

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: 2023-11-16
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		10592
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		134.1
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		10329
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	130.7
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		79.0
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.44
			277V	3.37
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.997
			277V	0.954
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3045±175	3117
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		82.3
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		9
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%		2.8%
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		0.660
(Goniophotometer – Section 4.2)		Non-Worst Case		0.296
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		79.0
(Goniophotometer – Section 4.2)		Non-Worst Case		78.1

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-11-02	WPX2 @ 80W / 3000K	231101003-S1
2	Goniophotometer Test	2023-11-02	WPX2 @ 80W / 3000K	231101003-S1
3	THD and PF Test	2023-11-02	WPX2 @ 80W / 3000K	231101003-S1

Remark (If any)

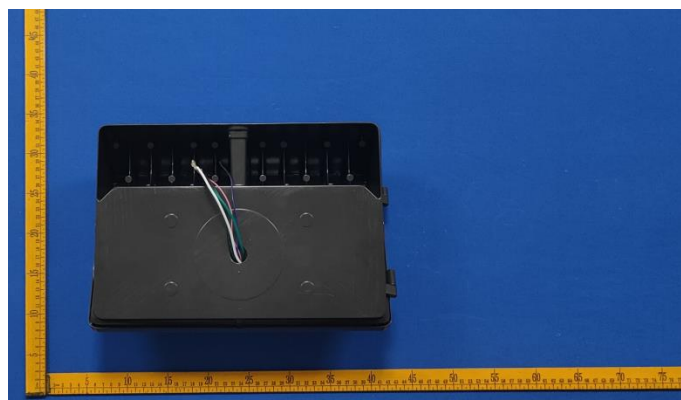
1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

3.0 Product Description

Luminaire Description: Model No. WPX2 @ 80W / 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 @ 80W / 3000K	Sample ID	231101003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

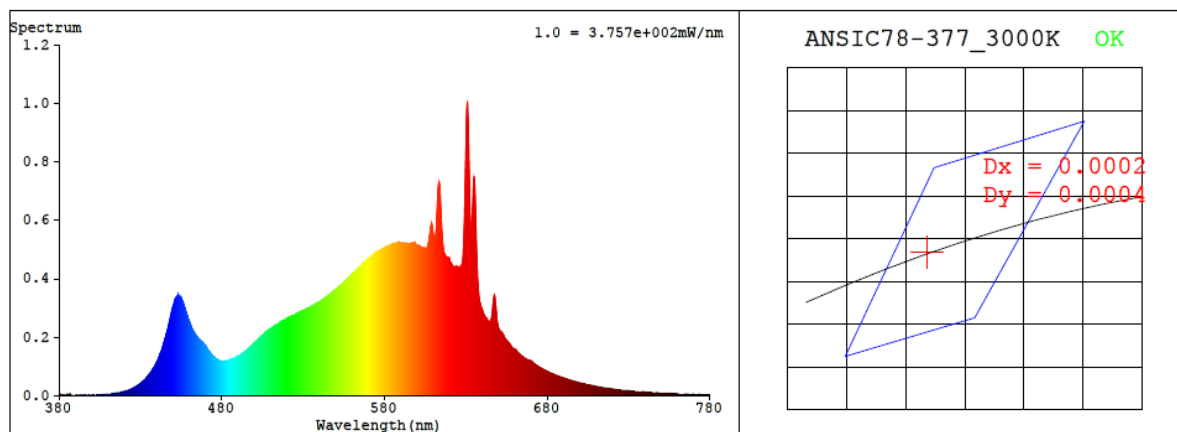
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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.</p> <p>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	0.660	79.0	0.997
277.0	60	0.296	78.1	0.954

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3117	82.3	9	0.0001	84	95	-12%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4290$ $y = 0.4015$ / $u' = 0.2466$ $v' = 0.5192$ ($duv=1.31e-04$)

CCT= 3117K Prcp WL: Ld=582.3nm Purity=49.3%

Peak WL: Lp=631nm FWHM: =8.4nm Ratio:R=22.2% G=75.1% B=2.7%

Render Index: Ra = 82.3 AvgR = 76.2 TM30:Rf=83 Rg=95

EEl: 0.10198 A++ Highest

R1 =80 R2 =90 R3 =97 R4 =79 R5 =80 R6 =88 R7 =83

R8 =60 R9 =9 R10=77 R11=77 R12=67 R13=82 R14=99 R15=74

4.1 Integrating Sphere Test

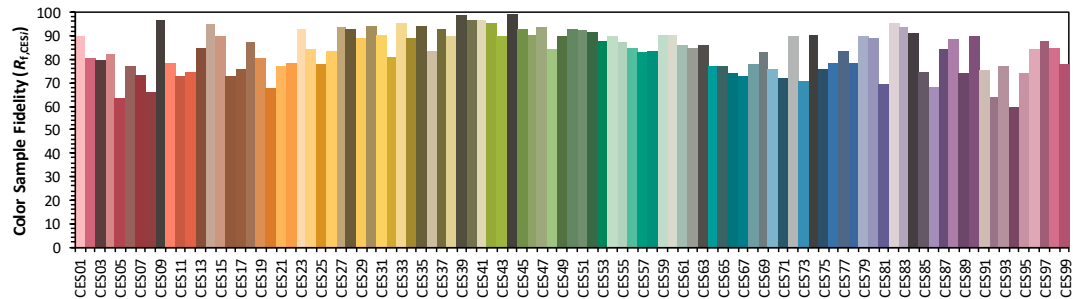
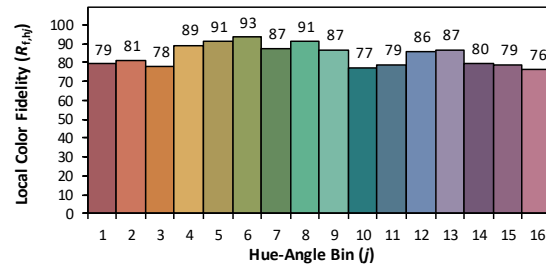
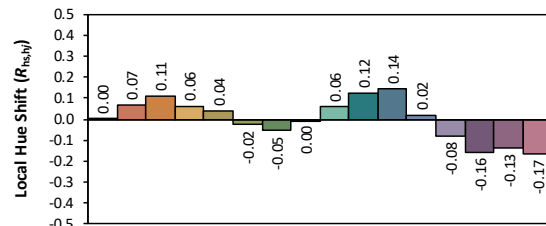
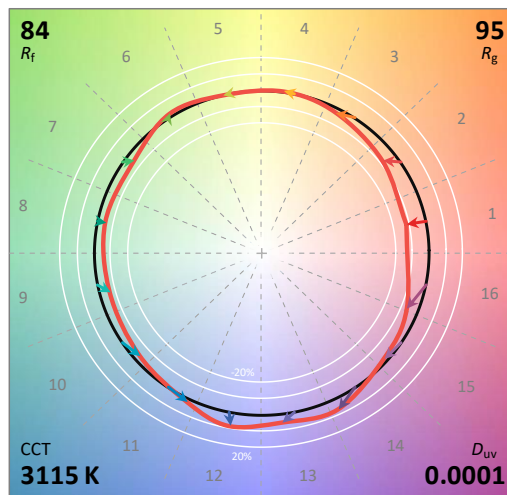
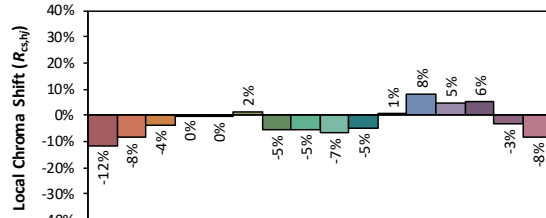
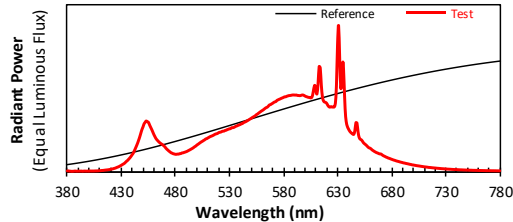
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/11/16

