

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

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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		9509
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		144.5
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		9255
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	140.7
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		65.8
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	5.18
			277V	12.01
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.993
			277V	0.874
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3045±175	3103
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		82.9
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		85
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		97
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-11%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		2.2%
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		0.552
(Goniophotometer – Section 4.2)		Non-Worst Case		0.269
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		65.8
(Goniophotometer – Section 4.2)		Non-Worst Case		65.1

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-10-20	WPX3 @ 65W / 3000K	231020001-S1
2	Goniophotometer Test	2023-10-20	WPX3 @ 65W / 3000K	231020001-S1
3	THD and PF Test	2023-10-20	WPX3 @ 65W / 3000K	231020001-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. WPX3 @ 65W / 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.	WPX3 @ 65W / 3000K	Sample ID	231020001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

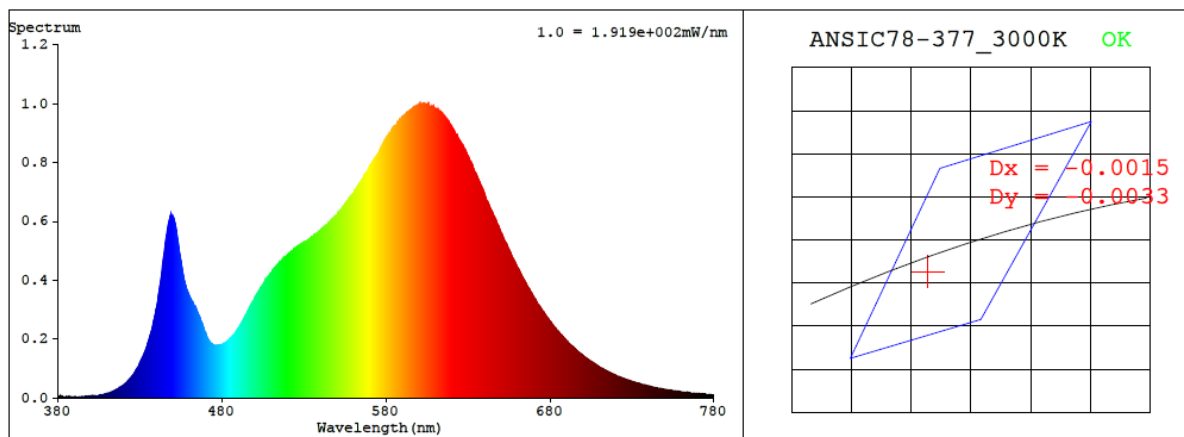
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.552	65.8	0.993
277.0	60	0.269	65.1	0.874

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3103	82.9	8	-0.0011	85	97	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4283$ $y = 0.3982$ / $u' = 0.2475$ $v' = 0.5177$ ($duv = -1.12e-03$)

CCT= 3103K Prcp WL: Ld=582.8nm Purity=48.1%

Peak WL: Lp=603nm FWHM: =132.8nm Ratio: R=22.4% G=75.0% B=2.6%

Render Index: Ra = 82.9 AvgR = 77.3 TM30: Rf=84 Rg=97

EEI: 0.09302 A++ Highest

R1 =81 R2 =91 R3 =97 R4 =82 R5 =82 R6 =88 R7 =83

R8 =60 R9 =8 R10=78 R11=81 R12=72 R13=84 R14=99 R15=74

4.1 Integrating Sphere Test

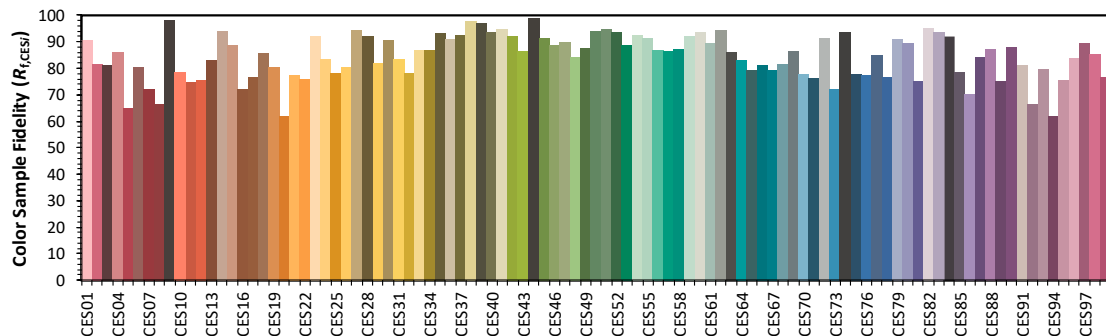
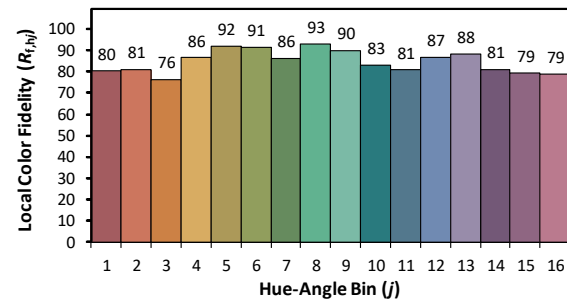
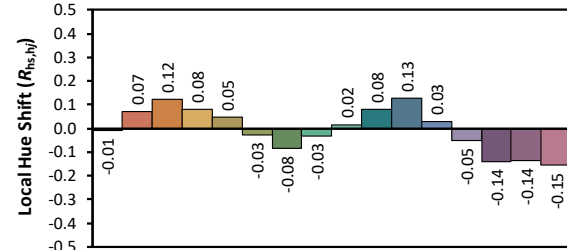
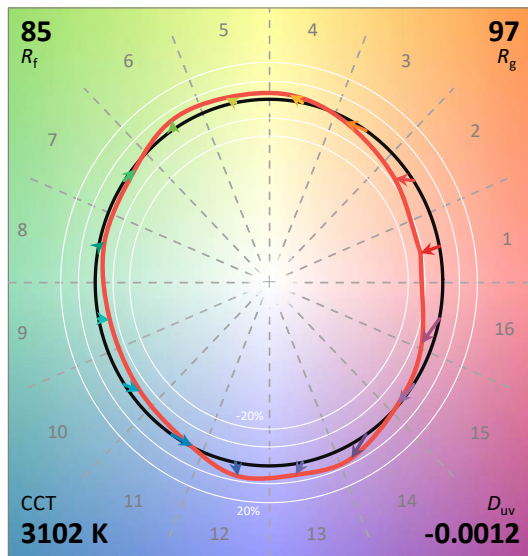
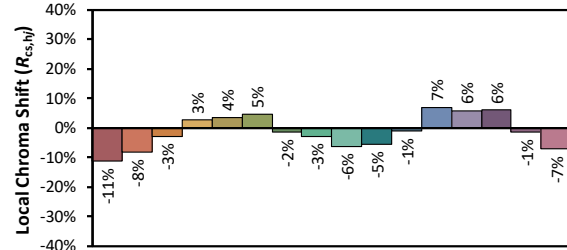
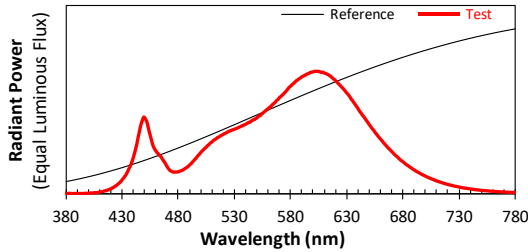
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/10/26

