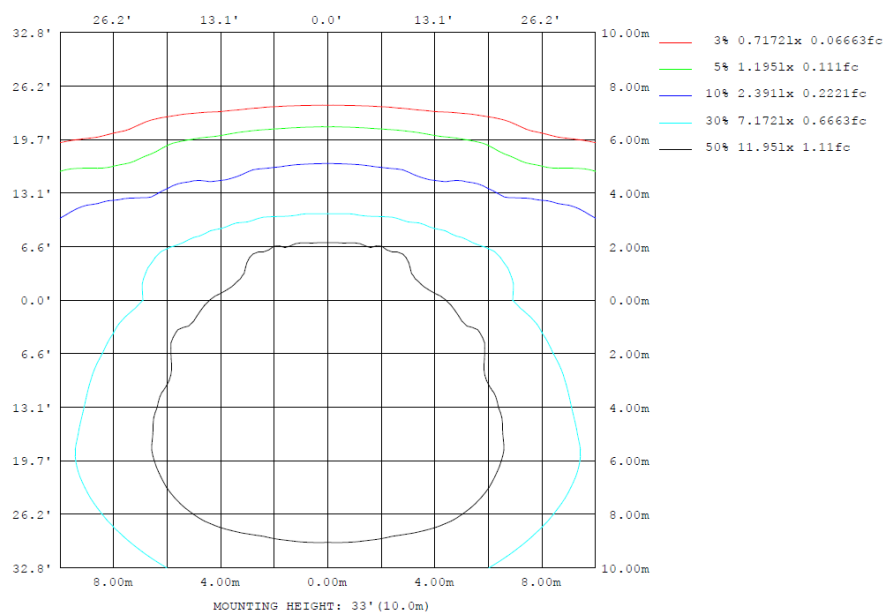
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

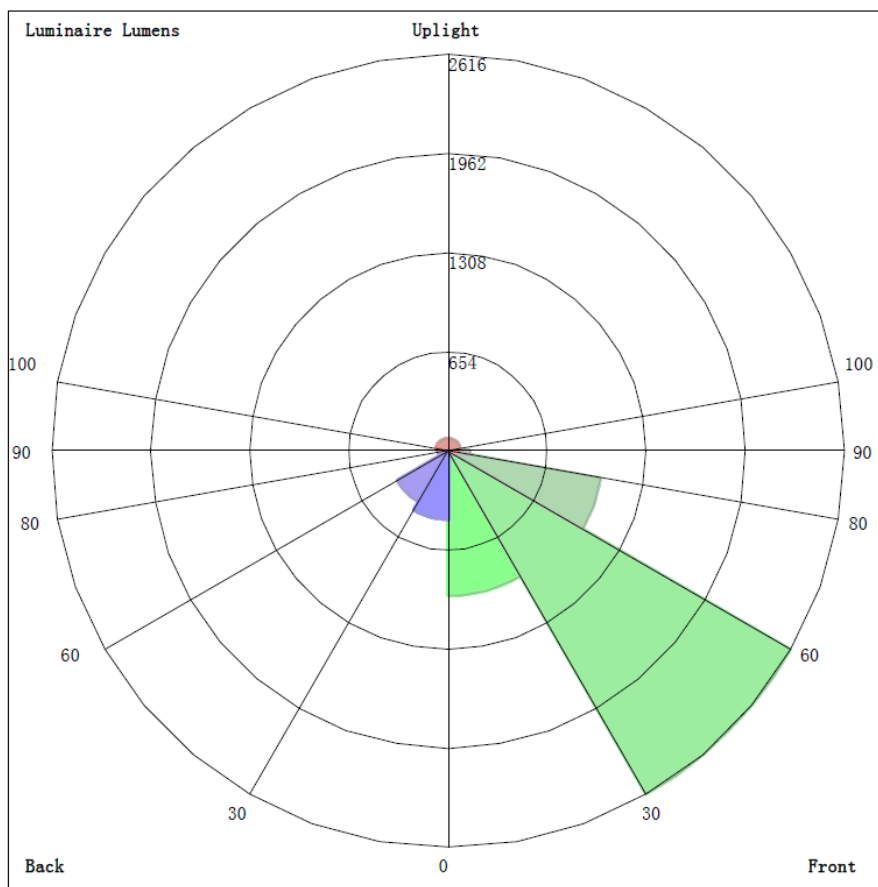
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	1803	2077	2132	2077	1803	1526	1358	1526	0- 10	168.6	168.6	2.91,2.91
20	1634	2233	2742	2233	1634	1043	572.0	1043	10- 20	479.2	647.8	11.2,11.2
30	1438	2710	3267	2710	1438	430.4	272.9	430.4	20- 30	756.8	1405	24.3,24.3
40	1149	2923	3332	2923	1149	254.1	82.18	254.1	30- 40	997.5	2402	41.5,41.5
50	893.9	2506	2513	2506	893.9	103.2	46.98	103.2	40- 50	1065	3467	59.9,59.9
60	628.6	1850	1908	1850	628.6	46.97	17.10	46.97	50- 60	938.4	4406	76.1,76.1
70	386.9	1182	1127	1182	386.9	5.728	0.8869	5.728	60- 70	708.0	5114	88.3,88.3
80	203.2	495.5	504.6	495.5	203.2	2.325	1.216	2.325	70- 80	380.3	5494	94.9,94.9
90	19.14	158.5	264.2	158.5	19.14	1.489	1.382	1.489	80- 90	151.8	5646	97.5,97.5
100	16.30	68.12	273.6	68.12	16.30	1.913	1.748	1.913	90-100	64.81	5711	98.6,98.6
110	13.17	14.75	45.07	14.75	13.17	1.495	1.926	1.495	100-110	30.15	5741	99.2,99.2
120	7.954	45.48	19.85	45.48	7.954	1.457	1.880	1.457	110-120	13.55	5754	99.4,99.4
130	4.347	38.38	45.30	38.38	4.347	1.568	2.196	1.568	120-130	15.46	5770	99.7,99.7
140	1.367	23.86	37.17	23.86	1.367	1.734	2.300	1.734	130-140	11.02	5781	99.9,99.9
150	1.062	11.74	19.53	11.74	1.062	1.958	2.310	1.958	140-150	5.614	5786	100,100
160	1.097	0.9234	7.622	0.9234	1.097	2.082	2.047	2.082	150-160	1.962	5788	100,100
170	1.286	1.218	1.319	1.218	1.286	1.706	1.595	1.706	160-170	0.5198	5789	100,100
180	1.566	1.514	1.277	1.514	1.566	1.437	1.360	1.437	170-180	0.1399	5789	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	168.59	0-10	168.59	2.91%
10-20	479.18	0-20	647.77	11.19%
20-30	756.75	0-30	1404.52	24.26%
30-40	997.49	0-40	2402.01	41.49%
40-50	1065.33	0-50	3467.34	59.90%
50-60	938.44	0-60	4405.78	76.11%
60-70	707.98	0-70	5113.76	88.34%
70-80	380.28	0-80	5494.04	94.91%
80-90	151.84	0-90	5645.88	97.53%
90-100	64.81	0-100	5710.69	98.65%
100-110	30.15	0-110	5740.84	99.17%
110-120	13.55	0-120	5754.39	99.40%
120-130	15.46	0-130	5769.85	99.67%
130-140	11.02	0-140	5780.87	99.86%
140-150	5.61	0-150	5786.48	99.96%