Model: WPX2 @ 80W / 3000K



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

x 0.4291
 y 0.4014
 u' 0.2466
 v' 0.5192

CIE 13.3-1995
(CRI)

R_a 82
 R_g 9

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	2.90E-06	447	2.36E-04	514	2.43E-04	581	5.10E-04	648	3.30E-04	715	2.66E-05
381	3.10E-06	448	2.61E-04	515	2.47E-04	582	5.10E-04	649	2.69E-04	716	2.61E-05
382	1.60E-06	449	2.85E-04	516	2.51E-04	583	5.13E-04	650	2.33E-04	717	2.52E-05
383	1.10E-06	450	3.04E-04	517	2.55E-04	584	5.16E-04	651	2.20E-04	718	2.43E-05
384	0.00E+00	451	3.25E-04	518	2.57E-04	585	5.18E-04	652	2.16E-04	719	2.37E-05
385	4.00E-07	452	3.35E-04	519	2.60E-04	586	5.19E-04	653	2.07E-04	720	2.29E-05
386	8.00E-07	453	3.45E-04	520	2.65E-04	587	5.20E-04	654	1.96E-04	721	2.23E-05
387	2.00E-06	454	3.39E-04	521	2.67E-04	588	5.22E-04	655	1.89E-04	722	2.13E-05
388	1.40E-06	455	3.36E-04	522	2.69E-04	589	5.23E-04	656	1.83E-04	723	2.08E-05
389	1.00E-06	456	3.19E-04	523	2.73E-04	590	5.22E-04	657	1.76E-04	724	2.01E-05
390	1.40E-06	457	3.03E-04	524	2.75E-04	591	5.22E-04	658	1.68E-04	725	1.94E-05
391	1.50E-06	458	2.88E-04	525	2.76E-04	592	5.22E-04	659	1.62E-04	726	1.86E-05
392	1.40E-06	459	2.71E-04	526	2.80E-04	593	5.19E-04	660	1.59E-04	727	1.81E-05
393	1.90E-06	460	2.53E-04	527	2.81E-04	594	5.19E-04	661	1.54E-04	728	1.77E-05
394	7.00E-07	461	2.39E-04	528	2.86E-04	595	5.18E-04	662	1.47E-04	729	1.69E-05
395	1.40E-06	462	2.25E-04	529	2.88E-04	596	5.19E-04	663	1.42E-04	730	1.64E-05
396	1.90E-06	463	2.15E-04	530	2.91E-04	597	5.22E-04	664	1.37E-04	731	1.56E-05
397	1.60E-06	464	2.07E-04	531	2.92E-04	598	5.22E-04	665	1.33E-04	732	1.53E-05
398	1.40E-06	465	1.99E-04	532	2.98E-04	599	5.19E-04	666	1.28E-04	733	1.49E-05
399	2.00E-06	466	1.93E-04	533	2.99E-04	600	5.15E-04	667	1.26E-04	734	1.45E-05
400	1.00E-06	467	1.87E-04	534	3.01E-04	601	5.11E-04	668	1.22E-04	735	1.40E-05
401	2.40E-06	468	1.83E-04	535	3.04E-04	602	5.09E-04	669	1.19E-04	736	1.34E-05
402	2.00E-06	469	1.76E-04	536	3.09E-04	603	5.06E-04	670	1.19E-04	737	1.31E-05
403	2.30E-06	470	1.70E-04	537	3.11E-04	604	5.06E-04	671	1.14E-04	738	1.26E-05
404	2.20E-06	471	1.61E-04	538	3.15E-04	605	5.03E-04	672	1.09E-04	739	1.24E-05
405	2.40E-06	472	1.52E-04	539	3.18E-04	606	5.05E-04	673	1.05E-04	740	1.20E-05
406	2.90E-06	473	1.46E-04	540	3.21E-04	607	5.23E-04	674	1.01E-04	741	1.16E-05
407	3.00E-06	474	1.39E-04	541	3.25E-04	608	5.64E-04	675	9.73E-05	742	1.11E-05
408	3.30E-06	475	1.33E-04	542	3.27E-04	609	5.88E-04	676	9.46E-05	743	1.07E-05
409	3.70E-06	476	1.27E-04	543	3.33E-04	610	5.51E-04	677	9.08E-05	744	1.04E-05
410	4.70E-06	477	1.24E-04	544	3.36E-04	611	5.31E-04	678	8.88E-05	745	1.03E-05
411	4.90E-06	478	1.21E-04	545	3.40E-04	612	6.02E-04	679	8.55E-05	746	9.80E-06
412	6.10E-06	479	1.19E-04	546	3.44E-04	613	7.17E-04	680	8.28E-05	747	9.50E-06
413	6.20E-06	480	1.17E-04	547	3.48E-04	614	7.07E-04	681	7.99E-05	748	9.20E-06
414	7.40E-06	481	1.17E-04	548	3.53E-04	615	5.91E-04	682	7.73E-05	749	8.90E-06
415	8.40E-06	482	1.18E-04	549	3.58E-04	616	5.11E-04	683	7.53E-05	750	8.40E-06
416	9.30E-06	483	1.18E-04	550	3.62E-04	617	4.82E-04	684	7.24E-05	751	8.20E-06
417	1.00E-05	484	1.21E-04	551	3.67E-04	618	4.74E-04	685	7.01E-05	752	8.00E-06
418	1.12E-05	485	1.22E-04	552	3.72E-04	619	4.72E-04	686	6.83E-05	753	7.90E-06
419	1.22E-05	486	1.26E-04	553	3.76E-04	620	4.65E-04	687	6.62E-05	754	7.70E-06
420	1.43E-05	487	1.27E-04	554	3.81E-04	621	4.52E-04	688	6.39E-05	755	7.20E-06
421	1.54E-05	488	1.29E-04	555	3.88E-04	622	4.43E-04	689	6.19E-05	756	7.00E-06
422	1.69E-05	489	1.32E-04	556	3.92E-04	623	4.39E-04	690	6.03E-05	757	7.00E-06
423	1.93E-05	490	1.35E-04	557	3.99E-04	624	4.43E-04	691	5.78E-05	758	6.70E-06
424	2.12E-05	491	1.38E-04	558	4.04E-04	625	4.40E-04	692	5.68E-05	759	6.70E-06
425	2.41E-05	492	1.42E-04	559	4.09E-04	626	4.41E-04	693	5.46E-05	760	6.00E-06
426	2.74E-05	493	1.46E-04	560	4.15E-04	627	4.41E-04	694	5.31E-05	761	6.00E-06
427	3.02E-05	494	1.50E-04	561	4.19E-04	628	4.65E-04	695	5.16E-05	762	5.90E-06
428	3.35E-05	495	1.54E-04	562	4.25E-04	629	5.88E-04	696	4.98E-05	763	5.70E-06
429	3.76E-05	496	1.59E-04	563	4.31E-04	630	8.66E-04	697	4.80E-05	764	5.60E-06
430	4.17E-05	497	1.64E-04	564	4.36E-04	631	9.98E-04	698	4.68E-05	765	5.30E-06
431	4.66E-05	498	1.69E-04	565	4.39E-04	632	7.72E-04	699	4.45E-05	766	5.30E-06
432	5.09E-05	499	1.74E-04	566	4.46E-04	633	5.71E-04	700	4.37E-05	767	4.90E-06
433	5.60E-05	500	1.81E-04	567	4.54E-04	634	6.27E-04	701	4.21E-05	768	4.80E-06
434	6.34E-05	501	1.85E-04	568	4.57E-04	635	7.48E-04	702	4.08E-05	769	4.80E-06
435	7.02E-05	502	1.91E-04	569	4.62E-04	636	6.19E-04	703	3.93E-05	770	4.80E-06
436	7.65E-05	503	1.97E-04	570	4.66E-04	637	4.30E-04	704	3.82E-05	771	4.40E-06
437	8.51E-05	504	2.02E-04	571	4.71E-04	638	3.42E-04	705	3.72E-05	772	4.30E-06
438	9.34E-05	505	2.06E-04	572	4.75E-04	639	3.09E-04	706	3.61E-05	773	4.10E-06
439	1.03E-04	506	2.11E-04	573	4.78E-04	640	2.92E-04	707	3.47E-05	774	4.20E-06
440	1.14E-04	507	2.15E-04	574	4.86E-04	641	2.78E-04	708	3.37E-05	775	3.90E-06
441	1.25E-04	508	2.21E-04	575	4.89E-04	642	2.68E-04	709	3.25E-05	776	4.00E-06
442	1.40E-04	509	2.24E-04	576	4.93E-04	643	2.61E-04	710	3.13E-05	777	3.70E-06
443	1.57E-04	510	2.28E-04	577	4.96E-04	644	2.55E-04	711	3.04E-05	778	3.70E-06
444	1.74E-04	511	2.33E-04	578	5.00E-04	645	2.53E-04	712	2.96E-05	779	3.50E-06
445	1.92E-04	512	2.37E-04	579	5.03E-04	646	2.76E-04	713	2.87E-05	780	3.50E-06
446	2.13E-04	513	2.40E-04	580	5.06E-04	647	3.32E-04	714	2.73E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	WPX2 @ 80W / 3000K	Sample ID	231101003-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	0.660	79.0	0.997
NON-WORST CASE	277.0	60	0.296	78.1	0.954