Model: WPX3 @ 65W / 3000K



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

x 0.4283
 y 0.3981
 u' 0.2476
 v' 0.5177

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	5.50E-06	447	5.78E-04	514	4.53E-04	581	8.88E-04	648	5.91E-04	715	9.09E-05
381	3.50E-06	448	6.04E-04	515	4.61E-04	582	8.96E-04	649	5.78E-04	716	8.77E-05
382	4.00E-06	449	6.25E-04	516	4.64E-04	583	9.04E-04	650	5.64E-04	717	8.53E-05
383	4.90E-06	450	6.19E-04	517	4.70E-04	584	9.12E-04	651	5.53E-04	718	8.22E-05
384	3.40E-06	451	6.02E-04	518	4.76E-04	585	9.22E-04	652	5.39E-04	719	7.98E-05
385	3.90E-06	452	5.82E-04	519	4.80E-04	586	9.26E-04	653	5.27E-04	720	7.74E-05
386	1.10E-06	453	5.43E-04	520	4.86E-04	587	9.35E-04	654	5.17E-04	721	7.45E-05
387	3.70E-06	454	5.05E-04	521	4.91E-04	588	9.41E-04	655	5.02E-04	722	7.29E-05
388	3.60E-06	455	4.70E-04	522	4.96E-04	589	9.47E-04	656	4.92E-04	723	7.03E-05
389	3.10E-06	456	4.36E-04	523	4.99E-04	590	9.54E-04	657	4.79E-04	724	6.80E-05
390	3.30E-06	457	4.02E-04	524	5.06E-04	591	9.59E-04	658	4.69E-04	725	6.61E-05
391	3.80E-06	458	3.79E-04	525	5.10E-04	592	9.62E-04	659	4.57E-04	726	6.35E-05
392	3.50E-06	459	3.62E-04	526	5.14E-04	593	9.67E-04	660	4.46E-04	727	6.16E-05
393	3.70E-06	460	3.48E-04	527	5.16E-04	594	9.73E-04	661	4.36E-04	728	6.02E-05
394	3.40E-06	461	3.36E-04	528	5.22E-04	595	9.78E-04	662	4.25E-04	729	5.80E-05
395	3.60E-06	462	3.26E-04	529	5.24E-04	596	9.80E-04	663	4.14E-04	730	5.60E-05
396	3.80E-06	463	3.14E-04	530	5.27E-04	597	9.87E-04	664	4.03E-04	731	5.43E-05
397	5.90E-06	464	3.07E-04	531	5.31E-04	598	9.90E-04	665	3.93E-04	732	5.24E-05
398	4.30E-06	465	2.95E-04	532	5.34E-04	599	9.93E-04	666	3.83E-04	733	5.06E-05
399	5.40E-06	466	2.79E-04	533	5.39E-04	600	9.94E-04	667	3.73E-04	734	4.91E-05
400	6.40E-06	467	2.65E-04	534	5.43E-04	601	9.98E-04	668	3.64E-04	735	4.78E-05
401	6.80E-06	468	2.53E-04	535	5.47E-04	602	9.98E-04	669	3.55E-04	736	4.60E-05
402	7.30E-06	469	2.36E-04	536	5.52E-04	603	9.98E-04	670	3.45E-04	737	4.52E-05
403	8.10E-06	470	2.21E-04	537	5.56E-04	604	9.99E-04	671	3.36E-04	738	4.32E-05
404	8.20E-06	471	2.06E-04	538	5.59E-04	605	9.97E-04	672	3.26E-04	739	4.20E-05
405	9.10E-06	472	1.96E-04	539	5.64E-04	606	9.96E-04	673	3.16E-04	740	4.05E-05
406	1.04E-05	473	1.88E-04	540	5.68E-04	607	9.89E-04	674	3.10E-04	741	3.92E-05
407	1.05E-05	474	1.84E-04	541	5.74E-04	608	9.91E-04	675	3.01E-04	742	3.78E-05
408	1.20E-05	475	1.79E-04	542	5.79E-04	609	9.90E-04	676	2.92E-04	743	3.66E-05
409	1.35E-05	476	1.78E-04	543	5.84E-04	610	9.83E-04	677	2.84E-04	744	3.57E-05
410	1.54E-05	477	1.78E-04	544	5.85E-04	611	9.81E-04	678	2.75E-04	745	3.43E-05
411	1.68E-05	478	1.79E-04	545	5.95E-04	612	9.77E-04	679	2.69E-04	746	3.31E-05
412	1.89E-05	479	1.79E-04	546	5.99E-04	613	9.72E-04	680	2.61E-04	747	3.23E-05
413	2.08E-05	480	1.81E-04	547	6.05E-04	614	9.68E-04	681	2.54E-04	748	3.15E-05
414	2.41E-05	481	1.85E-04	548	6.07E-04	615	9.61E-04	682	2.47E-04	749	3.00E-05
415	2.64E-05	482	1.87E-04	549	6.16E-04	616	9.54E-04	683	2.39E-04	750	2.93E-05
416	2.91E-05	483	1.91E-04	550	6.19E-04	617	9.46E-04	684	2.33E-04	751	2.81E-05
417	3.18E-05	484	1.96E-04	551	6.31E-04	618	9.37E-04	685	2.26E-04	752	2.73E-05
418	3.50E-05	485	2.01E-04	552	6.35E-04	619	9.31E-04	686	2.20E-04	753	2.68E-05
419	3.98E-05	486	2.08E-04	553	6.39E-04	620	9.22E-04	687	2.14E-04	754	2.59E-05
420	4.29E-05	487	2.13E-04	554	6.49E-04	621	9.13E-04	688	2.08E-04	755	2.53E-05
421	4.82E-05	488	2.20E-04	555	6.57E-04	622	9.02E-04	689	2.01E-04	756	2.44E-05
422	5.31E-05	489	2.28E-04	556	6.65E-04	623	8.94E-04	690	1.95E-04	757	2.33E-05
423	5.90E-05	490	2.37E-04	557	6.73E-04	624	8.84E-04	691	1.90E-04	758	2.29E-05
424	6.46E-05	491	2.45E-04	558	6.81E-04	625	8.74E-04	692	1.84E-04	759	2.21E-05
425	7.16E-05	492	2.55E-04	559	6.88E-04	626	8.65E-04	693	1.79E-04	760	2.13E-05
426	7.92E-05	493	2.65E-04	560	6.93E-04	627	8.54E-04	694	1.74E-04	761	2.05E-05
427	8.76E-05	494	2.76E-04	561	7.05E-04	628	8.44E-04	695	1.69E-04	762	1.98E-05
428	9.59E-05	495	2.85E-04	562	7.09E-04	629	8.32E-04	696	1.63E-04	763	1.95E-05
429	1.04E-04	496	2.95E-04	563	7.20E-04	630	8.22E-04	697	1.58E-04	764	1.91E-05
430	1.18E-04	497	3.08E-04	564	7.29E-04	631	8.11E-04	698	1.54E-04	765	1.82E-05
431	1.29E-04	498	3.17E-04	565	7.37E-04	632	7.99E-04	699	1.50E-04	766	1.74E-05
432	1.41E-04	499	3.28E-04	566	7.44E-04	633	7.87E-04	700	1.45E-04	767	1.71E-05
433	1.53E-04	500	3.39E-04	567	7.56E-04	634	7.70E-04	701	1.40E-04	768	1.64E-05
434	1.70E-04	501	3.49E-04	568	7.65E-04	635	7.61E-04	702	1.36E-04	769	1.60E-05
435	1.88E-04	502	3.58E-04	569	7.72E-04	636	7.46E-04	703	1.32E-04	770	1.56E-05
436	2.09E-04	503	3.67E-04	570	7.85E-04	637	7.34E-04	704	1.28E-04	771	1.49E-05
437	2.25E-04	504	3.76E-04	571	7.92E-04	638	7.20E-04	705	1.24E-04	772	1.47E-05
438	2.50E-04	505	3.83E-04	572	8.01E-04	639	7.08E-04	706	1.21E-04	773	1.40E-05
439	2.74E-04	506	3.94E-04	573	8.09E-04	640	6.95E-04	707	1.17E-04	774	1.37E-05
440	3.05E-04	507	4.01E-04	574	8.19E-04	641	6.78E-04	708	1.13E-04	775	1.32E-05
441	3.37E-04	508	4.10E-04	575	8.28E-04	642	6.66E-04	709	1.10E-04	776	1.28E-05
442	3.74E-04	509	4.18E-04	576	8.38E-04	643	6.54E-04	710	1.06E-04	777	1.22E-05
443	4.11E-04	510	4.25E-04	577	8.49E-04	644	6.40E-04	711	1.02E-04	778	1.20E-05
444	4.60E-04	511	4.34E-04	578	8.61E-04	645	6.31E-04	712	9.95E-05	779	1.20E-05
445	4.99E-04	512	4.41E-04	579	8.71E-04	646	6.17E-04	713	9.67E-05	780	1.20E-05
446	5.44E-04	513	4.46E-04	580	8.78E-04	647	6.04E-04	714	9.39E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	WPX3 @ 65W / 3000K	Sample ID	231020001-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	24.8	Humidity (%RH)	42.9

