

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: 2023-10-26
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		18635
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		147.8
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		18136
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	143.8
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		126.1
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	4.08
			277V	7.17
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.998
			277V	0.959
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4114
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		85.6
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		19
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		85
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		96
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-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		1.051
(Goniophotometer – Section 4.2)		Non-Worst Case		0.461
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		126.1
(Goniophotometer – Section 4.2)		Non-Worst Case		122.5

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-10-20	WPX3 @ 130W / 4000K	231020001-S1
2	Goniophotometer Test	2023-10-20	WPX3 @ 130W / 4000K	231020001-S1
3	THD and PF Test	2023-10-20	WPX3 @ 130W / 4000K	231020001-S1

Remark (If any)

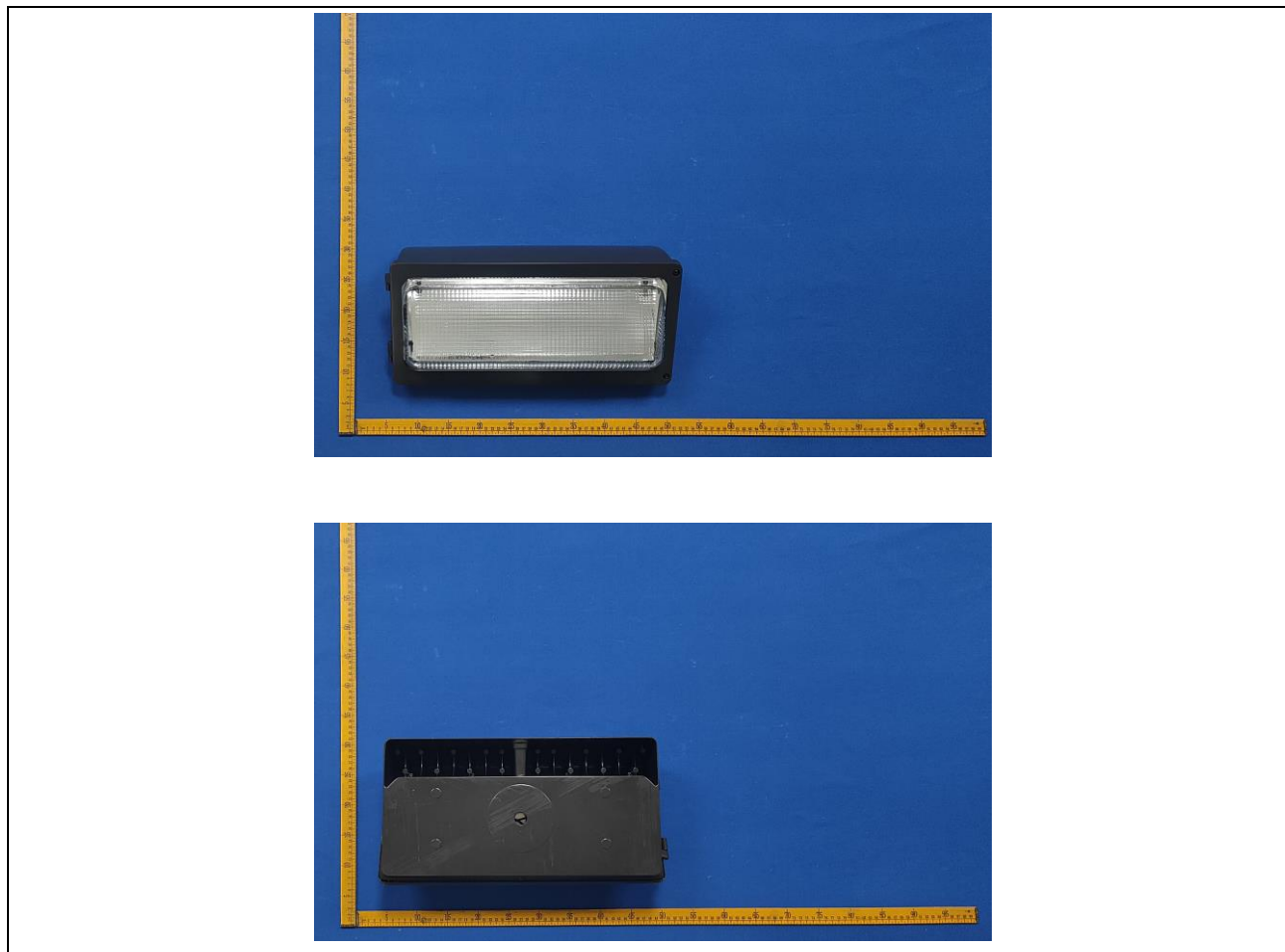
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. WPX3 @ 130W / 4000K, 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 @ 130W / 4000K	Sample ID	231020001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

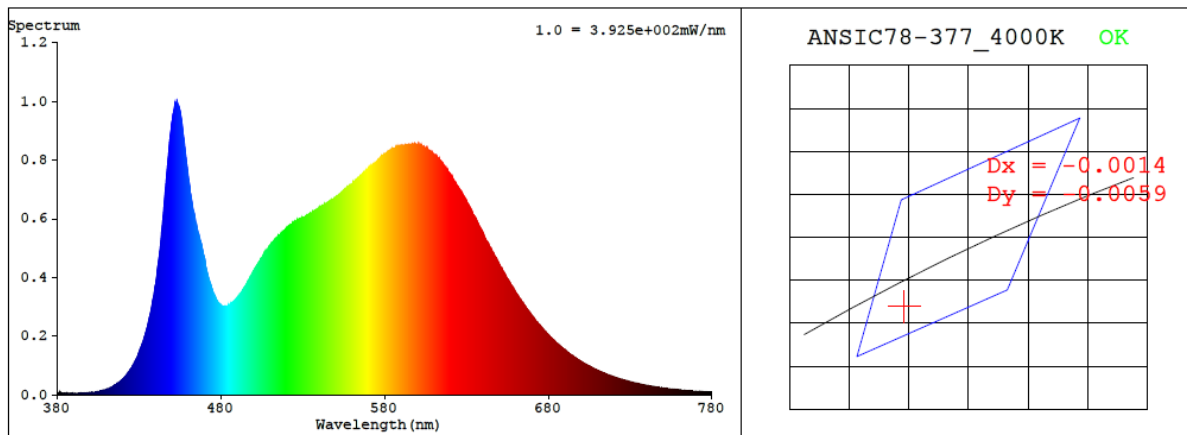
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	1.051	126.1	0.998
277.0	60	0.461	122.5	0.959