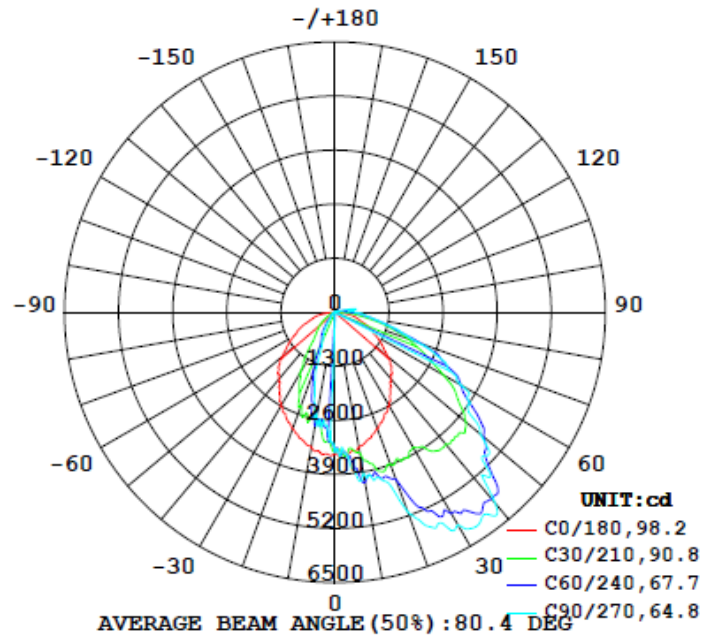
Test Result

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	10592	113.8	147.7	65.2	98.1	134.1	2.7%	B2-U3-G3
0°-90° zones	10329	113.8	147.7	65.2	98.1	130.7	2.8%	B2-U3-G3

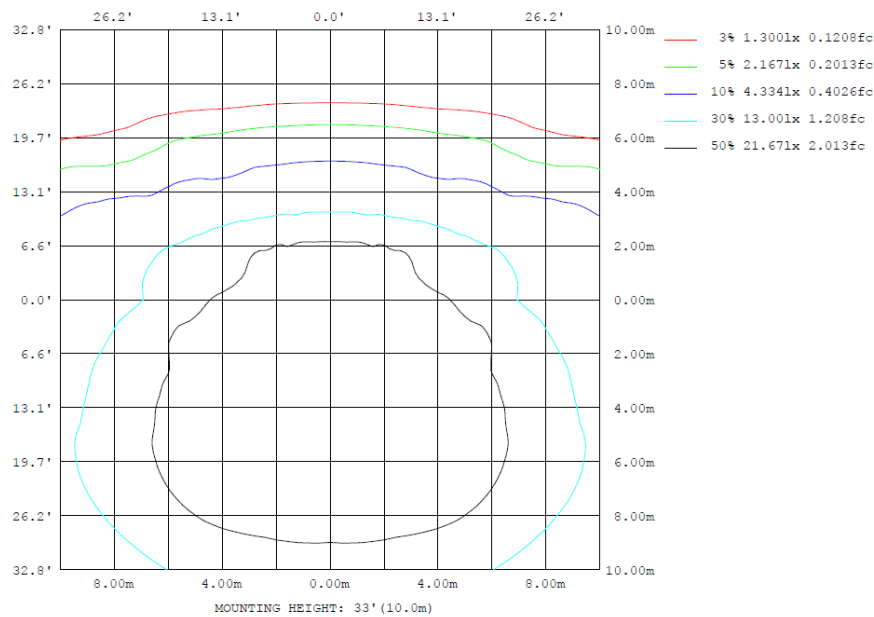
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