150-160	1.96	0-160	5788.44	99.99%
160-170	0.52	0-170	5788.96	100.00%
170-180	0.14	0-180	5789.10	100.00%

4.2 Goniophotometer Test

LCS/BUG

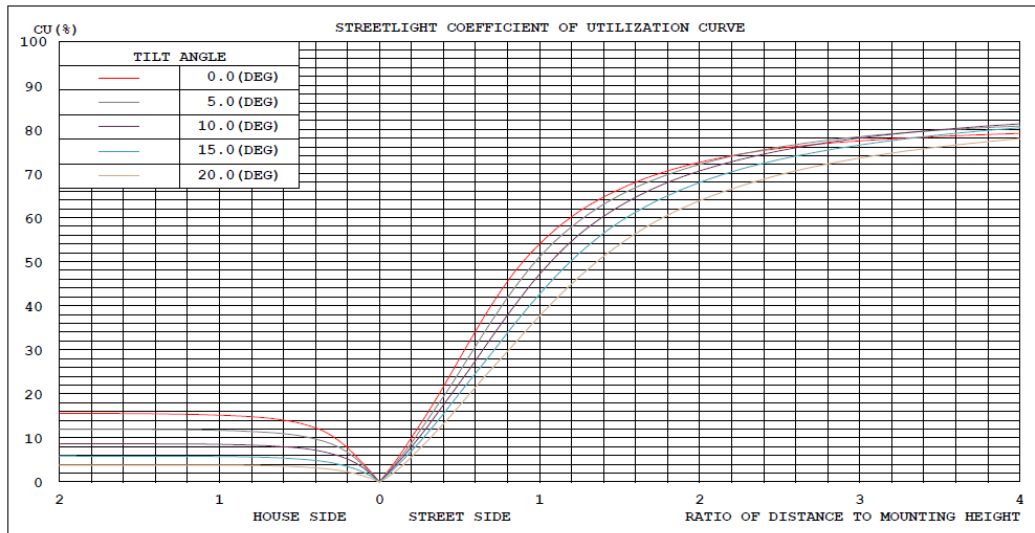


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

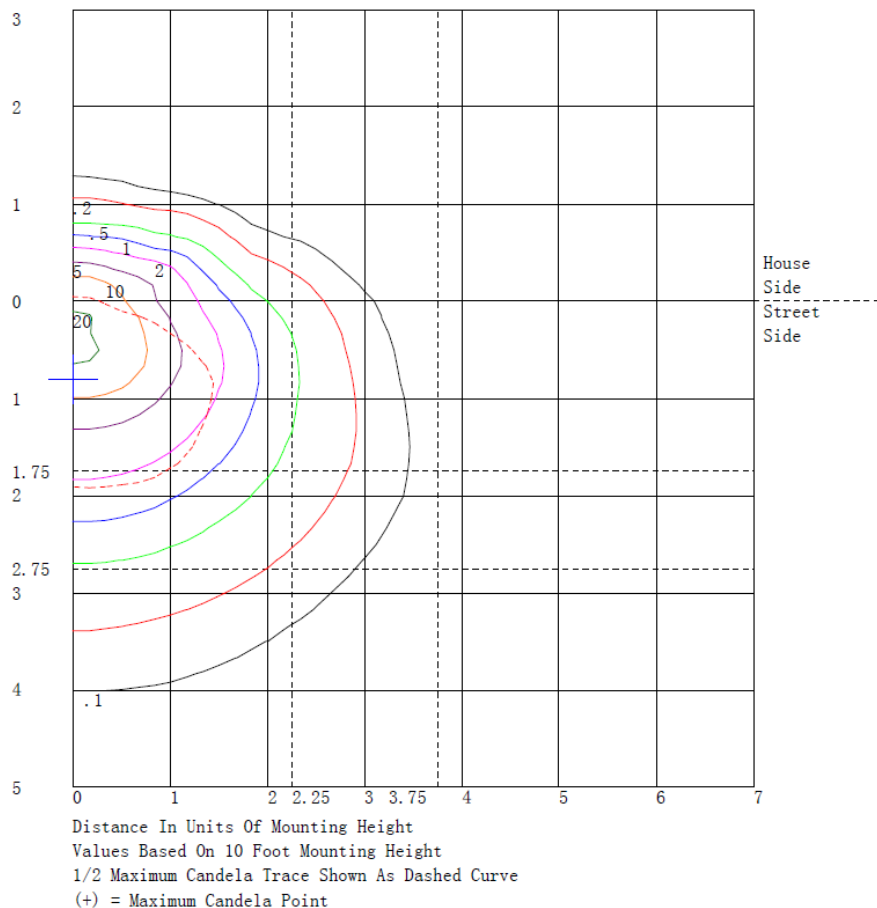
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	955.1	N.A.	16.5
FM - Front-Medium (30-60)	2616.5	N.A.	45.2
FH - Front-High (60-80)	1023.7	N.A.	17.7
FVH - Front-Very High (80-90)	144.8	N.A.	2.5
BL - Back-Low (0-30)	449.4	N.A.	7.8
BM - Back-Medium (30-60)	384.8	N.A.	6.6
BH - Back-High (60-80)	64.5	N.A.	1.1
BVH - Back-Very High (80-90)	7.0	N.A.	0.1
UL - Uplight-Low (90-100)	64.8	N.A.	1.1
UH - Uplight-High (100-180)	78.4	N.A.	1.4
Total	5789.0	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	1849	1849	1849	1848	1848	1847	1847	1847	1847	1846	1846	1845	1844	1844	1845	1845	1843	1842	1841
5	1887	1857	1838	1829	1840	1853	1863	1839	1813	1794	1813	1843	1878	1909	1935	1953	1949	1939	1927
10	1803	1787	1781	1785	1795	1817	1854	1921	1998	2077	2151	2213	2255	2246	2219	2185	2161	2143	2132
15	1732	1722	1741	1788	1892	2003	2103	2128	2134	2132	2155	2180	2203	2215	2222	2225	2227	2226	2222
20	1634	1644	1682	1748	1865	1992	2110	2167	2205	2233	2255	2286	2335	2459	2590	2705	2744	2753	2742
25	1535	1650	1756	1852	1934	2009	2082	2141	2213	2311	2503	2707	2894	2988	3048	3085	3122	3144	3152
30	1438	1642	1805	1929	1969	2001	2059	2263	2491	2710	2824	2910	2983	3091	3190	3268	3286	3283	3267
35	1271	1474	1657	1822	1953	2076	2204	2371	2548	2732	2932	3118	3273	3345	3381	3393	3401	3399	3388
40	1149	1358	1558	1749	1921	2091	2269	2496	2720	2923	3051	3149	3226	3309	3374	3414	3399	3367	3332
45	1046	1224	1413	1614	1838	2065	2286	2494	2676	2819	2878	2901	2901	2913	2914	2900	2847	2791	2748
50	894	1055	1243	1458	1741	2021	2268	2391	2466	2506	2539	2556	2564	2577	2583	2582	2561	2536	2513
55	755	905	1077	1269	1511	1752	1969	2104	2198	2255	2275	2271	2249	2221	2188	2159	2150	2145	2140
60	629	816	996	1170	1347	1510	1650	1741	1806	1850	1875	1891	1906	1956	2001	2031	1996	1950	1908
65	520	688	842	980	1103	1212	1308	1399	1475	1533	1554	1562	1563	1577	1590	1602	1609	1612	1611