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4114	85.6	19	-0.0024	85	96	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3742$ $y = 0.3677$ / $u' = 0.2246$ $v' = 0.4966$ ($duv = -2.40e-03$)

CCT= 4114K Prcp WL: Ld=580.2nm Purity=22.6%

Peak WL: Lp=453nm FWHM: =25.7nm Ratio:R=18.5% G=77.4% B=4.1%

Render Index: Ra = 85.6 AvgR = 80.0 TM30:Rf=85 Rg=96

EEL: 0.09007 A++ Highest

R1 =85 R2 =93 R3 =96 R4 =84 R5 =85 R6 =89 R7 =86
R8 =68 R9 =19 R10=81 R11=83 R12=66 R13=87 R14=98 R15=80

4.1 Integrating Sphere Test

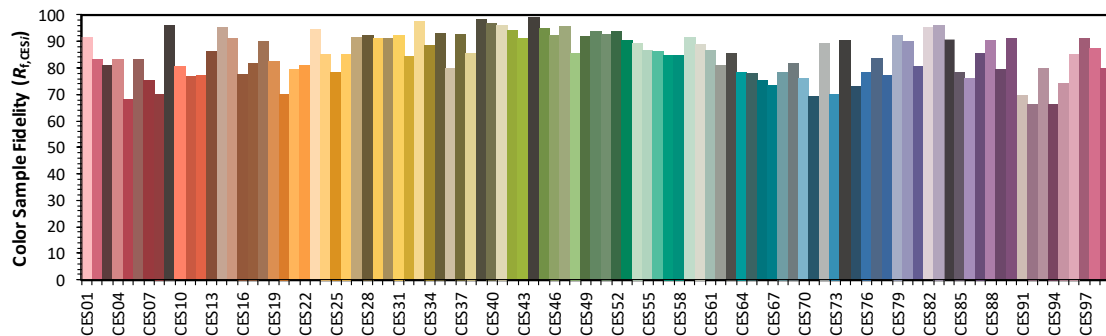
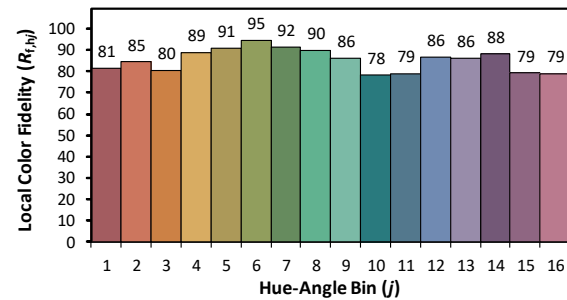
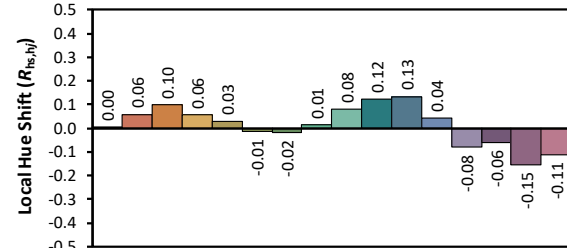
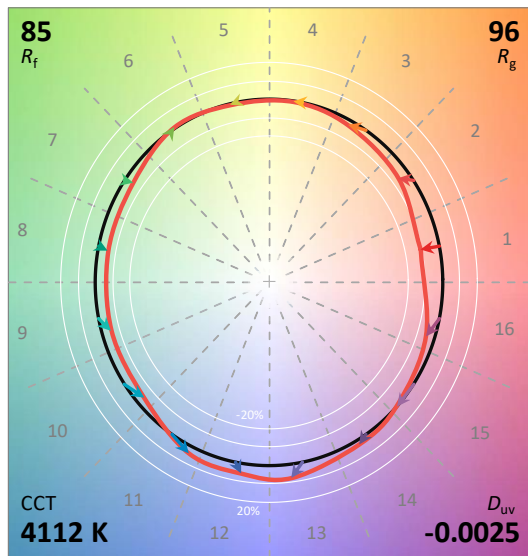
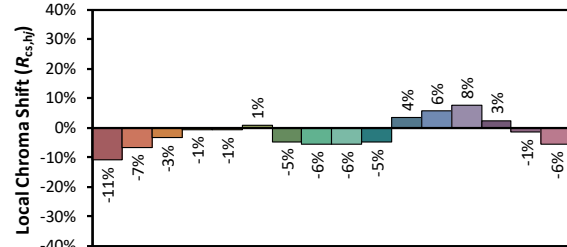
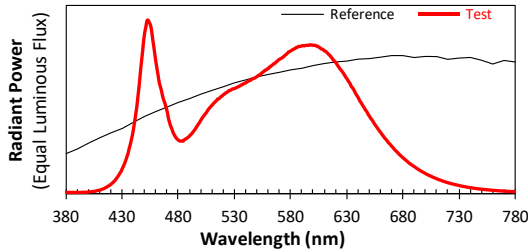
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/10/26

Model: WPX3 @ 130W / 4000K



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

x 0.3741

y 0.3676

u' 0.2246

v' 0.4965

CIE 13.3-1995
(CRI)