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	0.552	65.8	0.993
NON-WORST CASE	277.0	60	0.269	65.1	0.874

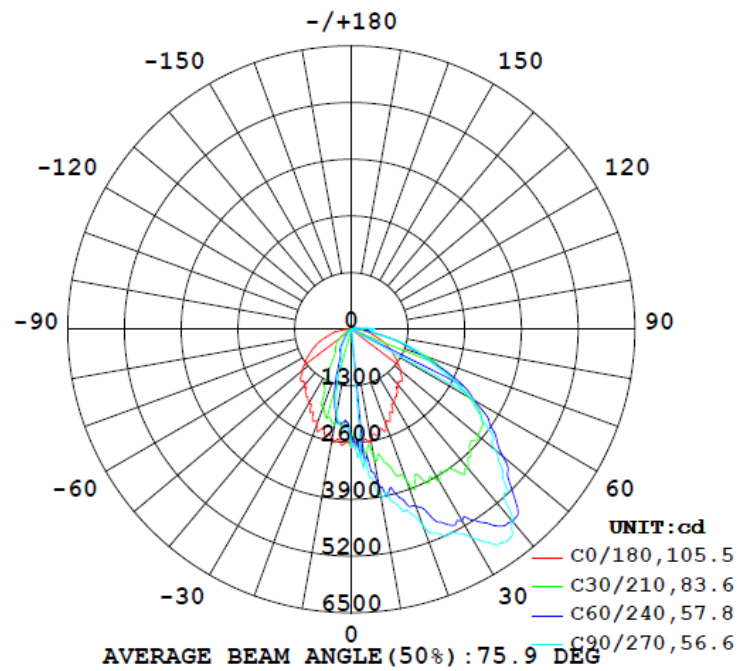
Test Result

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	9509	105.8	147.6	56.6	100.5	144.5	2.1%	B2-U3-G2
0°-90° zones	9255	105.8	147.6	56.6	100.5	140.7	2.2%	B2-U3-G2

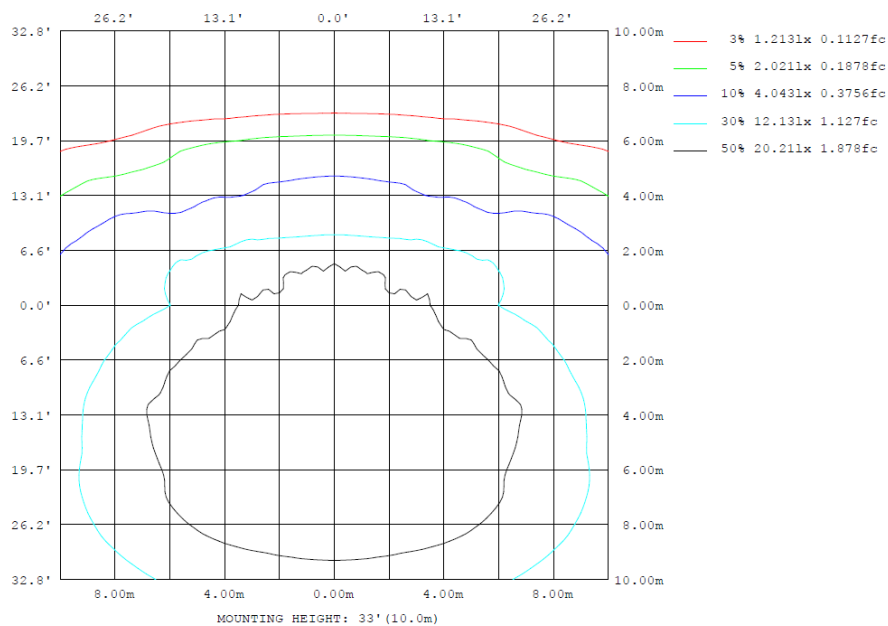
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