70	387	482	581	685	804	920	1024	1096	1148	1182	1192	1190	1182	1185	1186	1183	1164	1144	1127
75	290	326	376	439	533	628	710	741	754	757	763	767	772	785	797	806	803	796	787
80	203	206	221	248	297	352	407	445	475	495	500	499	495	499	503	507	508	507	505
85	83.7	79.3	85.5	102	136	175	216	246	273	296	314	329	341	352	360	366	367	366	364
90	19.1	28.1	38.9	51.5	66.2	82.5	100	119	139	158	179	199	217	232	245	254	260	264	264
95	15.2	20.4	26.0	32.0	38.0	44.7	52.5	62.1	73.1	85.6	100	116	132	148	163	176	184	188	189
100	16.3	16.8	17.9	19.6	20.5	23.0	28.0	37.1	50.3	68.1	94.3	124	155	186	216	241	259	270	274
105	12.1	12.5	12.8	13.3	13.0	13.3	14.7	18.7	24.1	30.8	38.5	47.2	56.6	67.8	78.7	88.1	93.7	96.7	97.0
110	13.2	9.21	8.17	10.0	18.2	26.7	33.1	27.4	20.2	14.8	21.7	31.0	40.2	42.0	42.2	41.6	43.0	44.3	45.1
115	11.6	7.25	6.02	7.89	15.2	23.9	32.1	35.8	37.1	35.6	27.4	18.7	11.8	14.9	20.6	27.3	32.1	35.5	36.8
120	7.95	4.50	3.97	6.37	13.5	22.2	31.1	37.2	42.0	45.5	47.9	48.4	46.7	39.8	31.9	24.4	20.9	19.4	19.8
125	5.92	3.07	2.83	5.19	11.6	19.5	27.9	34.6	40.5	45.4	48.8	51.0	52.0	51.3	49.8	47.8	45.8	44.1	43.1
130	4.35	2.35	2.40	4.50	9.71	16.2	23.1	28.6	33.8	38.4	42.6	45.9	48.3	48.8	48.4	47.5	46.5	45.7	45.3
135	1.43	0.00	0.00	0.68	5.75	12.0	18.6	23.2	27.4	31.3	35.6	39.4	42.3	43.3	43.4	43.1	43.1	43.0	43.0
140	1.37	2.51	4.01	5.86	8.11	10.7	13.6	16.9	20.4	23.9	27.1	30.0	32.5	34.0	35.0	35.7	36.5	37.0	37.2
145	1.34	1.56	2.22	3.32	4.94	6.93	9.23	11.9	14.6	17.3	19.4	21.2	22.8	24.2	25.5	26.5	27.6	28.5	28.9
150	1.06	1.07	1.08	1.09	0.56	0.42	1.08	4.31	8.08	11.7	13.5	14.7	15.6	16.5	17.3	18.0	18.7	19.2	19.5
155	0.99	0.98	1.01	1.11	1.07	1.23	1.72	3.14	4.83	6.59	7.99	9.22	10.3	11.0	11.5	11.9	12.3	12.7	12.9
160	1.10	1.04	1.03	1.06	1.19	1.31	1.39	1.08	0.86	0.92	1.97	3.27	4.65	5.64	6.48	7.12	7.45	7.61	7.62
165	1.19	1.19	1.19	1.19	1.15	1.12	1.13	1.24	1.40	1.58	1.85	2.07	2.16	1.83	1.41	1.01	0.93	0.93	0.99
170	1.29	1.29	1.30	1.30	1.29	1.28	1.27	1.25	1.23	1.22	1.20	1.19	1.19	1.21	1.23	1.26	1.27	1.29	1.32
175	1.39	1.40	1.40	1.41	1.40	1.40	1.39	1.38	1.37	1.36	1.35	1.33	1.32	1.30	1.28	1.26	1.23	1.21	1.20
180	1.57	1.57	1.58	1.58	1.57	1.56	1.55	1.54	1.53	1.51	1.49	1.45	1.42	1.40	1.38	1.36	1.33	1.30	1.28