R_a 86

R_g 19

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	7.00E-06	447	7.55E-04	514	5.35E-04	581	8.23E-04	648	4.68E-04	715	7.16E-05
381	4.90E-06	448	8.16E-04	515	5.43E-04	582	8.27E-04	649	4.54E-04	716	6.90E-05
382	5.20E-06	449	8.81E-04	516	5.44E-04	583	8.31E-04	650	4.45E-04	717	6.71E-05
383	5.60E-06	450	9.27E-04	517	5.50E-04	584	8.34E-04	651	4.34E-04	718	6.51E-05
384	4.70E-06	451	9.60E-04	518	5.57E-04	585	8.39E-04	652	4.26E-04	719	6.29E-05
385	4.40E-06	452	9.94E-04	519	5.60E-04	586	8.40E-04	653	4.17E-04	720	6.12E-05
386	5.70E-06	453	9.95E-04	520	5.67E-04	587	8.45E-04	654	4.06E-04	721	5.92E-05
387	4.60E-06	454	9.82E-04	521	5.71E-04	588	8.45E-04	655	3.96E-04	722	5.73E-05
388	4.80E-06	455	9.68E-04	522	5.77E-04	589	8.45E-04	656	3.87E-04	723	5.53E-05
389	4.80E-06	456	9.36E-04	523	5.80E-04	590	8.49E-04	657	3.78E-04	724	5.40E-05
390	4.70E-06	457	8.87E-04	524	5.85E-04	591	8.49E-04	658	3.68E-04	725	5.25E-05
391	5.00E-06	458	8.43E-04	525	5.91E-04	592	8.48E-04	659	3.59E-04	726	5.06E-05
392	4.50E-06	459	7.95E-04	526	5.91E-04	593	8.50E-04	660	3.51E-04	727	4.91E-05
393	5.40E-06	460	7.50E-04	527	5.96E-04	594	8.52E-04	661	3.42E-04	728	4.79E-05
394	5.50E-06	461	7.11E-04	528	6.00E-04	595	8.51E-04	662	3.33E-04	729	4.63E-05
395	6.20E-06	462	6.71E-04	529	6.01E-04	596	8.51E-04	663	3.25E-04	730	4.43E-05
396	6.20E-06	463	6.33E-04	530	6.03E-04	597	8.54E-04	664	3.16E-04	731	4.31E-05
397	5.90E-06	464	6.11E-04	531	6.05E-04	598	8.53E-04	665	3.09E-04	732	4.20E-05
398	6.70E-06	465	5.85E-04	532	6.09E-04	599	8.53E-04	666	3.01E-04	733	4.06E-05
399	6.40E-06	466	5.55E-04	533	6.12E-04	600	8.51E-04	667	2.92E-04	734	3.93E-05
400	8.50E-06	467	5.34E-04	534	6.15E-04	601	8.52E-04	668	2.85E-04	735	3.81E-05
401	8.40E-06	468	5.16E-04	535	6.19E-04	602	8.51E-04	669	2.79E-04	736	3.69E-05
402	9.00E-06	469	4.92E-04	536	6.24E-04	603	8.47E-04	670	2.70E-04	737	3.56E-05
403	9.50E-06	470	4.68E-04	537	6.25E-04	604	8.46E-04	671	2.64E-04	738	3.46E-05
404	1.01E-05	471	4.32E-04	538	6.30E-04	605	8.41E-04	672	2.55E-04	739	3.34E-05
405	1.16E-05	472	4.09E-04	539	6.33E-04	606	8.38E-04	673	2.49E-04	740	3.22E-05
406	1.21E-05	473	3.87E-04	540	6.36E-04	607	8.31E-04	674	2.42E-04	741	3.18E-05
407	1.43E-05	474	3.73E-04	541	6.40E-04	608	8.29E-04	675	2.36E-04	742	3.04E-05
408	1.57E-05	475	3.53E-04	542	6.45E-04	609	8.26E-04	676	2.29E-04	743	2.96E-05
409	1.69E-05	476	3.39E-04	543	6.48E-04	610	8.19E-04	677	2.23E-04	744	2.87E-05
410	1.88E-05	477	3.28E-04	544	6.50E-04	611	8.17E-04	678	2.16E-04	745	2.76E-05
411	2.08E-05	478	3.18E-04	545	6.54E-04	612	8.11E-04	679	2.10E-04	746	2.68E-05
412	2.35E-05	479	3.11E-04	546	6.59E-04	613	8.05E-04	680	2.05E-04	747	2.57E-05
413	2.54E-05	480	3.05E-04	547	6.60E-04	614	7.98E-04	681	1.99E-04	748	2.51E-05
414	2.85E-05	481	3.02E-04	548	6.64E-04	615	7.92E-04	682	1.93E-04	749	2.46E-05
415	3.24E-05	482	3.00E-04	549	6.68E-04	616	7.84E-04	683	1.88E-04	750	2.33E-05
416	3.52E-05	483	3.01E-04	550	6.72E-04	617	7.76E-04	684	1.83E-04	751	2.28E-05
417	4.02E-05	484	3.00E-04	551	6.77E-04	618	7.67E-04	685	1.76E-04	752	2.21E-05
418	4.33E-05	485	3.06E-04	552	6.80E-04	619	7.60E-04	686	1.72E-04	753	2.15E-05
419	4.81E-05	486	3.12E-04	553	6.84E-04	620	7.53E-04	687	1.67E-04	754	2.07E-05
420	5.30E-05	487	3.14E-04	554	6.91E-04	621	7.44E-04	688	1.63E-04	755	2.01E-05
421	5.86E-05	488	3.20E-04	555	6.96E-04	622	7.34E-04	689	1.58E-04	756	1.94E-05
422	6.49E-05	489	3.25E-04	556	7.00E-04	623	7.24E-04	690	1.54E-04	757	1.91E-05
423	7.14E-05	490	3.31E-04	557	7.08E-04	624	7.15E-04	691	1.49E-04	758	1.84E-05
424	7.88E-05	491	3.38E-04	558	7.09E-04	625	7.07E-04	692	1.45E-04	759	1.78E-05
425	8.81E-05	492	3.44E-04	559	7.16E-04	626	6.99E-04	693	1.40E-04	760	1.70E-05
426	9.72E-05	493	3.53E-04	560	7.17E-04	627	6.90E-04	694	1.36E-04	761	1.67E-05
427	1.07E-04	494	3.61E-04	561	7.27E-04	628	6.80E-04	695	1.33E-04	762	1.60E-05
428	1.18E-04	495	3.71E-04	562	7.28E-04	629	6.68E-04	696	1.28E-04	763	1.58E-05
429	1.28E-04	496	3.81E-04	563	7.35E-04	630	6.61E-04	697	1.25E-04	764	1.52E-05
430	1.44E-04	497	3.91E-04	564	7.39E-04	631	6.49E-04	698	1.20E-04	765	1.47E-05
431	1.57E-04	498	4.00E-04	565	7.46E-04	632	6.39E-04	699	1.18E-04	766	1.44E-05
432	1.72E-04	499	4.10E-04	566	7.48E-04	633	6.29E-04	700	1.14E-04	767	1.37E-05
433	1.89E-04	500	4.22E-04	567	7.55E-04	634	6.15E-04	701	1.10E-04	768	1.32E-05
434	2.10E-04	501	4.32E-04	568	7.60E-04	635	6.08E-04	702	1.07E-04	769	1.31E-05
435	2.28E-04	502	4.41E-04	569	7.66E-04	636	5.97E-04	703	1.04E-04	770	1.27E-05
436	2.56E-04	503	4.49E-04	570	7.71E-04	637	5.85E-04	704	1.01E-04	771	1.21E-05
437	2.79E-04	504	4.58E-04	571	7.74E-04	638	5.72E-04	705	9.85E-05	772	1.19E-05
438	3.08E-04	505	4.66E-04	572	7.78E-04	639	5.62E-04	706	9.50E-05	773	1.18E-05
439	3.37E-04	506	4.77E-04	573	7.83E-04	640	5.52E-04	707	9.20E-05	774	1.10E-05
440	3.74E-04	507	4.86E-04	574	7.88E-04	641	5.39E-04	708	8.93E-05	775	1.09E-05
441	4.16E-04	508	4.93E-04	575	7.94E-04	642	5.27E-04	709	8.66E-05	776	1.03E-05
442	4.59E-04	509	5.01E-04	576	7.99E-04	643	5.19E-04	710	8.40E-05	777	1.02E-05
443	5.05E-04	510	5.07E-04	577	8.05E-04	644	5.06E-04	711	8.10E-05	778	9.80E-06
444	5.65E-04	511	5.15E-04	578	8.13E-04	645	4.98E-04	712	7.86E-05	779	9.80E-06
445	6.24E-04	512	5.22E-04	579	8.15E-04	646	4.86E-04	713	7.64E-05	780	9.80E-06
446	6.93E-04	513	5.28E-04	580	8.19E-04	647	4.76E-04	714	7.42E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	WPX3 @ 130W / 4000K	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	1.051	126.1	0.998
NON-WORST CASE	277.0	60	0.461	122.5	0.959