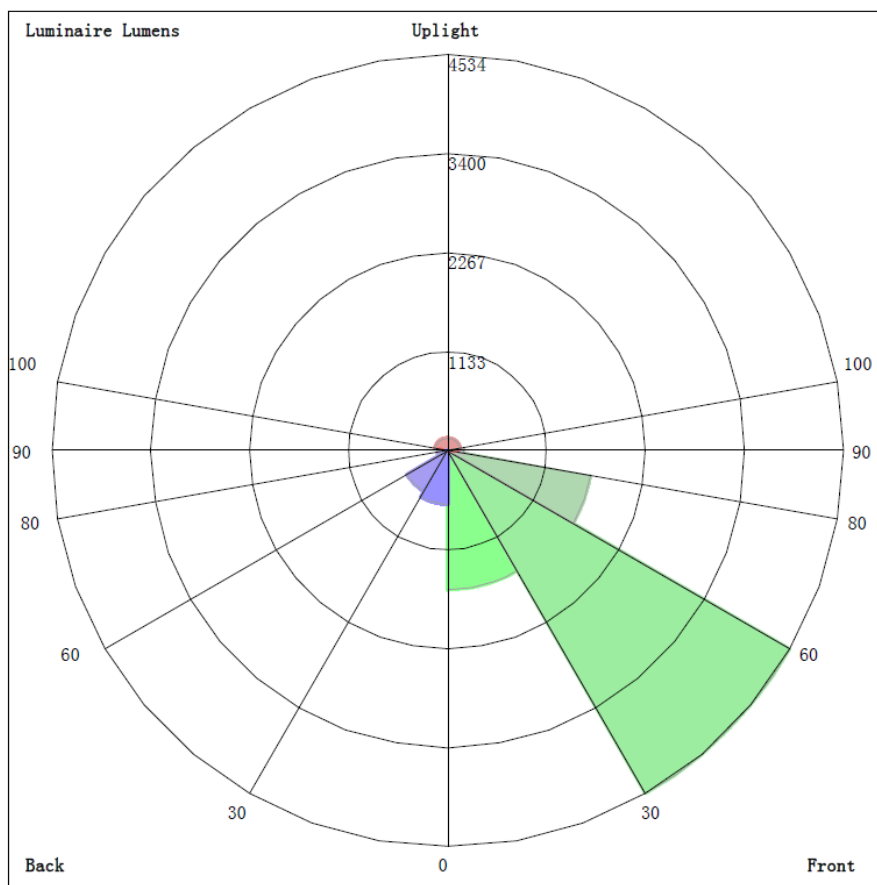
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	2589	3250	3867	3250	2589	2077	1942	2077	0- 10	243.2	243.2	2.56,2.56
20	2319	4109	4774	4109	2319	1290	668.4	1290	10- 20	747.9	991.1	10.4,10.4
30	1956	4770	5527	4770	1956	588.1	404.2	588.1	20- 30	1213	2204	23.2,23.2
40	1676	4786	5727	4786	1676	376.4	132.0	376.4	30- 40	1644	3848	40.5,40.5
50	1481	4632	4313	4632	1481	166.1	63.08	166.1	40- 50	1808	5656	59.5,59.5
60	1091	3340	3220	3340	1091	85.02	24.14	85.02	50- 60	1619	7275	76.5,76.5
70	735.1	1837	1745	1837	735.1	11.32	1.131	11.32	60- 70	1182	8457	88.9,88.9
80	413.7	615.6	569.4	615.6	413.7	5.273	1.799	5.273	70- 80	595.2	9052	95.2,95.2
90	36.03	192.2	495.2	192.2	36.03	3.571	2.435	3.571	80- 90	203.1	9255	97.3,97.3
100	33.93	156.2	211.7	156.2	33.93	3.702	3.412	3.702	90-100	110.1	9365	98.5,98.5
110	16.15	55.49	72.61	55.49	16.15	2.918	3.961	2.918	100-110	43.86	9409	99,99
120	15.40	95.57	59.37	95.57	15.40	2.719	3.249	2.719	110-120	29.52	9439	99.3,99.3
130	7.982	77.97	97.07	77.97	7.982	2.754	3.715	2.754	120-130	31.37	9470	99.6,99.6
140	1.433	45.10	91.18	45.10	1.433	2.992	3.946	2.992	130-140	23.29	9493	99.8,99.8
150	1.510	18.94	41.04	18.94	1.510	3.267	3.785	3.267	140-150	11.18	9504	100,100
160	1.801	1.513	12.09	1.513	1.801	3.326	3.269	3.326	150-160	3.326	9508	100,100
170	2.114	2.032	2.052	2.032	2.114	2.681	2.352	2.681	160-170	0.8250	9509	100,100
180	2.475	2.366	2.061	2.366	2.475	2.300	2.148	2.300	170-180	0.2236	9509	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	243.16	0-10	243.16	2.56%
10-20	747.91	0-20	991.07	10.42%
20-30	1212.91	0-30	2203.98	23.18%
30-40	1643.91	0-40	3847.89	40.47%
40-50	1808.28	0-50	5656.17	59.48%
50-60	1618.82	0-60	7274.99	76.51%
60-70	1181.77	0-70	8456.76	88.94%
70-80	595.23	0-80	9051.99	95.20%
80-90	203.14	0-90	9255.13	97.33%
90-100	110.06	0-100	9365.19	98.49%
100-110	43.86	0-110	9409.05	98.95%
110-120	29.52	0-120	9438.57	99.26%
120-130	31.37	0-130	9469.94	99.59%
130-140	23.29	0-140	9493.23	99.84%
140-150	11.18	0-150	9504.41	99.96%
150-160	3.33	0-160	9507.74	99.99%
160-170	0.83	0-170	9508.57	100.00%
170-180	0.22	0-180	9508.79	100.00%