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	1842	1843	1845	1845	1844	1844	1845	1846	1846	1847	1847	1847	1847	1848	1848	1849	1849	1849	1850
5	1939	1949	1953	1935	1909	1878	1843	1813	1794	1813	1839	1863	1853	1840	1829	1838	1857	1887	1801
10	2143	2161	2185	2219	2246	2255	2213	2151	2077	1998	1921	1854	1817	1795	1785	1781	1787	1803	1754
15	2226	2227	2225	2222	2215	2203	2180	2155	2132	2134	2128	2103	2003	1892	1788	1741	1722	1732	1593
20	2753	2744	2705	2590	2459	2335	2286	2255	2233	2205	2167	2110	1992	1865	1748	1682	1644	1634	1494
25	3144	3122	3085	3048	2988	2894	2707	2503	2311	2213	2141	2082	2009	1934	1852	1756	1650	1535	1497
30	3283	3286	3268	3190	3091	2983	2910	2824	2710	2491	2263	2059	2001	1969	1929	1805	1642	1438	1395
35	3399	3401	3393	3381	3345	3273	3118	2932	2732	2548	2371	2204	2076	1953	1822	1657	1474	1271	1293
40	3367	3399	3414	3374	3309	3226	3149	3051	2923	2720	2496	2269	2091	1921	1749	1558	1358	1149	1173
45	2791	2847	2900	2914	2913	2901	2901	2878	2819	2676	2494	2286	2065	1838	1614	1413	1224	1046	1015
50	2536	2561	2582	2583	2577	2564	2556	2539	2506	2466	2391	2268	2021	1741	1458	1243	1055	894	808
55	2145	2150	2159	2188	2221	2249	2271	2275	2255	2198	2104	1969	1752	1511	1269	1077	905	755	627
60	1950	1996	2031	2001	1956	1906	1891	1875	1850	1806	1741	1650	1510	1347	1170	996	816	629	476
65	1612	1609	1602	1590	1577	1563	1562	1554	1533	1475	1399	1308	1212	1103	980	842	688	520	380
70	1144	1164	1183	1186	1185	1182	1190	1192	1182	1148	1096	1024	920	804	685	581	482	387	292
75	796	803	806	797	785	772	767	763	757	754	741	710	628	533	439	376	326	290	209
80	507	508	507	503	499	495	499	500	495	475	445	407	352	297	248	221	206	203	139
85	366	367	366	360	352	341	329	314	296	273	246	216	175	136	102	85.5	79.3	83.7	59.7
90	264	260	254	245	232	217	199	179	158	139	119	100	82.5	66.2	51.5	38.9	28.1	19.1	17.5
95	188	184	176	163	148	132	116	100	85.6	73.1	62.1	52.5	44.7	38.0	32.0	26.0	20.4	15.2	13.2
100	270	259	241	216	186	155	124	94.3	68.1	50.3	37.1	28.0	23.0	20.5	19.6	17.9	16.8	16.3	12.9
105	96.7	93.7	88.1	78.7	67.8	56.6	47.2	38.5	30.8	24.1	18.7	14.7	13.3	13.0	13.3	12.8	12.5	12.1	9.34