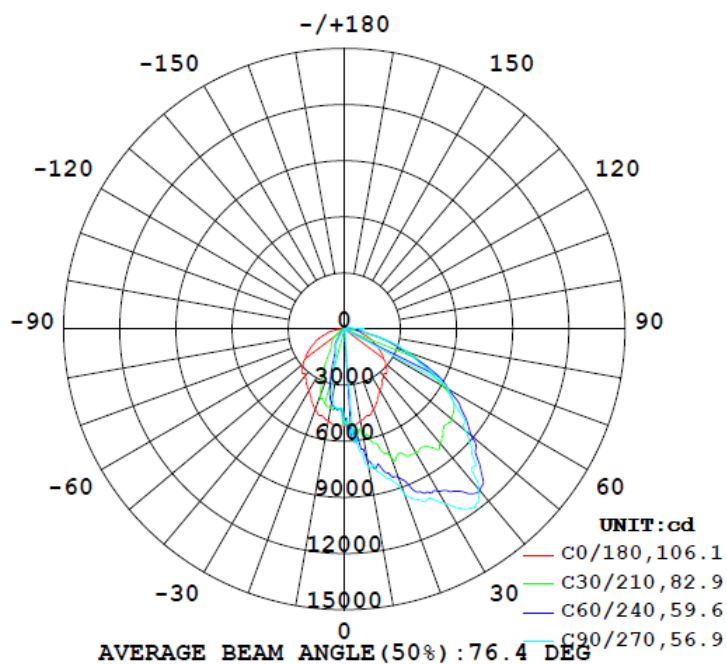
Test Result

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	18635	105.9	147.5	55.9	100.5	147.8	2.2%	B3-U3-G3
0°-90° zones	18136	105.9	147.5	55.9	100.5	143.8	2.2%	B3-U3-G3