4.2 Goniophotometer Test

LCS/BUG

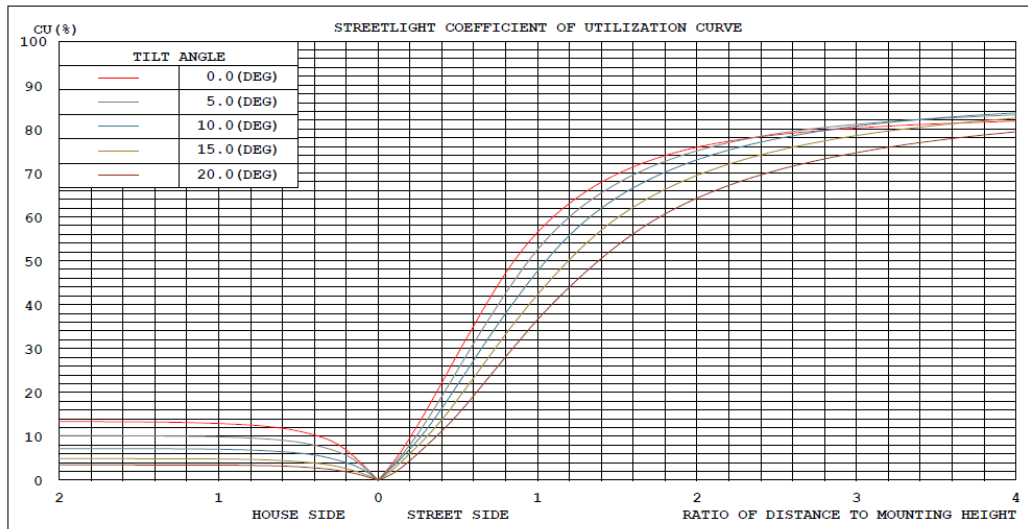


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

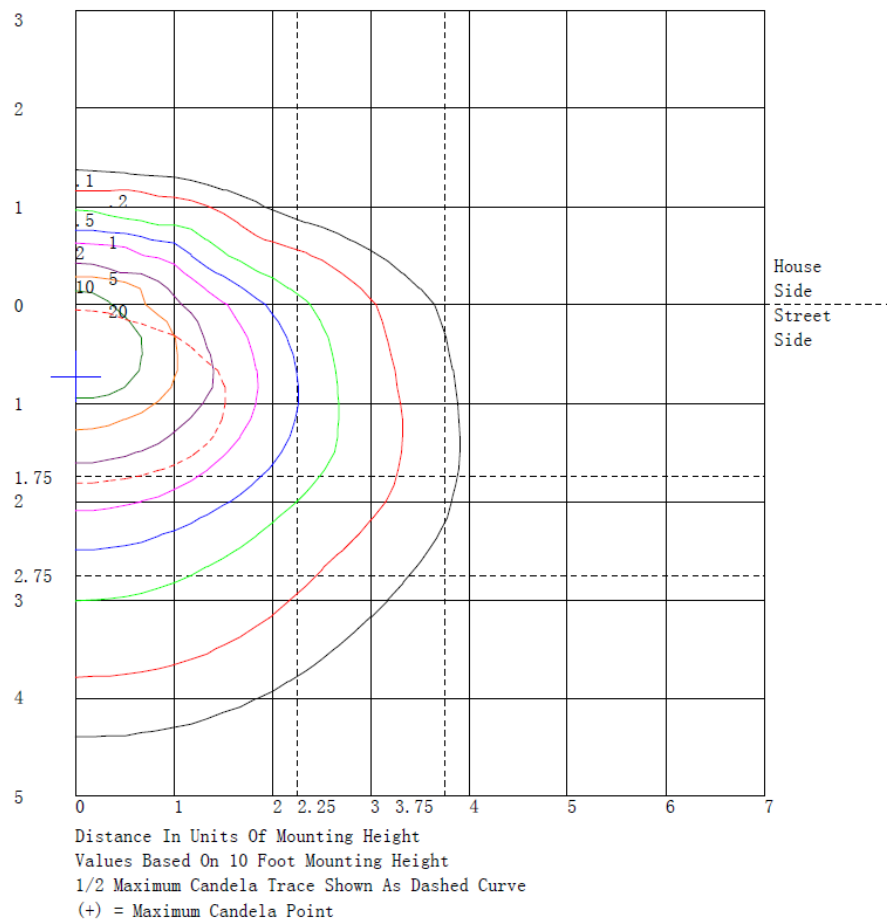
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1591.3	N.A.	16.7
FM - Front-Medium (30-60)	4534.0	N.A.	47.7
FH - Front-High (60-80)	1662.5	N.A.	17.5
FVH - Front-Very High (80-90)	189.2	N.A.	2.0
BL - Back-Low (0-30)	612.7	N.A.	6.4
BM - Back-Medium (30-60)	537.0	N.A.	5.6
BH - Back-High (60-80)	114.5	N.A.	1.2
BVH - Back-Very High (80-90)	13.9	N.A.	0.1
UL - Uplight-Low (90-100)	110.1	N.A.	1.2
UH - Uplight-High (100-180)	143.6	N.A.	1.5
Total	9508.8	N.A.	100.0
BUG Rating	B2-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	2721	2720	2719	2717	2715	2712	2709	2706	2703	2699	2693	2686	2681	2682	2683	2685	2686	2685	2684
5	2673	2666	2657	2646	2617	2600	2607	2711	2821	2905	2836	2748	2681	2760	2874	3000	3094	3166	3206
10	2589	2542	2543	2591	2718	2868	3020	3099	3170	3250	3408	3563	3690	3690	3664	3641	3721	3805	3867
15	2422	2500	2599	2718	2859	3020	3203	3449	3685	3879	3917	3911	3893	3942	4001	4062	4117	4161	4189
20	2319	2497	2693	2909	3170	3432	3675	3852	3995	4109	4186	4250	4312	4414	4518	4615	4692	4747	4774
25	2085	2251	2462	2716	3055	3408	3743	3972	4166	4341	4541	4724	4879	4967	5029	5075	5145	5201	5233
30	1956	2209	2499	2823	3221	3626	4011	4313	4566	4770	4903	5000	5076	5163	5244	5319	5408	5481	5527
35	1809	2226	2616	2977	3296	3596	3889	4213	4527	4817	5042	5240	5420	5625	5806	5946	5986	5987	5968
40	1676	2100	2520	2935	3372	3784	4152	4383	4583	4786	5130	5465	5743	5814	5814	5774	5756	5737	5727
45	1647	2116	2542	2924	3231	3520	3814	4230	4633	4977	5130	5201	5212	5194	5149	5090	5032	4982	4954
50	1481	1882	2277	2665	3059	3437	3792	4135	4423	4632	4661	4620	4540	4493	4444	4398	4357	4327	4313
55	1296	1535	1836	2199	2710	3219	3659	3830	3904	3913	3932	3930	3915	3909	3894	3869	3803	3740	3698
60	1091	1349	1638	1957	2365	2760	3098	3251	3324	3340	3323	3285	3240	3228	3222	3221	3218	3218	3220
65	924	1178	1434	1691	1978	2244	2468	2583	2643	2660	2647	2610	2558	2506	2454	2404	2361	2330	2313
70	735	882	1044	1223	1455	1675	1852	1892	1881	1837	1790	1742	1702	1711	1731	1753	1752	1748	1745
75	531	596	675	769	906	1037	1140	1135	1103	1067	1092	1129	1170	1198	1221	1237	1233	1226	1221
80	414	420	437	464	516	569	614	626	625	616	604	590	577	570	566	564	565	567	569
85	172	183	199	219	247	276	303	322	337	351	363	376	390	410	432	453	473	488	497
90	36.0	57.6	78.2	97.8	116	134	151	159	171	192	242	299	357	405	445	477	490	495	495
95	26.2	37.4	49.3	61.7	72.9	86.1	103	129	159	188	216	239	258	264	266	264	262	259	257
100	33.9	32.9	33.3	35.0	34.1	37.6	48.5	83.0	121	156	167	172	174	183	193	202	207	211	212
105	24.6	20.8	21.1	25.5	37.6	51.1	62.9	64.7	63.7	61.2	60.4	59.9	60.2	61.8	64.5	68.3	74.2	80.7	87.2
110	16.1	13.4	17.1	27.3	52.4	77.7	96.9	86.3	70.2	55.5	63.7	75.9	87.8	87.5	84.4	79.8	76.3	73.7	72.6
115	21.1	13.6	12.9	19.0	37.2	58.2	78.0	88.6	93.0	90.3	71.2	49.1	29.3	26.9	29.6	35.0	38.8	42.2	44.4
120	15.4	7.61	6.38	11.7	27.8	47.4	67.1	79.7	89.2	95.6	98.2	97.8	94.4	86.6	77.6	68.9	63.0	59.6	59.4
125	11.0	4.67	3.76	8.31	21.3	37.5	54.7	68.1	79.7	89.2	95.2	99.1	101	101	100	99.1	97.9	97.0	96.8
130	7.98	1.89	0.62	4.17	15.0	28.8	43.8	56.1	67.6	78.0	86.9	94.1	99.2	100	99.9	98.5	98.0	97.4	97.1
135	1.64	0.54	1.94	5.86	13.1	22.3	32.7	43.6	54.6	65.4	75.1	83.8	90.9	95.4	98.4	100	102	104	104
140	1.43	4.02	7.03	10.5	14.1	18.3	23.3	30.0	37.4	45.1	53.1	60.7	67.6	72.4	76.3	79.8	84.8	88.9	91.2
145	1.46	2.76	4.44	6.50	8.77	11.6	15.0	19.5	24.7	30.4	36.8	43.1	48.9	52.9	56.1	58.6	61.0	62.6	63.2
150	1.51	2.79	3.54	3.75	2.18	1.01	1.17	6.33	12.6	18.9	22.1	24.6	26.9	30.4	33.8	36.9	39.1	40.5	41.0
155	1.63	1.35	1.39	1.76	2.58	3.63	4.82	5.76	6.91	8.40	11.0	13.8	16.5	18.3	19.8	20.8	21.4	21.7	21.7
160	1.80	1.76	1.76	1.80	1.95	2.09	2.17	1.81	1.53	1.51	2.26	3.42	4.96	7.22	9.49	11.4	12.1	12.2	12.1
165	1.95	2.00	2.02	2.03	1.96	1.91	1.90	1.99	2.17	2.44	3.04	3.57	3.85	3.21	2.38	1.58	1.42	1.43	1.55
170	2.11	2.15	2.18	2.19	2.19	2.18	2.16	2.12	2.08	2.03	1.98	1.94	1.92	1.92	1.94	1.97	1.99	2.02	2.05
175	2.23	2.27	2.29	2.30	2.30	2.29	2.27	2.26	2.24	2.22	2.19	2.15	2.11	2.07	2.03	2.00	1.98	1.96	1.97
180	2.48	2.48	2.49	2.48	2.46	2.44	2.42	2.40	2.39	2.37	2.33	2.29	2.26	2.22	2.19	2.16	2.12	2.09	2.06