110	44.3	43.0	41.6	42.2	42.0	40.2	31.0	21.7	14.8	20.2	27.4	33.1	26.7	18.2	10.0	8.17	9.21	13.2	9.26
115	35.5	32.1	27.3	20.6	14.9	11.8	18.7	27.4	35.6	37.1	35.8	32.1	23.9	15.2	7.89	6.02	7.25	11.6	8.21
120	19.4	20.9	24.4	31.9	39.8	46.7	48.4	47.9	45.5	42.0	37.2	31.1	22.2	13.5	6.37	3.97	4.50	7.95	6.05
125	44.1	45.8	47.8	49.8	51.3	52.0	51.0	48.8	45.4	40.5	34.6	27.9	19.5	11.6	5.19	2.83	3.07	5.92	4.67
130	45.7	46.5	47.5	48.4	48.8	48.3	45.9	42.6	38.4	33.8	28.6	23.1	16.2	9.71	4.50	2.40	2.35	4.35	3.54
135	43.0	43.1	43.1	43.4	43.3	42.3	39.4	35.6	31.3	27.4	23.2	18.6	12.0	5.75	0.68	0.00	0.00	1.43	1.78
140	37.0	36.5	35.7	35.0	34.0	32.5	30.0	27.1	23.9	20.4	16.9	13.6	10.7	8.1	5.86	4.01	2.51	3.17	1.60
145	28.5	27.6	26.5	25.5	24.2	22.8	21.2	19.4	17.3	14.6	11.9	9.23	6.93	4.94	3.32	2.22	1.56	1.34	1.52
150	19.2	18.7	18.0	17.3	16.5	15.6	14.7	13.5	11.7	8.08	4.31	1.08	0.42	0.56	1.09	1.08	0.97	0.96	1.35
155	12.7	12.3	11.9	11.5	11.0	10.3	9.22	7.99	6.59	4.83	3.14	1.72	1.23	1.07	1.11	1.01	0.98	1.09	1.41
160	7.61	7.45	7.12	6.48	5.64	4.65	3.27	1.97	0.92	0.86	1.08	1.39	1.31	1.19	1.06	1.03	1.04	1.10	1.57
165	0.93	0.93	1.01	1.41	1.83	2.16	2.07	1.85	1.58	1.40	1.24	1.13	1.12	1.15	1.19	1.19	1.19	1.19	1.65
170	1.29	1.27	1.26	1.23	1.21	1.19	1.19	1.20	1.22	1.23	1.25	1.27	1.28	1.29	1.30	1.30	1.29	1.29	1.64
175	1.21	1.23	1.26	1.28	1.30	1.32	1.33	1.35	1.36	1.37	1.38	1.39	1.40	1.40	1.41	1.40	1.40	1.39	1.62
180	1.30	1.33	1.36	1.38	1.40	1.42	1.45	1.49	1.51	1.53	1.54	1.55	1.56	1.57	1.58	1.58	1.57	1.57	1.56

Table--3

UNIT: cd

C (DEG) y (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	1851	1851	1850	1850	1848	1847	1846	1844	1843	1843	1842	1843	1843	1844	1842	1841	1841	1841	1842
5	1738	1697	1698	1707	1708	1645	1575	1513	1505	1513	1527	1527	1525	1522	1518	1514	1513	1514	1518
10	1703	1652	1589	1533	1491	1493	1507	1526	1529	1527	1516	1489	1456	1423	1394	1372	1358	1372	1394
15	1489	1419	1402	1407	1419	1414	1400	1376	1327	1269	1209	1152	1102	1066	1063	1071	1084	1071	1063
20	1389	1318	1309	1313	1310	1232	1139	1043	982	928	874	804	735	672	623	589	572	589	623
25	1444	1377	1292	1196	1092	986	878	768	646	534	443	408	395	394	384	377	374	377	384
30	1334	1254	1155	1038	906	736	571	430	378	356	351	328	308	292	282	275	273	275	282