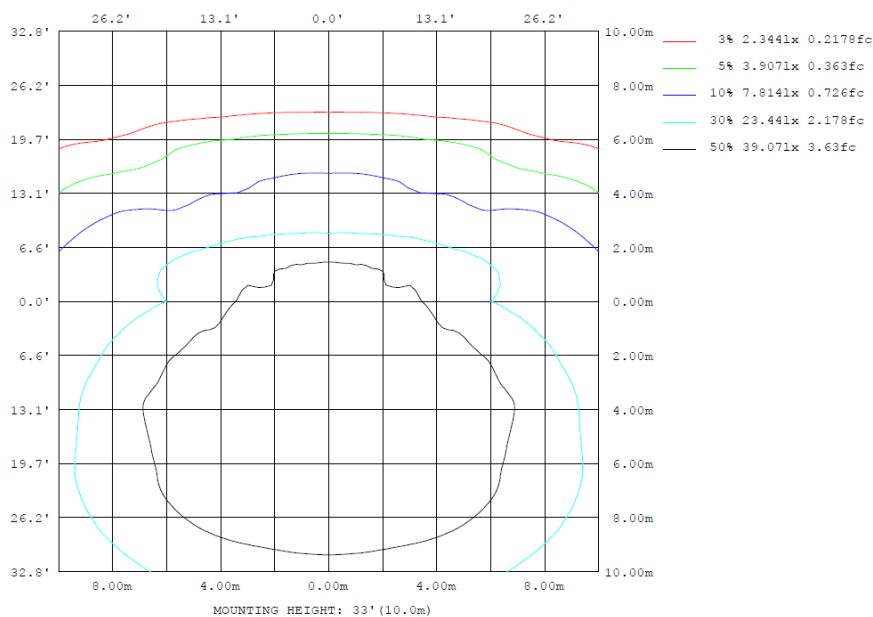
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

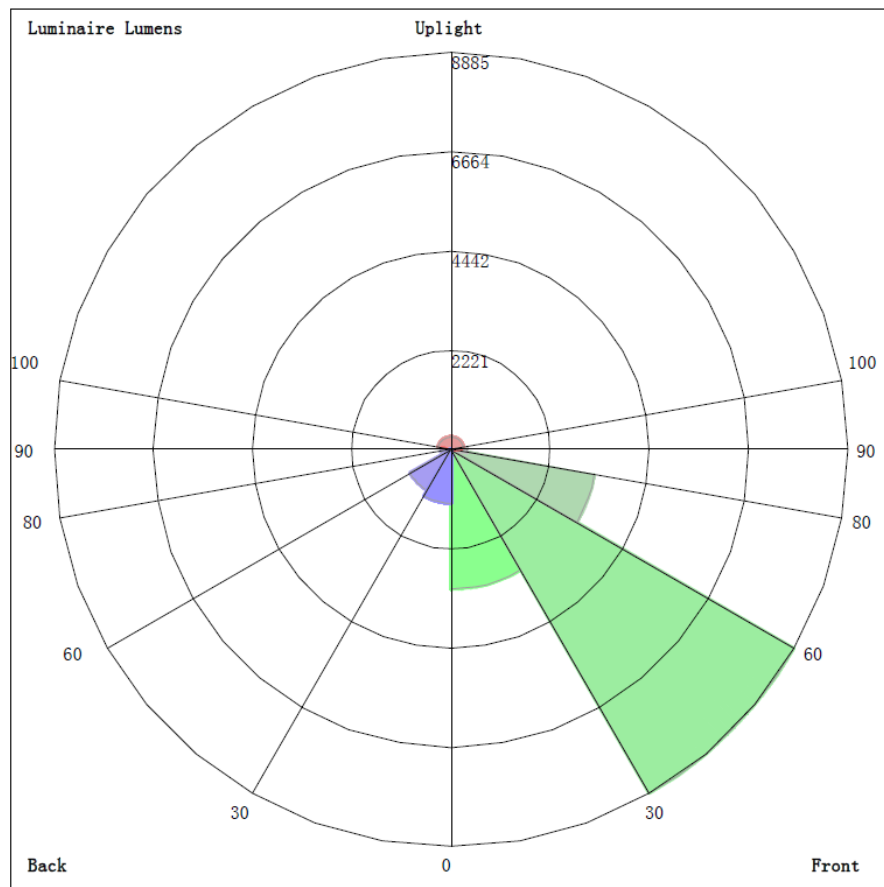
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	φ zone	φ total	lum, lamp
10	496.6	653.3	743.2	653.3	496.6	418.9	386.2	418.9	0- 10	478.4	478.4	2.57,2.57
20	458.2	798.9	937.2	798.9	458.2	248.1	130.6	248.1	10- 20	1466	1944	10.4,10.4
30	379.3	931.9	1079	931.9	379.3	115.6	78.95	115.6	20- 30	2376	4320	23.2,23.2
40	324.0	934.8	1116	934.8	324.0	73.06	26.10	73.06	30- 40	3215	7535	40.4,40.4
50	287.8	897.3	847.5	897.3	287.8	32.52	12.44	32.52	40- 50	3540	11075	59.4,59.4
60	211.9	659.1	638.8	659.1	211.9	16.54	5.913	16.54	50- 60	3177	14251	76.5,76.5
70	143.6	356.3	352.9	356.3	143.6	2.849	0.2218	2.849	60- 70	2318	16569	88.9,88.9
80	80.21	120.0	113.2	120.0	80.21	1.038	0.3540	1.038	70- 80	1165	17735	95.2,95.2
90	7.987	38.39	97.59	38.39	7.987	0.7054	0.4773	0.7054	80- 90	401.2	18136	97.3,97.3
100	6.580	30.39	42.23	30.39	6.580	0.7314	0.6718	0.7314	90-100	217.1	18353	98.5,98.5
110	3.576	10.86	14.33	10.86	3.576	0.5807	0.7796	0.5807	100-110	86.32	18439	98.9,98.9
120	2.993	18.69	11.50	18.69	2.993	0.5403	0.6440	0.5403	110-120	58.39	18498	99.3,99.3
130	1.572	15.20	19.13	15.20	1.572	0.5462	0.7292	0.5462	120-130	61.54	18559	99.6,99.6
140	0.2845	8.915	17.94	8.915	0.2845	0.5913	0.7738	0.5913	130-140	45.59	18605	99.8,99.8
150	0.2987	3.685	8.099	3.685	0.2987	0.6436	0.7430	0.6436	140-150	21.87	18627	100,100
160	0.3555	0.2990	2.381	0.2990	0.3555	0.6552	0.6409	0.6552	150-160	6.570	18633	100,100
170	0.4169	0.3996	0.4024	0.3996	0.4169	0.5285	0.4622	0.5285	160-170	1.699	18635	100,100
180	0.4864	0.4653	0.4055	0.4653	0.4864	0.4523	0.4219	0.4523	170-180	0.4391	18635	100,100
DEG	LUMINOUS INTENSITY:×10cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	478.40	0-10	478.40	2.57%
10-20	1465.54	0-20	1943.94	10.43%
20-30	2375.99	0-30	4319.93	23.18%
30-40	3214.58	0-40	7534.51	40.43%
40-50	3540.28	0-50	11074.79	59.43%
50-60	3176.62	0-60	14251.41	76.48%
60-70	2317.76	0-70	16569.17	88.92%
70-80	1165.41	0-80	17734.58	95.17%
80-90	401.17	0-90	18135.75	97.32%
90-100	217.11	0-100	18352.86	98.49%
100-110	86.32	0-110	18439.18	98.95%
110-120	58.39	0-120	18497.57	99.26%
120-130	61.54	0-130	18559.11	99.59%
130-140	45.59	0-140	18604.70	99.84%
140-150	21.87	0-150	18626.57	99.96%
150-160	6.57	0-160	18633.14	99.99%
160-170	1.70	0-170	18634.84	100.00%
170-180	0.44	0-180	18635.28	100.00%