																		UNIT: cd	
C (DEG) y	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	2685	2686	2685	2683	2682	2681	2686	2693	2699	2703	2706	2709	2712	2715	2717	2719	2720	2721	2702
5	3166	3094	3000	2874	2760	2681	2748	2836	2905	2821	2711	2607	2600	2617	2646	2657	2666	2673	2489
10	3805	3721	3641	3664	3690	3690	3563	3408	3250	3170	3099	3020	2868	2718	2591	2543	2542	2589	2410
15	4161	4117	4062	4001	3942	3893	3911	3917	3879	3685	3449	3203	3020	2859	2718	2599	2500	2422	2334
20	4747	4692	4615	4518	4414	4312	4250	4186	4109	3995	3852	3675	3432	3170	2909	2693	2497	2319	2342
25	5201	5145	5075	5029	4967	4879	4724	4541	4341	4166	3972	3743	3408	3055	2716	2462	2251	2085	2103
30	5481	5408	5319	5244	5163	5076	5000	4903	4770	4566	4313	4011	3626	3221	2823	2499	2209	1956	2080
35	5987	5986	5946	5806	5625	5420	5240	5042	4817	4527	4213	3889	3596	3296	2977	2616	2226	1809	1857
40	5737	5756	5774	5814	5814	5743	5465	5130	4786	4583	4383	4152	3784	3372	2935	2520	2100	1676	1607
45	4982	5032	5090	5149	5194	5212	5201	5130	4977	4633	4230	3814	3520	3231	2924	2542	2116	1647	1439
50	4327	4357	4398	4444	4493	4540	4620	4661	4632	4423	4135	3792	3437	3059	2665	2277	1882	1481	1144
55	3740	3803	3869	3894	3909	3915	3930	3932	3913	3904	3830	3659	3219	2710	2199	1836	1535	1296	955
60	3218	3218	3221	3222	3228	3240	3285	3323	3340	3324	3251	3098	2760	2365	1957	1638	1349	1091	789
65	2330	2361	2404	2454	2506	2558	2610	2647	2660	2643	2583	2468	2244	1978	1691	1434	1178	924	665
70	1748	1752	1753	1731	1711	1702	1742	1790	1837	1881	1892	1852	1675	1455	1223	1044	882	735	540
75	1226	1233	1237	1221	1198	1170	1129	1092	1067	1103	1135	1140	1037	906	769	675	596	531	388
80	567	565	564	566	570	577	590	604	616	625	626	614	569	516	464	437	420	414	280
85	488	473	453	432	410	390	376	363	351	337	322	303	276	247	219	199	183	172	120
90	495	490	477	445	405	357	299	242	192	171	159	151	134	116	97.8	78.2	57.6	36.0	32.0
95	259	262	264	266	264	258	239	216	188	159	129	103	86.1	72.9	61.7	49.3	37.4	26.2	22.9
100	211	207	202	193	183	174	172	167	156	121	83.0	48.5	37.6	34.1	35.0	33.3	32.9	33.9	26.2
105	80.7	74.2	68.3	64.5	61.8	60.2	59.9	60.4	61.2	63.7	64.7	62.9	51.1	37.6	25.5	21.1	20.8	24.6	19.1
110	73.7	76.3	79.8	84.4	87.5	87.8	75.9	63.7	55.5	70.2	86.3	96.9	77.7	52.4	27.3	17.1	13.4	16.1	11.3
115	42.2	38.8	35.0	29.6	26.9	29.3	49.1	71.2	90.3	93.0	88.6	78.0	58.2	37.2	19.0	12.9	13.6	21.1	14.3
120	59.6	63.0	68.9	77.6	86.6	94.4	97.8	98.2	95.6	89.2	79.7	67.1	47.4	27.8	11.7	6.38	7.61	15.4	11.0
125	97.0	97.9	99.1	100	101	101	99.1	95.2	89.2	79.7	68.1	54.7	37.5	21.3	8.31	3.76	4.67	11.0	8.57
130	97.4	98.0	98.5	99.9	100	99.2	94.1	86.9	78.0	67.6	56.1	43.8	28.8	15.0	4.17	0.62	1.89	7.98	6.71
135	104	102	100	98.4	95.4	90.9	83.8	75.1	65.4	54.6	43.6	32.7	22.3	13.1	5.86	1.94	0.54	1.64	2.33
140	88.9	84.8	79.8	76.3	72.4	67.6	60.7	53.1	45.1	37.4	30.0	23.3	18.3	14.1	10.5	7.03	4.02	1.43	2.59
145	62.6	61.0	58.6	56.1	52.9	48.9	43.1	36.8	30.4	24.7	19.5	15.0	11.6	8.77	6.50	4.44	2.76	1.46	2.33
150	40.5	39.1	36.9	33.8	30.4	26.9	24.6	22.1	18.9	12.6	6.33	1.17	1.01	2.18	3.75	3.54	2.79	1.51	2.17
155	21.7	21.4	20.8	19.8	18.3	16.5	13.8	11.0	8.40	6.91	5.76	4.82	3.63	2.58	1.76	1.39	1.35	1.63	2.32
160	12.2	12.1	11.4	9.49	7.22	4.96	3.42	2.26	1.51	1.53	1.81	2.17	2.09	1.95	1.80	1.76	1.76	1.80	2.56
165	1.43	1.42	1.58	2.38	3.21	3.85	3.57	3.04	2.44	2.17	1.99	1.90	1.91	1.96	2.03	2.02	2.00	1.95	2.69
170	2.02	1.99	1.97	1.94	1.92	1.92	1.94	1.98	2.03	2.08	2.12	2.16	2.18	2.19	2.19	2.18	2.15	2.11	2.69
175	1.96	1.98	2.00	2.03	2.07	2.11	2.15	2.19	2.22	2.24	2.26	2.27	2.29	2.30	2.29	2.27	2.23	2.23	2.67
180	2.09	2.12	2.16	2.19	2.22	2.26	2.29	2.33	2.37	2.39	2.40	2.42	2.44	2.46	2.48	2.49	2.48	2.48	2.44