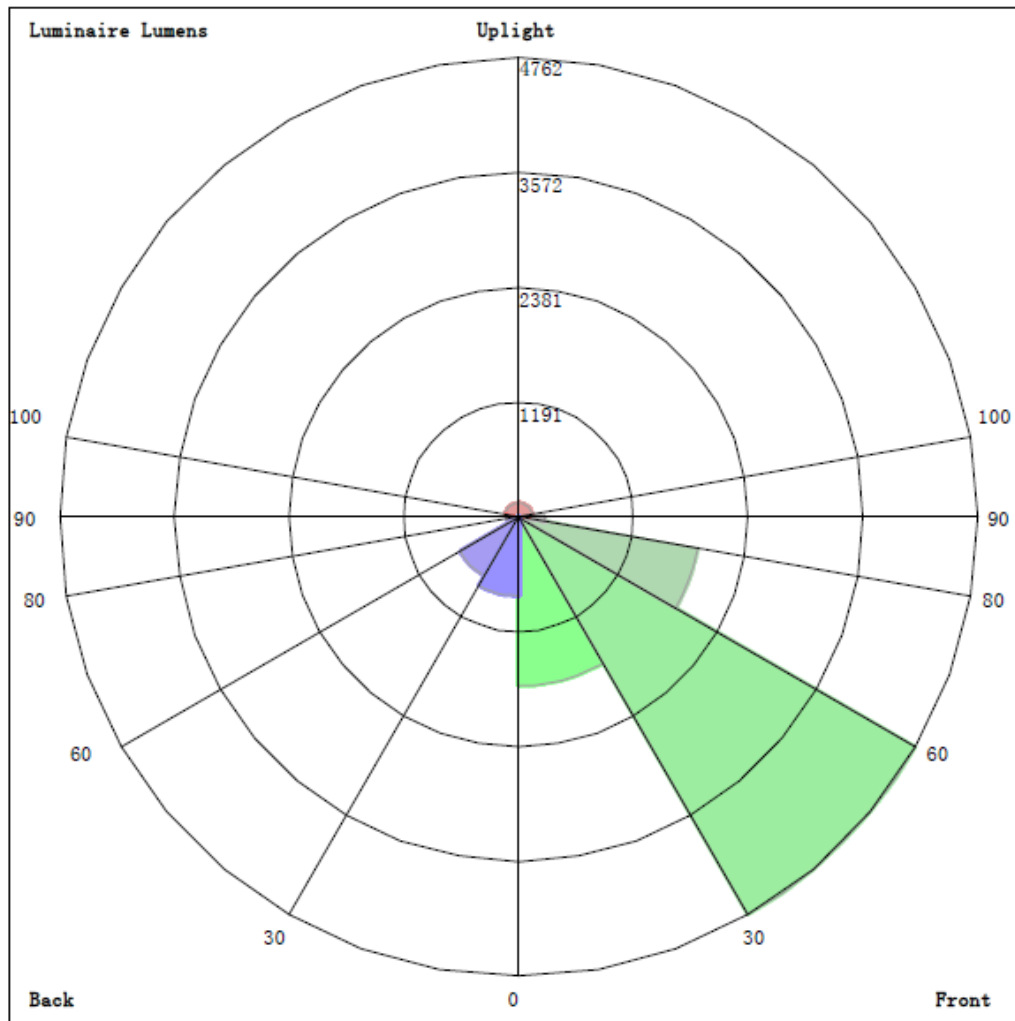
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	3290	3816	3927	3816	3290	2774	2473	2774	0- 10	308.4	308.4	2.91, 2.91
20	2979	4054	5094	4054	2979	1901	1047	1901	10- 20	877.5	1186	11.2, 11.2
30	2622	4975	5898	4975	2622	788.7	499.4	788.7	20- 30	1383	2569	24.3, 24.3
40	2095	5352	5990	5352	2095	464.2	150.2	464.2	30- 40	1817	4386	41.4, 41.4
50	1631	4537	4569	4537	1631	188.9	85.84	188.9	40- 50	1938	6324	59.7, 59.7
60	1150	3370	3480	3370	1150	85.48	32.53	85.48	50- 60	1711	8035	75.9, 75.9
70	712.2	2181	2097	2181	712.2	10.41	1.623	10.41	60- 70	1298	9333	88.1, 88.1
80	373.0	945.7	984.8	945.7	373.0	4.265	2.246	4.265	70- 80	707.5	10040	94.8, 94.8
90	35.16	301.3	495.0	301.3	35.16	2.744	2.597	2.744	80- 90	288.6	10329	97.5, 97.5
100	29.83	126.9	504.2	126.9	29.83	3.514	3.239	3.514	90-100	120.6	10450	98.7, 98.7
110	24.79	27.16	82.09	27.16	24.79	2.735	3.540	2.735	100-110	54.37	10504	99.2, 99.2
120	14.57	83.80	36.53	83.80	14.57	2.661	3.435	2.661	110-120	24.99	10529	99.4, 99.4
130	7.950	69.69	83.39	69.69	7.950	2.863	4.011	2.863	120-130	28.41	10557	99.7, 99.7
140	2.493	42.88	67.46	42.88	2.493	3.172	4.199	3.172	130-140	19.97	10577	99.9, 99.9
150	1.942	20.76	35.15	20.76	1.942	3.583	4.215	3.583	140-150	10.09	10587	100, 100
160	2.007	1.697	13.62	1.697	2.007	3.806	3.753	3.806	150-160	3.527	10591	100, 100
170	2.353	2.233	2.414	2.233	2.353	3.119	2.921	3.119	160-170	0.9658	10592	100, 100
180	2.849	2.749	2.278	2.749	2.849	2.627	2.490	2.627	170-180	0.2558	10592	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	308.42	0-10	308.42	2.91%
10-20	877.51	0-20	1185.93	11.20%
20-30	1382.95	0-30	2568.88	24.25%
30-40	1816.63	0-40	4385.51	41.40%
40-50	1937.99	0-50	6323.50	59.70%
50-60	1711.05	0-60	8034.55	75.85%
60-70	1298.38	0-70	9332.93	88.11%
70-80	707.49	0-80	10040.42	94.79%
80-90	288.60	0-90	10329.02	97.52%
90-100	120.64	0-100	10449.66	98.66%
100-110	54.37	0-110	10504.03	99.17%
110-120	24.99	0-120	10529.02	99.41%
120-130	28.41	0-130	10557.43	99.67%
130-140	19.97	0-140	10577.40	99.86%
140-150	10.09	0-150	10587.49	99.96%
150-160	3.53	0-160	10591.02	99.99%
160-170	0.97	0-170	10591.99	100.00%
170-180	0.26	0-180	10592.25	100.00%