4.2 Goniophotometer Test

LCS/BUG

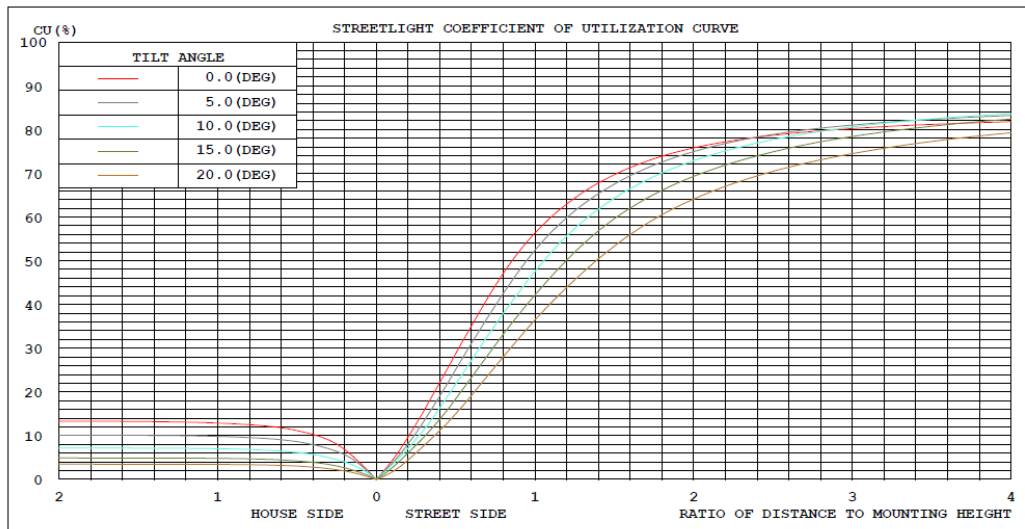


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

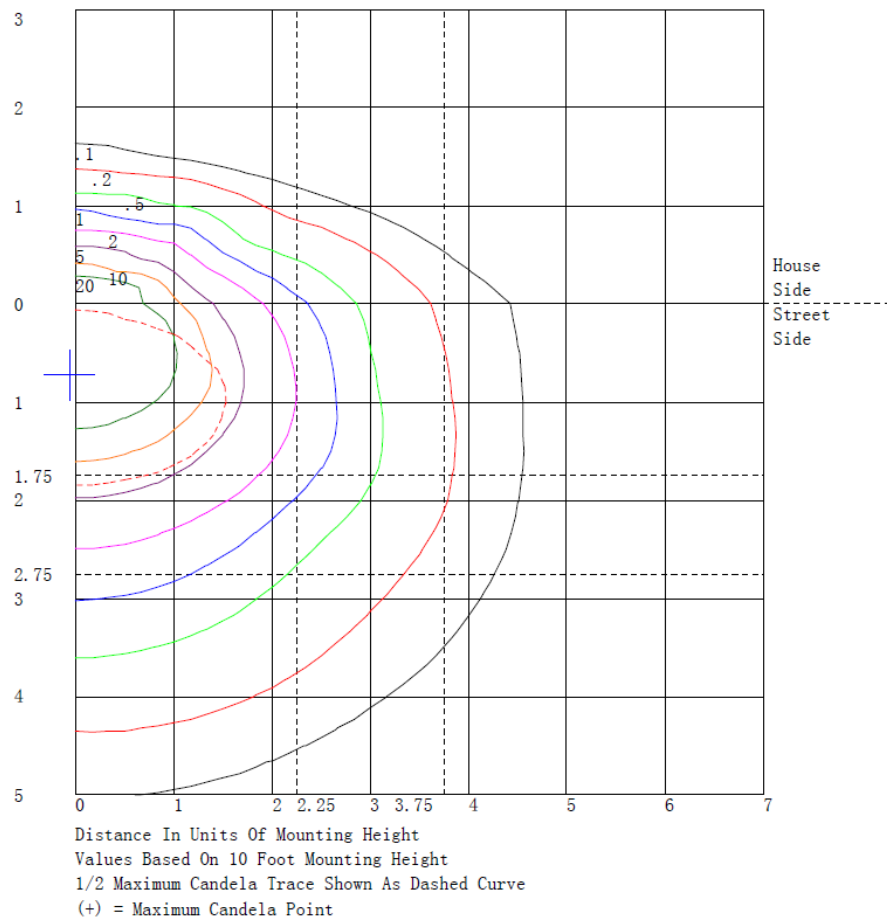
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	3119.3	N.A.	16.7
FM - Front-Medium (30-60)	8884.7	N.A.	47.7
FH - Front-High (60-80)	3260.3	N.A.	17.5
FVH - Front-Very High (80-90)	374.0	N.A.	2.0
BL - Back-Low (0-30)	1200.6	N.A.	6.4
BM - Back-Medium (30-60)	1046.8	N.A.	5.6
BH - Back-High (60-80)	222.9	N.A.	1.2
BVH - Back-Very High (80-90)	27.2	N.A.	0.1
UL - Uplight-Low (90-100)	217.1	N.A.	1.2
UH - Uplight-High (100-180)	282.4	N.A.	1.5
Total	18635.3	N.A.	100.0
BUG Rating	B3-U3-G3		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: *10cd