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	2687	2677	2672	2670	2671	2672	2673	2675	2676	2677	2677	2675	2673	2672	2676	2680	2684	2680	2676
5	2350	2255	2226	2225	2235	2213	2191	2171	2164	2161	2159	2146	2137	2139	2181	2227	2263	2227	2181
10	2278	2193	2184	2200	2220	2180	2129	2077	2046	2020	2001	1987	1976	1968	1956	1947	1942	1947	1956
15	2261	2202	2174	2148	2111	2028	1928	1818	1704	1592	1487	1400	1328	1277	1263	1264	1273	1264	1263
20	2325	2269	2165	2028	1866	1678	1482	1290	1120	971	848	772	722	693	674	667	668	667	674
25	2073	1994	1853	1673	1463	1209	962	750	658	611	595	573	561	557	553	552	553	552	553
30	2090	1985	1684	1330	982	797	669	588	548	531	525	494	463	435	418	408	404	408	418
35	1809	1664	1334	973	647	555	528	530	471	410	353	310	277	251	233	223	220	223	233
40	1493	1333	1078	814	576	474	414	376	310	250	199	170	152	141	134	132	132	132	134
45	1236	1039	834	644	480	377	301	247	198	161	138	132	133	139	138	136	135	136	138
50	870	658	535	454	396	308	229	166	143	133	129	111	93.2	77.6	69.2	64.5	63.1	64.5	69.2
55	683	480	373	313	280	223	174	133	104	82.7	68.2	58.5	52.7	49.8	47.3	46.1	46.1	46.1	47.3
60	547	366	271	218	191	148	113	85.0	64.6	49.9	40.2	34.7	32.0	30.7	27.7	25.4	24.1	25.4	27.7
65	456	297	206	152	122	87.6	62.3	43.9	28.6	17.5	9.83	4.87	2.10	0.91	0.34	0.42	0.84	0.42	0.34
70	379	252	169	113	76.8	45.5	24.3	11.3	3.88	0.91	0.79	0.25	0.51	1.15	1.17	1.16	1.13	1.16	1.17
75	269	174	110	65.1	36.7	19.1	10.3	7.28	3.42	1.53	0.98	0.71	0.92	1.36	1.44	1.49	1.49	1.49	1.44
80	174	95.0	52.2	29.7	20.7	11.3	6.80	5.27	2.98	1.70	1.16	1.02	1.21	1.55	1.67	1.76	1.80	1.76	1.67
85	78.4	46.7	28.2	17.3	11.8	7.30	4.98	4.05	2.71	1.88	1.45	1.38	1.54	1.80	1.95	2.07	2.14	2.07	1.95
90	27.7	23.3	18.1	13.2	8.90	6.39	4.68	3.57	2.68	2.13	1.86	1.81	1.91	2.09	2.22	2.35	2.43	2.35	2.22
95	19.7	16.5	13.2	10.2	7.54	5.76	4.45	3.54	2.92	2.56	2.39	2.32	2.35	2.45	2.61	2.77	2.89	2.77	2.61
100	19.8	14.6	11.0	8.42	6.63	5.24	4.30	3.70	3.23	2.94	2.80	2.75	2.78	2.89	3.08	3.27	3.41	3.27	3.08
105	14.3	10.3	6.95	4.42	2.74	2.41	2.67	3.22	3.39	3.53	3.64	3.61	3.57	3.55	3.72	3.91	4.06	3.91	3.72
110	7.72	5.30	4.71	4.83	5.18	4.44	3.63	3.92	2.79	2.85	3.02	3.15	3.31	3.49	3.69	3.86	3.96	3.86	3.69
115	9.05	5.45	4.20	4.01	4.34	3.81	3.31	2.92	2.87	2.94	3.07	3.12	3.16	3.19	3.22	3.24	3.26	3.24	3.22
120	7.56	5.10	4.01	3.61	3.57	3.19	2.90	2.72	2.76	2.89	3.05	3.11	3.16	3.20	3.23	3.25	3.25	3.25	3.23
125	6.55	5.01	4.07	3.49	3.16	2.86	2.70	2.67	2.77	2.94	3.13	3.23	3.30	3.36	3.40	3.43	3.43	3.43	3.40
130	5.61	4.68	3.91	3.31	2.89	2.72	2.69	2.75	2.85	2.98	3.14	3.31	3.46	3.60	3.67	3.71	3.71	3.71	3.67
135	2.82	3.11	3.10	2.97	2.81	2.80	2.83	2.90	3.04	3.20	3.36	3.49	3.60	3.69	3.75	3.78	3.79	3.78	3.75
140	3.37	3.79	3.61	3.22	2.80	2.79	2.86	2.99	3.09	3.21	3.35	3.53	3.71	3.86	3.92	3.95	3.95	3.95	3.92
145	2.95	3.31	3.28	3.11	2.90	2.93	3.02	3.13	3.23	3.35	3.48	3.65	3.81	3.95	3.99	3.99	3.96	3.99	3.99
150	2.66	2.99	3.06	3.04	2.97	3.06	3.16	3.27	3.34	3.42	3.51	3.64	3.77	3.87	3.87	3.83	3.78	3.83	3.87
155	2.84	3.19	3.31	3.32	3.27	3.25	3.23	3.23	3.29	3.36	3.44	3.54	3.63	3.69	3.65	3.58	3.52	3.58	3.65
160	3.13	3.51	3.62	3.60	3.50	3.43	3.37	3.33	3.36	3.40	3.44	3.42	3.38	3.33	3.31	3.29	3.27	3.29	3.31
165	3.23	3.58	3.65	3.60	3.47	3.43	3.38	3.32	3.26	3.20	3.13	3.03	2.93	2.85	2.84	2.86	2.87	2.86	2.84
170	3.11	3.36	3.39	3.31	3.15	2.99	2.83	2.68	2.62	2.59	2.56	2.50	2.45	2.40	2.37	2.35	2.35	2.35	2.37
175	2.93	3.10	3.11	3.03	2.88	2.70	2.52	2.36	2.33	2.33	2.34	2.27	2.20	2.14	2.15	2.17	2.21	2.17	2.15
180	2.47	2.46	2.47	2.46	2.45	2.41	2.36	2.30	2.24	2.18	2.13	2.10	2.09	2.09	2.10	2.12	2.15	2.12	2.10