4.2 Goniophotometer Test

LCS/BUG

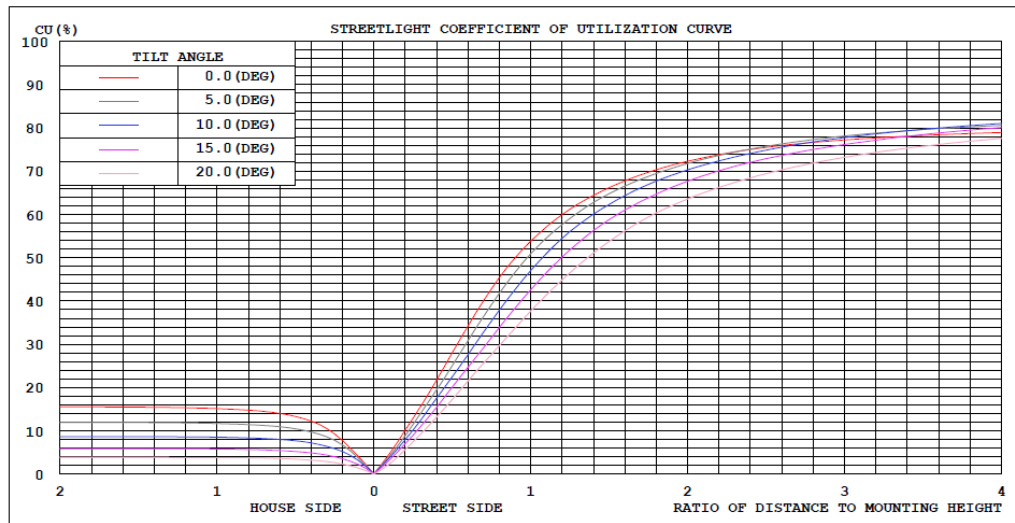


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

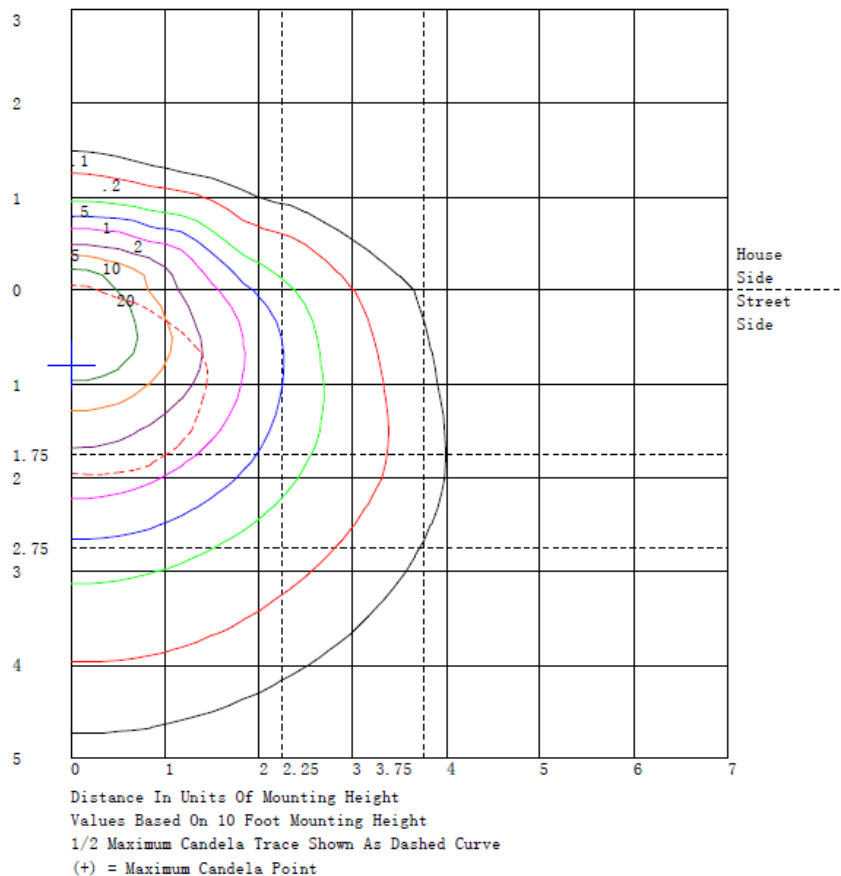
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1751.1	N.A.	16.5
FM - Front-Medium (30-60)	4762.2	N.A.	45.0
FH - Front-High (60-80)	1887.6	N.A.	17.8
FVH - Front-Very High (80-90)	275.7	N.A.	2.6
BL - Back-Low (0-30)	817.8	N.A.	7.7
BM - Back-Medium (30-60)	703.5	N.A.	6.6
BH - Back-High (60-80)	118.2	N.A.	1.1
BVH - Back-Very High (80-90)	12.9	N.A.	0.1
UL - Uplight-Low (90-100)	120.6	N.A.	1.1
UH - Uplight-High (100-180)	142.6	N.A.	1.3
Total	10592.2	N.A.	100.0
BUG Rating	B2-U3-G3		