C (DEG) y	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	515	515	515	514	513	512	512	511	510	509	509	508	508	508	508	508	507	506	505
5	515	513	511	509	503	500	502	526	551	571	562	549	538	553	572	592	602	609	611
10	497	488	489	499	525	556	589	612	633	653	678	700	717	722	723	722	730	737	743
15	477	486	501	523	554	589	629	676	721	758	769	772	771	780	790	799	805	808	810
20	458	481	512	553	611	671	727	758	782	799	815	830	843	860	876	893	912	928	937
25	420	454	495	543	606	671	733	775	812	846	887	926	958	976	988	996	1007	1015	1019
30	379	436	495	557	626	695	763	826	883	932	962	984	1001	1021	1039	1055	1067	1075	1079
35	358	439	515	585	647	706	762	821	878	932	978	1020	1058	1097	1132	1158	1168	1170	1168
40	324	413	498	578	657	730	795	844	889	935	1004	1070	1124	1137	1136	1126	1122	1118	1116
45	322	414	497	573	634	692	750	830	906	972	1003	1018	1022	1020	1013	1002	989	979	973
50	288	365	442	519	599	677	749	811	861	897	905	900	888	883	877	870	861	852	848
55	253	301	360	431	531	630	716	749	762	764	770	772	771	771	768	764	752	740	732
60	212	261	316	378	458	537	604	637	654	659	656	649	640	638	638	639	638	638	639
65	173	226	278	329	385	437	480	503	516	521	520	515	506	495	484	474	468	464	462
70	144	171	201	235	280	323	358	366	364	356	349	342	337	340	345	350	352	352	353
75	102	115	130	148	175	201	221	220	215	208	214	222	231	237	241	244	245	246	246
80	80.2	81.0	84.1	89.6	99.9	111	120	122	122	120	118	115	112	112	112	112	112	113	113
85	33.1	35.3	38.4	42.3	47.9	53.9	59.5	63.4	66.7	69.5	72.0	74.5	77.2	80.8	84.5	88.2	92.1	95.1	96.9
90	7.99	11.8	15.5	19.2	22.7	26.1	29.4	31.3	34.0	38.4	48.1	59.3	70.6	79.9	87.9	94.0	96.6	97.6	97.6
95	5.13	7.33	9.65	12.1	14.3	16.9	20.2	25.4	31.2	37.1	42.6	47.5	51.2	52.4	52.4	51.8	51.4	50.9	50.5
100	6.58	6.12	6.21	6.85	7.66	9.32	12.1	18.1	24.5	30.4	32.5	33.6	34.3	36.3	38.2	40.0	41.2	41.9	42.2
105	4.75	4.02	4.10	4.99	7.44	10.1	12.5	12.8	12.5	11.9	11.8	11.8	11.8	12.1	12.5	12.9	13.3	13.6	13.8
110	3.58	2.84	3.42	5.31	10.2	15.1	18.9	16.8	13.7	10.9	12.5	15.0	17.4	17.3	16.7	15.7	15.0	14.5	14.3
115	4.07	2.62	2.49	3.68	7.21	11.3	15.1	17.2	18.1	17.7	13.9	9.67	5.94	6.01	7.05	8.46	8.71	8.77	8.71
120	2.99	1.48	1.24	2.27	5.40	9.19	13.0	15.5	17.4	18.7	19.3	19.2	18.6	17.1	15.3	13.6	12.3	11.6	11.5
125	2.16	0.91	0.73	1.60	4.12	7.27	10.6	13.2	15.5	17.4	18.6	19.4	19.9	20.0	19.9	19.7	19.3	19.0	18.9
130	1.57	0.44	0.22	0.91	2.97	5.62	8.50	10.9	13.2	15.2	17.0	18.4	19.5	19.8	19.8	19.5	19.4	19.2	19.1
135	0.60	0.26	0.44	1.15	2.54	4.33	6.38	8.51	10.7	12.8	14.6	16.3	17.7	18.6	19.2	19.7	20.1	20.4	20.4
140	0.28	0.79	1.37	2.04	2.74	3.57	4.56	5.90	7.38	8.91	10.4	11.9	13.2	14.1	14.9	15.6	16.6	17.5	17.9
145	0.29	0.54	0.87	1.27	1.71	2.26	2.93	3.82	4.82	5.92	7.16	8.38	9.50	10.3	10.9	11.4	11.9	12.3	12.4
150	0.30	0.55	0.69	0.73	0.43	0.21	0.24	1.24	2.46	3.69	4.31	4.80	5.26	5.94	6.61	7.22	7.67	7.97	8.10
155	0.32	0.27	0.28	0.35	0.50	0.71	0.95	1.17	1.44	1.76	2.24	2.74	3.23	3.58	3.86	4.07	4.21	4.27	4.28
160	0.36	0.35	0.35	0.35	0.38	0.41	0.43	0.34	0.28	0.30	0.61	1.00	1.41	1.74	2.03	2.25	2.35	2.39	2.38
165	0.38	0.39	0.40	0.40	0.39	0.37	0.37	0.39	0.43	0.48	0.60	0.70	0.75	0.63	0.47	0.31	0.28	0.29	0.31
170	0.42	0.42	0.43	0.43	0.43	0.43	0.43	0.42	0.41	0.40	0.39	0.38	0.38	0.38	0.38	0.39	0.39	0.40	0.40
175	0.44	0.45	0.45	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.43	0.42	0.41	0.41	0.40	0.39	0.39	0.39	0.39
180	0.49	0.49	0.49	0.49	0.48	0.48	0.48	0.47	0.47	0.47	0.46	0.45	0.44	0.44	0.43	0.42	0.42	0.41	0.41