35	1262	1179	1008	812	620	502	412	345	297	263	239	213	191	174	162	156	154	156	162
40	1138	1044	840	615	407	324	279	254	210	171	138	116	101	90.5	84.5	82.1	82.2	82.1	84.5
45	948	845	673	490	322	242	192	162	128	103	85.2	77.0	73.8	73.5	70.6	68.6	67.4	68.6	70.6
50	714	611	487	364	254	185	136	103	82.9	71.8	66.4	59.2	54.0	50.5	48.2	47.2	47.0	47.2	48.2
55	511	409	319	243	179	133	98.7	74.3	58.0	48.0	42.6	38.7	36.7	36.0	34.9	34.1	33.8	34.1	34.9
60	350	251	188	144	115	85.9	63.4	47.0	36.4	29.9	26.2	22.7	20.5	19.1	17.9	17.3	17.1	17.3	17.9
65	266	177	124	90.2	69.8	49.8	35.3	24.9	15.8	9.03	4.43	1.90	0.75	0.52	0.32	0.43	0.69	0.43	0.32
70	211	146	100.0	66.1	42.3	24.4	12.7	5.73	1.79	0.37	0.51	0.20	0.30	0.60	0.69	0.79	0.89	0.79	0.69
75	142	89.2	55.9	34.3	21.3	11.5	5.96	3.39	1.39	0.62	0.62	0.45	0.49	0.67	0.79	0.92	1.06	0.92	0.79
80	86.9	48.4	27.4	16.2	11.4	6.30	3.52	2.33	1.26	0.81	0.76	0.65	0.66	0.77	0.91	1.06	1.22	1.06	0.91
85	40.2	25.2	16.1	10.4	7.22	4.38	2.62	1.68	1.09	0.88	0.91	0.84	0.84	0.90	1.02	1.15	1.29	1.15	1.02
90	15.6	13.4	10.5	7.59	4.97	3.36	2.22	1.49	1.14	1.03	1.06	1.03	1.04	1.08	1.17	1.27	1.38	1.27	1.17
95	11.3	9.37	7.38	5.53	3.92	2.82	2.03	1.50	1.27	1.20	1.23	1.21	1.22	1.26	1.32	1.40	1.50	1.40	1.32
100	9.98	7.57	5.75	4.36	3.35	2.64	2.18	1.91	1.74	1.67	1.65	1.59	1.56	1.56	1.59	1.66	1.75	1.66	1.59
105	6.96	4.96	3.32	2.10	1.32	1.26	1.50	1.84	1.87	1.86	1.82	1.80	1.78	1.77	1.81	1.87	1.95	1.87	1.81
110	6.17	3.92	2.82	2.31	2.15	1.82	1.60	1.49	1.54	1.65	1.78	1.82	1.85	1.87	1.88	1.90	1.93	1.90	1.88
115	5.55	3.57	2.54	2.02	1.83	1.61	1.51	1.49	1.52	1.57	1.64	1.66	1.68	1.70	1.73	1.76	1.79	1.76	1.73
120	4.48	3.25	2.43	1.90	1.59	1.43	1.40	1.46	1.51	1.59	1.67	1.71	1.74	1.77	1.81	1.85	1.88	1.85	1.81
125	3.63	2.79	2.19	1.78	1.52	1.42	1.42	1.49	1.57	1.66	1.76	1.80	1.84	1.87	1.92	1.97	2.01	1.97	1.92
130	2.87	2.32	1.91	1.63	1.46	1.43	1.48	1.57	1.63	1.70	1.78	1.86	1.94	2.02	2.09	2.15	2.20	2.15	2.09
135	2.00	2.07	1.91	1.69	1.48	1.48	1.55	1.65	1.73	1.81	1.90	1.96	2.03	2.08	2.14	2.19	2.23	2.19	2.14
140	1.76	1.84	1.78	1.68	1.58	1.61	1.66	1.73	1.79	1.85	1.92	1.99	2.06	2.12	2.19	2.25	2.30	2.25	2.19