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	3370	3370	3370	3369	3369	3369	3369	3368	3368	3367	3366	3365	3364	3363	3362	3362	3361	3361	3361
5	3438	3381	3345	3330	3356	3388	3412	3368	3320	3286	3335	3400	3461	3466	3456	3441	3439	3438	3439
10	3290	3262	3254	3267	3297	3349	3425	3544	3677	3816	3959	4080	4161	4131	4068	3993	3958	3936	3927
15	3155	3146	3192	3293	3503	3728	3928	3973	3977	3966	4013	4060	4099	4093	4078	4064	4086	4109	4125
20	2979	3031	3122	3253	3464	3685	3885	3967	4017	4054	4104	4172	4273	4479	4698	4901	5012	5076	5094
25	2798	2992	3181	3364	3545	3718	3882	3997	4127	4295	4627	4974	5289	5425	5503	5549	5631	5696	5731
30	2622	3018	3331	3561	3620	3662	3753	4126	4554	4975	5234	5436	5593	5729	5831	5898	5920	5917	5898
35	2321	2703	3050	3361	3609	3841	4079	4387	4710	5035	5363	5661	5910	6045	6122	6155	6159	6142	6112
40	2095	2495	2871	3224	3528	3827	4140	4561	4977	5352	5576	5737	5854	5973	6058	6108	6085	6040	5990
45	1909	2234	2581	2951	3368	3788	4194	4568	4888	5134	5218	5237	5222	5255	5273	5267	5176	5078	4999
50	1631	1946	2300	2693	3191	3678	4105	4324	4460	4537	4604	4646	4669	4696	4709	4705	4663	4613	4569
55	1380	1667	1987	2340	2776	3207	3594	3836	4003	4104	4137	4127	4088	4042	3990	3941	3924	3914	3903
60	1150	1486	1812	2127	2452	2750	3006	3171	3289	3370	3419	3455	3490	3583	3666	3719	3650	3561	3480
65	946	1251	1529	1781	2004	2202	2379	2548	2692	2804	2853	2875	2884	2911	2936	2955	2965	2967	2963
70	712	874	1049	1237	1461	1682	1881	2016	2115	2181	2206	2210	2203	2213	2216	2211	2173	2131	2097
75	534	596	684	800	974	1151	1307	1369	1398	1408	1421	1431	1442	1471	1499	1520	1519	1509	1495
80	373	379	408	461	552	655	758	836	899	946	960	962	958	966	973	979	985	987	985
85	148	143	157	191	256	331	409	469	523	568	600	625	645	666	684	696	699	698	694
90	35.2	51.4	71.3	94.9	123	154	188	225	263	301	338	374	406	434	457	476	488	494	495
95	27.9	37.3	47.7	59.0	70.5	83.4	98.3	116	137	160	187	217	247	277	304	327	341	349	351
100	29.8	30.9	32.9	36.0	37.5	42.0	51.3	68.6	93.5	127	175	230	287	345	399	445	477	497	504
105	22.3	22.8	23.5	24.3	23.9	24.5	27.2	36.0	46.4	56.7	62.9	68.2	73.2	78.0	84.1	92.4	109	125	140
110	24.8	17.2	15.1	18.4	33.3	48.9	60.8	50.3	37.1	27.2	40.1	57.3	74.1	77.4	77.5	76.3	78.6	80.7	82.1
115	21.4	13.4	11.1	14.5	27.9	43.7	58.6	65.6	68.0	65.2	50.3	34.3	21.9	27.7	38.5	51.1	60.0	66.3	68.7
120	14.6	8.27	7.30	11.7	24.7	40.6	56.9	68.2	77.2	83.8	88.4	89.6	86.7	74.2	59.7	45.9	39.2	36.0	36.5
125	10.8	5.64	5.18	9.46	21.0	35.4	50.7	63.1	74.1	83.3	89.8	94.0	96.1	94.8	92.0	88.4	84.8	81.7	79.9
130	7.95	4.34	4.42	8.18	17.5	29.1	41.6	51.7	61.2	69.7	77.4	83.6	88.0	89.0	88.4	87.0	85.4	84.1	83.4
135	2.59	0.00	0.00	1.22	10.2	21.3	33.1	41.6	49.4	56.7	64.5	71.4	76.8	78.5	78.9	78.4	78.5	78.5	78.5
140	2.49	4.37	6.94	10.2	14.3	18.9	24.2	30.3	36.6	42.9	48.7	53.9	58.4	61.2	63.1	64.5	66.0	67.0	67.5
145	2.45	2.85	4.02	5.96	8.82	12.3	16.4	21.2	26.1	30.8	34.6	37.9	40.9	43.5	45.7	47.6	49.7	51.3	52.2
150	1.94	1.97	1.98	1.99	1.06	0.82	1.97	7.65	14.3	20.8	24.0	26.2	27.8	29.6	31.0	32.3	33.6	34.6	35.1
155	1.82	1.79	1.86	2.03	1.95	2.22	3.08	5.60	8.60	11.7	14.2	16.4	18.2	19.5	20.5	21.2	22.1	22.7	23.1
160	2.01	1.91	1.89	1.94	2.17	2.39	2.54	1.97	1.58	1.70	3.57	5.92	8.37	10.1	11.6	12.7	13.3	13.6	13.6
165	2.17	2.18	2.19	2.18	2.10	2.06	2.07	2.28	2.56	2.89	3.36	3.74	3.89	3.31	2.56	1.86	1.71	1.71	1.82
170	2.35	2.37	2.37	2.37	2.36	2.35	2.32	2.29	2.26	2.23	2.20	2.19	2.18	2.21	2.25	2.30	2.33	2.37	2.41
175	2.54	2.55	2.57	2.57	2.57	2.56	2.55	2.53	2.51	2.49	2.47	2.44	2.41	2.38	2.34	2.30	2.26	2.22	2.20
180	2.85	2.89	2.91	2.92	2.90	2.87	2.83	2.81	2.78	2.75	2.69	2.62	2.56	2.55	2.54	2.52	2.43	2.34	2.28

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	3361	3361	3362	3362	3363	3364	3365	3366	3367	3368	3368	3369	3369	3369	3369	3370	3370	3370	3372	
5	3438	3439	3441	3456	3466	3461	3400	3335	3286	3320	3368	3412	3388	3356	3330	3345	3381	3438	3283	
10	3936	3958	3993	4068	4131	4161	4080	3959	3816	3677	3544	3425	3349	3297	3267	3254	3262	3290	3196	
15	4109	4086	4064	4078	4093	4099	4060	4013	3966	3977	3973	3928	3728	3503	3293	3192	3146	3155	2904	
20	5076	5012	4901	4698	4479	4273	4172	4104	4054	4017	3967	3885	3685	3464	3253	3122	3031	2979	2723	
25	5696	5631	5549	5503	5425	5289	4974	4627	4295	4127	3997	3882	3718	3545	3364	3181	2992	2798	2715	
30	5917	5920	5898	5831	5729	5593	5436	5234	4975	4554	4126	3753	3662	3620	3561	3331	3018	2622	2544	
35	6142	6159	6155	6122	6045	5910	5661	5363	5035	4710	4387	4079	3841	3609	3361	3050	2703	2321	2357	
40	6040	6085	6108	6058	5973	5854	5737	5576	5352	4977	4561	4140	3827	3528	3224	2871	2459	2095	2142	
45	5078	5176	5267	5273	5255	5222	5237	5218	5134	4888	4568	4194	3788	3368	2951	2581	2234	1909	1855	
50	4613	4663	4705	4709	4696	4669	4646	4604	4537	4460	4324	4105	3678	3191	2693	2300	1946	1631	1477	
55	3914	3924	3941	3990	4042	4088	4127	4137	4104	4003	3836	3594	3207	2776	2340	1987	1667	1380	1146	
60	3561	3650	3719	3666	3583	3490	3455	3419	3370	3289	3171	3006	2750	2452	2127	1812	1486	1150	870	
65	2967	2965	2955	2936	2911	2884	2875	2853	2804	2692	2548	2379	2202	2004	1781	1529	1251	946	693	
70	2131	2173	2211	2216	2213	2203	2210	2206	2181	2115	2016	1881	1682	1461	1237	1049	874	712	537	
75	1509	1519	1520	1499	1471	1442	1431	1421	1408	1398	1369	1307	1151	974	800	684	596	534	383	
80	987	985	979	973	966	958	962	960	946	899	836	758	655	552	461	408	379	373	254	
85	698	699	696	684	666	645	625	600	568	523	469	409	331	256	191	157	143	148	107	
90	494	488	476	457	434	406	374	338	301	263	225	188	154	123	94.9	71.3	51.4	35.2	32.2	
95	349	341	327	304	277	247	217	187	160	137	116	98.3	83.4	70.5	59.0	47.7	37.3	27.9	24.3	
100	497	477	445	399	345	287	230	175	127	93.5	68.6	51.3	42.0	37.5	36.0	32.9	30.9	29.8	23.6	
105	125	109	92.4	84.1	78.0	73.2	68.2	62.9	56.7	46.4	36.0	27.2	24.5	23.9	24.3	23.5	22.8	22.3	17.2	
110	80.7	78.6	76.3	77.5	77.4	74.1	57.3	40.1	27.2	37.1	50.3	60.8	48.9	33.3	18.4	15.1	17.2	24.8	17.4	
115	66.3	60.0	51.1	38.5	27.7	21.9	34.3	50.3	65.2	68.0	65.6	58.6	43.7	27.9	14.5	11.1	13.4	21.4	15.1	
120	36.0	39.2	45.9	59.7	74.2	86.7	89.6	88.4	83.8	77.2	68.2	56.9	40.6	24.7	11.7	7.30	8.27	14.6	11.1	
125	81.7	84.8	88.4	92.0	94.8	96.1	94.0	89.8	83.3	74.1	63.1	50.7	35.4	21.0	9.46	5.18	5.64	10.8	8.53	
130	84.1	85.4	87.0	88.4	89.0	88.0	83.6	77.4	69.7	61.2	51.7	41.6	29.1	17.5	8.18	4.42	4.34	7.95	6.47	
135	78.5	78.5	78.4	78.9	78.5	76.8	71.4	64.5	56.7	49.4	41.6	33.1	21.3			10.2	1.22	0.00	2.59	3.32
140	67.0	66.0	64.5	63.1	61.2	58.4	53.9	48.7	42.9	36.6	30.3	24.2	18.9	14.3	10.2	6.94	4.37	2.49	2.25	
145	51.3	49.7	47.6	45.7	43.5	40.9	37.9	34.6	30.8	26.1	21.2	16.4	12.3	8.82	5.96	4.02	2.85	2.45	2.71	
150	34.6	33.6	32.3	31.0	29.6	27.8	26.2	24.0	20.8	14.3	7.65	1.97	0.82	1.06	1.99	1.98	1.97	1.94	2.45	
155	22.7	22.1	21.2	20.5	19.5	18.2	16.4	14.2	11.7	8.60	5.60	3.08	2.22	1.95	2.03	1.86	1.79	1.82	2.45	
160	13.6	13.3	12.7	11.6	10.1	8.37	5.92	3.57	1.70	1.58	1.97	2.54	2.39	2.17	1.94	1.89	1.91	2.01	2.85	
165	1.71	1.71	1.86	2.56	3.31	3.89	3.74	3.36	2.89	2.56	2.28	2.07	2.06	2.10	2.18	2.19	2.18	2.17	3.06	
170	2.37	2.33	2.30	2.25	2.21	2.18	2.19	2.20	2.23	2.26	2.29	2.32	2.35	2.36	2.37	2.37	2.37	2.37	3.06	
175	2.22	2.26	2.30	2.34	2.38	2.42	2.44	2.47	2.49	2.51	2.53	2.55	2.56	2.57	2.57	2.57	2.55	2.54	2.59	
180	2.34	2.43	2.52	2.54	2.55	2.56	2.62	2.69	2.75	2.78	2.81	2.83	2.87	2.90	2.92	2.91	2.89	2.85	2.92	