																UNIT: cd			
C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	2672	2673	2675	2677	2677	2676	2675	2673	2672	2671	2670	2672	2677	2687	2702				
5	2139	2137	2146	2159	2161	2164	2171	2191	2213	2235	2225	2226	2255	2350	2489				
10	1968	1976	1987	2001	2020	2046	2077	2129	2180	2220	2200	2184	2193	2278	2410				
15	1277	1328	1400	1487	1592	1704	1818	1928	2028	2111	2148	2174	2202	2261	2334				
20	693	722	772	848	971	1120	1290	1482	1678	1866	2028	2165	2269	2325	2342				
25	557	561	573	595	611	658	750	962	1209	1463	1673	1853	1994	2073	2103				
30	435	463	494	525	531	548	588	669	797	982	1330	1684	1985	2090	2080				
35	251	277	310	353	410	471	530	528	555	647	973	1334	1664	1809	1857				
40	141	152	170	199	250	310	376	414	474	576	814	1078	1333	1493	1607				
45	139	133	132	138	161	198	247	301	377	480	644	834	1039	1236	1439				
50	77.6	93.2	111	129	133	143	166	229	308	396	454	535	658	870	1144				
55	49.8	52.7	58.5	68.2	82.7	104	133	174	223	280	313	373	480	683	955				
60	30.7	32.0	34.7	40.2	49.9	64.6	85.0	113	148	191	218	271	366	547	789				
65	0.91	2.10	4.87	9.83	17.5	28.6	43.9	62.3	87.6	122	152	206	297	456	665				
70	1.15	0.51	0.25	0.79	0.91	3.88	11.3	24.3	45.5	76.8	113	169	252	379	540				
75	1.36	0.92	0.71	0.98	1.53	3.42	7.28	10.3	19.1	36.7	65.1	110	174	269	388				
80	1.55	1.21	1.02	1.16	1.70	2.98	5.27	6.80	11.3	20.7	29.7	52.2	95.0	174	280				
85	1.80	1.54	1.38	1.45	1.88	2.71	4.05	4.98	7.30	11.8	17.3	28.2	46.7	78.4	120				
90	2.09	1.91	1.81	1.86	2.13	2.68	3.57	4.68	6.39	8.90	13.2	18.1	23.3	27.7	32.0				
95	2.45	2.35	2.32	2.39	2.56	2.92	3.54	4.45	5.76	7.54	10.2	13.2	16.5	19.7	22.9				
100	2.89	2.78	2.75	2.80	2.94	3.23	3.70	4.30	5.24	6.63	8.42	11.0	14.6	19.8	26.2				
105	3.55	3.57	3.61	3.64	3.53	3.39	3.22	2.67	2.41	2.74	4.42	6.95	10.3	14.3	19.1				
110	3.49	3.31	3.15	3.02	2.85	2.79	2.92	3.63	4.44	5.18	4.83	4.71	5.30	7.72	11.3				
115	3.19	3.16	3.12	3.07	2.94	2.87	2.92	3.31	3.81	4.34	4.01	4.20	5.45	9.05	14.3				
120	3.20	3.16	3.11	3.05	2.89	2.76	2.72	2.90	3.19	3.57	3.61	4.01	5.10	7.56	11.0				
125	3.36	3.30	3.23	3.13	2.94	2.77	2.67	2.70	2.86	3.16	3.49	4.07	5.01	6.55	8.57				
130	3.60	3.46	3.31	3.14	2.98	2.85	2.75	2.69	2.72	2.89	3.31	3.91	4.68	5.61	6.71				
135	3.69	3.60	3.49	3.36	3.20	3.04	2.90	2.83	2.80	2.81	2.97	3.10	3.11	2.82	2.33				
140	3.86	3.71	3.53	3.35	3.21	3.09	2.99	2.86	2.79	2.80	3.22	3.61	3.79	3.37	2.59				
145	3.95	3.81	3.65	3.48	3.35	3.23	3.13	3.02	2.93	2.90	3.11	3.28	3.31	2.95	2.33				
150	3.87	3.77	3.64	3.51	3.42	3.34	3.27	3.16	3.06	2.97	3.04	3.06	2.99	2.66	2.17				
155	3.69	3.63	3.54	3.44	3.36	3.29	3.23	3.23	3.25	3.27	3.32	3.31	3.19	2.84	2.32				
160	3.33	3.38	3.42	3.44	3.40	3.36	3.33	3.37	3.43	3.50	3.60	3.62	3.51	3.13	2.56				
165	2.85	2.93	3.03	3.13	3.20	3.26	3.32	3.38	3.43	3.47	3.60	3.65	3.58	3.23	2.69				
170	2.40	2.45	2.50	2.56	2.59	2.62	2.68	2.83	2.99	3.15	3.31	3.39	3.36	3.11	2.69				
175	2.14	2.20	2.27	2.34	2.33	2.33	2.36	2.52	2.70	2.88	3.03	3.11	3.10	2.93	2.64				
180	2.09	2.09	2.10	2.13	2.18	2.24	2.30	2.36	2.41	2.45	2.46	2.47	2.46	2.47	2.47				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	WPX3 @ 65W / 3000K	Sample ID	231020001-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	0.552	65.8	0.993	5.18
277.0	60	0.269	65.1	0.874	12.01

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*****