145	1.65	1.73	1.75	1.74	1.73	1.76	1.80	1.84	1.91	1.98	2.04	2.08	2.12	2.16	2.23	2.29	2.34	2.29	2.23
150	1.58	1.74	1.81	1.83	1.84	1.88	1.92	1.96	2.00	2.03	2.06	2.09	2.12	2.15	2.21	2.26	2.31	2.26	2.21
155	1.74	1.96	2.05	2.06	2.04	2.02	2.00	1.99	2.00	2.02	2.05	2.09	2.14	2.17	2.17	2.16	2.15	2.16	2.17
160	1.92	2.16	2.24	2.24	2.18	2.15	2.12	2.08	2.08	2.09	2.09	2.06	2.03	2.01	2.02	2.03	2.05	2.03	2.02
165	1.99	2.22	2.27	2.24	2.16	2.12	2.08	2.04	2.02	2.00	1.98	1.91	1.85	1.79	1.81	1.84	1.86	1.84	1.81
170	1.90	2.06	2.08	2.03	1.93	1.86	1.78	1.71	1.68	1.66	1.65	1.63	1.61	1.60	1.59	1.59	1.59	1.59	1.59
175	1.79	1.90	1.92	1.88	1.82	1.72	1.62	1.54	1.52	1.53	1.54	1.50	1.45	1.42	1.43	1.45	1.48	1.45	1.43
180	1.55	1.54	1.54	1.53	1.52	1.50	1.47	1.44	1.40	1.37	1.34	1.32	1.30	1.30	1.32	1.34	1.36	1.34	1.32

																UNIT: cd							
C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355								
0	1844	1843	1843	1842	1843	1843	1844	1846	1847	1848	1850	1850	1851	1851	1850								
5	1522	1525	1527	1527	1513	1505	1513	1575	1645	1708	1707	1698	1697	1738	1801								
10	1423	1456	1489	1516	1527	1529	1526	1507	1493	1491	1533	1589	1652	1703	1754								
15	1066	1102	1152	1209	1269	1327	1376	1400	1414	1419	1407	1402	1419	1489	1593								
20	672	735	804	874	928	982	1043	1139	1232	1310	1313	1309	1318	1389	1494								
25	394	395	408	443	534	646	768	878	986	1092	1196	1292	1377	1444	1497								
30	292	308	328	351	356	378	430	571	736	906	1038	1155	1254	1334	1395								
35	174	191	213	239	263	297	345	412	502	620	812	1008	1179	1262	1293								
40	90.5	101	116	138	171	210	254	279	324	407	615	840	1044	1138	1173								
45	73.5	73.8	77.0	85.2	103	128	162	192	242	322	490	673	845	948	1015								
50	50.5	54.0	59.2	66.4	71.8	82.9	103	136	185	254	364	487	611	714	808								
55	36.0	36.7	38.7	42.6	48.0	58.0	74.3	98.7	133	179	243	319	409	511	627								
60	19.1	20.5	22.7	26.2	29.9	36.4	47.0	63.4	85.9	115	144	188	251	350	476								
65	0.52	0.75	1.90	4.43	9.03	15.8	24.9	35.3	49.8	69.8	90.2	124	177	266	380								
70	0.60	0.30	0.20	0.51	0.37	1.79	5.73	12.7	24.4	42.3	66.1	100.0	146	211	292								
75	0.67	0.49	0.45	0.62	0.62	1.39	3.39	5.96	11.5	21.3	34.3	55.9	89.2	142	209								