Table--3

UNIT: cd

C (DBG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
y	0	3373	3373	3373	3371	3369	3368	3366	3364	3363	3362	3361	3361	3361	3362	3362	3361	3361	3362
5	3168	3093	3093	3107	3107	2992	2865	2752	2739	2753	2779	2777	2773	2767	2757	2749	2746	2749	2757
10	3101	3005	2890	2787	2711	2713	2739	2774	2789	2791	2777	2721	2654	2586	2535	2496	2473	2496	2535
15	2715	2588	2552	2556	2577	2572	2554	2516	2422	2312	2199	2106	2026	1961	1921	1898	1892	1898	1921
20	2530	2399	2384	2392	2387	2245	2075	1901	1793	1697	1602	1473	1346	1230	1141	1079	1047	1079	1141
25	2615	2497	2362	2209	2038	1836	1623	1407	1182	978	813	749	724	722	703	691	685	691	703
30	2434	2290	2111	1901	1662	1350	1047	789	693	653	643	602	565	536	516	504	499	504	516
35	2300	2149	1838	1483	1135	920	755	632	544	482	437	389	350	319	299	287	284	287	299
40	2080	1910	1538	1126	744	593	510	464	384	313	254	213	184	166	155	150	150	150	155
45	1734	1547	1231	897	589	443	353	298	236	189	156	141	135	135	129	125	123	125	129
50	1307	1120	892	667	464	339	249	189	152	131	122	108	98.6	92.1	88.0	86.1	85.8	86.1	88.0
55	935	748	584	445	330	244	181	136	106	87.4	77.7	70.5	67.0	65.8	63.7	62.4	61.8	62.4	63.7
60	640	460	344	265	212	158	116	85.5	66.0	54.2	47.9	43.0	40.4	39.1	36.1	33.8	32.5	33.8	36.1
65	486	326	228	165	127	90.6	64.3	45.7	28.9	16.4	7.89	3.32	1.30	0.96	0.61	0.80	1.26	0.80	0.61
70	389	269	183	121	77.2	44.4	23.0	10.4	3.23	0.67	0.94	0.39	0.56	1.12	1.27	1.44	1.62	1.44	1.27
75	260	164	102	61.6	37.4	19.9	10.3	6.19	2.64	1.22	1.15	0.84	0.93	1.25	1.46	1.71	1.96	1.71	1.46
80	160	89.4	50.9	30.3	21.5	11.9	6.62	4.27	2.29	1.48	1.42	1.21	1.25	1.44	1.69	1.97	2.25	1.97	1.69
85	72.6	46.2	29.9	19.4	13.2	8.02	4.82	3.10	2.02	1.64	1.69	1.56	1.57	1.69	1.91	2.16	2.41	2.16	1.91
90	28.7	24.6	19.3	13.9	9.08	6.13	4.06	2.74	2.10	1.91	1.98	1.92	1.93	2.02	2.19	2.39	2.60	2.39	2.19
95	20.7	17.3	13.6	10.2	7.17	5.16	3.71	2.77	2.34	2.22	2.28	2.25	2.27	2.34	2.46	2.62	2.79	2.62	2.46
100	18.3	13.9	10.6	8.01	6.13	4.83	4.00	3.51	3.21	3.07	3.04	2.94	2.88	2.88	2.95	3.07	3.24	3.07	2.95
105	12.8	9.12	6.10	3.85	2.41	2.31	2.74	3.38	3.44	3.41	3.35	3.30	3.27	3.27	3.33	3.45	3.60	3.45	3.33
110	11.5	7.26	5.16	4.20	3.92	3.31	2.92	2.73	2.82	3.02	3.26	3.34	3.39	3.43	3.46	3.50	3.54	3.50	3.46
115	10.2	6.55	4.64	3.68	3.34	2.93	2.75	2.73	2.77	2.87	2.99	3.04	3.08	3.12	3.17	3.23	3.29	3.23	3.17
120	8.18	5.92	4.43	3.46	2.90	2.62	2.57	2.66	2.76	2.90	3.04	3.12	3.18	3.23	3.31	3.38	3.43	3.38	3.31
125	6.61	5.08	3.99	3.24	2.78	2.60	2.60	2.72	2.86	3.03	3.20	3.29	3.35	3.41	3.51	3.60	3.67	3.60	3.51
130	5.23	4.22	3.48	2.97	2.66	2.61	2.70	2.86	2.97	3.10	3.24	3.39	3.54	3.68	3.82	3.93	4.01	3.93	3.82
135	3.63	3.78	3.49	3.09	2.71	2.72	2.83	3.01	3.16	3.31	3.46	3.58	3.69	3.80	3.91	4.00	4.07	4.00	3.91
140	3.21	3.35	3.25	3.07	2.90	2.95	3.04	3.17	3.28	3.38	3.50	3.63	3.75	3.88	4.01	4.12	4.20	4.12	4.01
145	3.01	3.17	3.21	3.19	3.17	3.22	3.29	3.38	3.49	3.62	3.73	3.81	3.88	3.95	4.08	4.19	4.28	4.19	4.08
150	2.89	3.18	3.30	3.35	3.36	3.43	3.51	3.58	3.65	3.72	3.78	3.82	3.87	3.93	4.03	4.13	4.22	4.13	4.03
155	3.18	3.58	3.74	3.77	3.72	3.70	3.66	3.63	3.65	3.69	3.75	3.83	3.91	3.97	3.95	3.92	3.88	3.92	3.95
160	3.51	3.94	4.08	4.08	3.98	3.93	3.86	3.81	3.81	3.81	3.82	3.77	3.72	3.68	3.70	3.73	3.75	3.73	3.70
165	3.63	4.04	4.13	4.08	3.94	3.87	3.79	3.72	3.69	3.66	3.61	3.49	3.37	3.28	3.31	3.36	3.41	3.36	3.31
170	3.47	3.75	3.79	3.69	3.53	3.39	3.25	3.12	3.07	3.04	3.02	2.98	2.95	2.92	2.91	2.92	2.92	2.92	2.91
175	3.28	3.46	3.50	3.43	3.31	3.14	2.96	2.80	2.78	2.79	2.80	2.73	2.65	2.59	2.61	2.65	2.70	2.65	2.61
180	2.83	2.82	2.81	2.80	2.78	2.73	2.68	2.63	2.57	2.51	2.45	2.41	2.39	2.38	2.41	2.45	2.49	2.45	2.41