80	0.77	0.66	0.65	0.76	0.81	1.26	2.33	3.52	6.30	11.4	16.2	27.4	48.4	86.9	139								
85	0.90	0.84	0.84	0.91	0.88	1.09	1.68	2.62	4.38	7.22	10.4	16.1	25.2	40.2	59.7								
90	1.08	1.04	1.03	1.06	1.03	1.14	1.49	2.22	3.36	4.97	7.59	10.5	13.4	15.6	17.5								
95	1.26	1.22	1.21	1.23	1.20	1.27	1.50	2.03	2.82	3.92	5.53	7.38	9.37	11.3	13.2								
100	1.56	1.56	1.59	1.65	1.67	1.74	1.91	2.18	2.64	3.35	4.36	5.75	7.57	9.98	12.9								
105	1.77	1.78	1.80	1.82	1.86	1.87	1.84	1.50	1.26	1.32	2.10	3.32	4.96	6.96	9.34								
110	1.87	1.85	1.82	1.78	1.65	1.54	1.49	1.60	1.82	2.15	2.31	2.82	3.92	6.17	9.26								
115	1.70	1.68	1.66	1.64	1.57	1.52	1.49	1.51	1.61	1.83	2.02	2.54	3.57	5.55	8.21								
120	1.77	1.74	1.71	1.67	1.59	1.51	1.46	1.40	1.43	1.59	1.90	2.43	3.25	4.48	6.05								
125	1.87	1.84	1.80	1.76	1.66	1.57	1.49	1.42	1.42	1.52	1.78	2.19	2.79	3.63	4.67								
130	2.02	1.94	1.86	1.78	1.70	1.63	1.57	1.48	1.43	1.46	1.63	1.91	2.32	2.87	3.54								
135	2.08	2.03	1.96	1.90	1.81	1.73	1.65	1.55	1.48	1.48	1.69	1.91	2.07	2.00	1.78								
140	2.12	2.06	1.99	1.92	1.85	1.79	1.73	1.66	1.61	1.58	1.68	1.78	1.84	1.76	1.60								
145	2.16	2.12	2.08	2.04	1.98	1.91	1.84	1.80	1.76	1.73	1.74	1.75	1.73	1.65	1.52								
150	2.15	2.12	2.09	2.06	2.03	2.00	1.96	1.92	1.88	1.84	1.83	1.81	1.74	1.58	1.35								
155	2.17	2.14	2.09	2.05	2.02	2.00	1.99	2.00	2.02	2.04	2.06	2.05	1.96	1.74	1.41								
160	2.01	2.03	2.06	2.09	2.09	2.08	2.08	2.12	2.15	2.18	2.24	2.24	2.16	1.92	1.57								
165	1.79	1.85	1.91	1.98	2.00	2.02	2.04	2.08	2.12	2.16	2.24	2.27	2.22	1.99	1.65								
170	1.60	1.61	1.63	1.65	1.66	1.68	1.71	1.78	1.86	1.93	2.03	2.08	2.06	1.90	1.64								
175	1.42	1.45	1.50	1.54	1.53	1.52	1.54	1.62	1.72	1.82	1.88	1.92	1.90	1.79	1.62								
180	1.30	1.30	1.32	1.34	1.37	1.40	1.44	1.47	1.50	1.52	1.53	1.54	1.54	1.55	1.56								

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	WPX2 @ 40W / 3000K	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±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	0.336	40.0	0.992	1.95
277.0	60	0.167	39.4	0.851	28.70

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*****