C (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
y (DEG)	0	3362	3361	3361	3361	3362	3363	3364	3366	3368	3369	3371	3373	3373	3372				
5	2767	2773	2777	2779	2753	2739	2752	2865	2992	3107	3107	3093	3093	3168	3283				
10	2586	2654	2721	2777	2791	2789	2774	2739	2713	2711	2787	2890	3005	3101	3196				
15	1961	2026	2106	2199	2312	2422	2516	2554	2572	2577	2556	2552	2588	2715	2904				
20	1230	1346	1473	1602	1697	1793	1901	2075	2245	2387	2392	2384	2399	2530	2723				
25	722	724	749	813	978	1182	1407	1623	1836	2038	2209	2362	2497	2615	2715				
30	536	565	602	643	653	693	789	1047	1350	1662	1901	2111	2290	2434	2544				
35	319	350	389	437	482	544	632	755	920	1135	1483	1838	2149	2300	2357				
40	166	184	213	254	313	384	464	510	593	744	1126	1538	1910	2080	2142				
45	135	135	141	156	189	236	298	353	443	589	897	1231	1547	1734	1855				
50	92.1	98.6	108	122	131	152	189	249	339	464	667	892	1120	1307	1477				
55	65.8	67.0	70.5	77.7	87.4	106	136	181	244	330	445	584	748	935	1146				
60	39.1	40.4	43.0	47.9	54.2	66.0	85.5	116	158	212	265	344	460	640	870				
65	0.96	1.30	3.32	7.89	16.4	28.9	45.7	64.3	90.6	127	165	228	326	486	693				
70	1.12	0.56	0.39	0.94	0.67	3.23	10.4	23.0	44.4	77.2	121	183	269	389	537				
75	1.25	0.93	0.84	1.15	1.22	2.64	6.19	10.3	19.9	37.4	61.6	102	164	260	383				
80	1.44	1.25	1.21	1.42	1.48	2.29	4.27	6.62	11.9	21.5	30.3	50.9	89.4	160	254				
85	1.69	1.57	1.56	1.69	1.64	2.02	3.10	4.82	8.02	13.2	19.4	29.9	46.2	72.6	107				
90	2.02	1.93	1.92	1.98	1.91	2.10	2.74	4.06	6.13	9.08	13.9	19.3	24.6	28.7	32.2				
95	2.34	2.27	2.25	2.28	2.22	2.34	2.77	3.71	5.16	7.17	10.2	13.6	17.3	20.7	24.3				
100	2.88	2.88	2.94	3.04	3.07	3.21	3.51	4.00	4.83	6.13	8.01	10.6	13.9	18.3	23.6				
105	3.27	3.27	3.30	3.35	3.41	3.44	3.38	2.74	2.31	2.41	3.85	6.10	9.12	12.8	17.2				
110	3.43	3.39	3.34	3.26	3.02	2.82	2.73	2.92	3.31	3.92	4.20	5.16	7.26	11.5	17.4				
115	3.12	3.08	3.04	2.99	2.87	2.77	2.73	2.75	2.93	3.34	3.68	4.64	6.55	10.2	15.1				
120	3.23	3.18	3.12	3.04	2.90	2.76	2.66	2.57	2.62	2.90	3.46	4.43	5.92	8.18	11.1				
125	3.41	3.35	3.29	3.20	3.03	2.86	2.72	2.60	2.60	2.78	3.24	3.99	5.08	6.61	8.53				
130	3.68	3.54	3.39	3.24	3.10	2.97	2.86	2.70	2.61	2.66	2.97	3.48	4.22	5.23	6.47				
135	3.80	3.69	3.58	3.46	3.31	3.16	3.01	2.83	2.72	2.71	3.09	3.49	3.78	3.63	3.24				
140	3.88	3.75	3.63	3.50	3.38	3.28	3.17	3.04	2.95	2.90	3.07	3.25	3.35	3.21	2.92				
145	3.95	3.88	3.81	3.73	3.62	3.49	3.38	3.29	3.22	3.17	3.19	3.21	3.17	3.01	2.77				
150	3.93	3.87	3.82	3.78	3.72	3.65	3.58	3.51	3.43	3.36	3.35	3.30	3.18	2.89	2.47				
155	3.97	3.91	3.83	3.75	3.69	3.65	3.63	3.66	3.70	3.72	3.77	3.74	3.58	3.18	2.59				
160	3.68	3.72	3.77	3.82	3.81	3.81	3.81	3.86	3.93	3.98	4.08	4.08	3.94	3.51	2.86				
165	3.28	3.37	3.49	3.61	3.66	3.69	3.72	3.79	3.87	3.94	4.08	4.13	4.04	3.63	3.01				
170	2.92	2.95	2.98	3.02	3.04	3.07	3.12	3.25	3.39	3.53	3.69	3.79	3.75	3.47	3.00				
175	2.59	2.65	2.73	2.80	2.79	2.78	2.80	2.96	3.14	3.31	3.43	3.50	3.46	3.28	2.97				
180	2.38	2.39	2.41	2.45	2.51	2.57	2.63	2.68	2.73	2.78	2.80	2.81	2.82	2.83	2.84				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	WPX2 @ 80W / 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	0.660	79.0	0.997	2.44
277.0	60	0.296	78.1	0.954	3.37

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*****