UNIT: *10cd																			
C (DBG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
y	0	506	507	508	508	508	508	509	509	510	511	512	512	513	514	515	515	515	511
5	609	602	592	572	553	538	549	562	571	551	526	502	500	503	509	511	513	515	477
10	737	730	722	723	722	717	700	678	653	633	612	589	556	525	499	489	488	497	460
15	808	805	799	790	780	771	772	769	758	721	676	629	589	554	523	501	486	477	454
20	928	912	893	876	860	843	830	815	799	782	758	727	671	611	553	512	481	458	447
25	1015	1007	996	988	976	958	926	887	846	812	775	733	671	606	543	495	454	420	429
30	1075	1067	1055	1039	1021	1001	984	962	932	883	826	763	695	626	557	495	436	379	399
35	1170	1168	1158	1132	1097	1058	1020	978	932	878	821	762	706	647	585	515	439	358	370
40	1118	1122	1126	1136	1137	1124	1070	1004	935	889	844	795	730	657	578	498	413	324	311
45	979	989	1002	1013	1020	1022	1018	1003	972	906	830	750	692	634	573	497	414	322	277
50	852	861	870	877	883	888	900	905	897	861	811	749	677	599	519	442	365	288	222
55	740	752	764	768	771	771	772	770	764	762	749	716	630	531	431	360	301	253	187
60	638	638	639	638	638	640	649	656	659	654	637	604	537	458	378	316	261	212	153
65	464	468	474	484	495	506	515	520	521	516	503	480	437	385	329	278	226	173	126
70	352	352	350	345	340	337	342	349	356	364	366	358	323	280	235	201	171	144	105
75	246	245	244	241	237	231	222	214	208	215	220	221	201	175	148	130	115	102	75.0
80	113	112	112	112	112	112	115	118	120	122	122	120	111	99.9	89.6	84.1	81.0	80.2	54.3
85	95.1	92.1	88.2	84.5	80.8	77.2	74.5	72.0	69.5	66.7	63.4	59.5	53.9	47.9	42.3	38.4	35.3	33.1	23.2
90	97.6	96.6	94.0	87.9	79.9	70.6	59.3	48.1	38.4	34.0	31.3	29.4	26.1	22.7	19.2	15.5	11.8	7.99	6.77
95	50.9	51.4	51.8	52.4	52.4	51.2	47.5	42.6	37.1	31.2	25.4	20.2	16.9	14.3	12.1	9.65	7.33	5.13	4.48
100	41.9	41.2	40.0	38.2	36.3	34.3	33.6	32.5	30.4	24.5	18.1	12.1	9.32	7.66	6.85	6.21	6.12	6.58	5.09
105	13.6	13.3	12.9	12.5	12.1	11.8	11.8	11.8	11.9	12.5	12.8	12.5	10.1	7.44	4.99	4.10	4.02	4.75	3.51
110	14.5	15.0	15.7	16.7	17.3	17.4	15.0	12.5	10.9	13.7	16.8	18.9	15.1	10.2	5.31	3.42	2.84	3.58	2.45
115	8.77	8.71	8.46	7.05	6.01	5.94	9.67	13.9	17.7	18.1	17.2	15.1	11.3	7.21	3.68	2.49	2.62	4.07	2.76
120	11.6	12.3	13.6	15.3	17.1	18.6	19.2	19.3	18.7	17.4	15.5	13.0	9.19	5.40	2.27	1.24	1.48	2.99	2.14
125	19.0	19.3	19.7	19.9	20.0	19.9	19.4	18.6	17.4	15.5	13.2	10.6	7.27	4.12	1.60	0.73	0.91	2.16	1.68
130	19.2	19.4	19.5	19.8	19.8	19.5	18.4	17.0	15.2	13.2	10.9	8.50	5.62	2.97	0.91	0.22	0.44	1.57	1.33
135	20.4	20.1	19.7	19.2	18.6	17.7	16.3	14.6	12.8	10.7	8.51	6.38	4.33	2.54	1.15	0.44	0.26	0.60	0.61
140	17.5	16.6	15.6	14.9	14.1	13.2	11.9	10.4	8.91	7.38	5.90	4.56	3.57	2.74	2.04	1.37	0.79	0.28	0.51
145	12.3	11.9	11.4	10.9	10.3	9.50	8.38	7.16	5.92	4.82	3.82	2.93	2.26	1.71	1.27	0.87	0.54	0.29	0.46
150	7.97	7.67	7.22	6.61	5.94	5.26	4.80	4.31	3.69	2.46	1.24	0.24	0.21	0.43	0.73	0.69	0.55	0.30	0.43
155	4.27	4.21	4.07	3.86	3.58	3.23	2.74	2.24	1.76	1.44	1.17	0.95	0.71	0.50	0.35	0.28	0.27	0.32	0.46
160	2.39	2.35	2.25	2.03	1.74	1.41	1.00	0.61	0.30	0.28	0.34	0.43	0.41	0.38	0.35	0.35	0.35	0.36	0.51
165	0.29	0.28	0.31	0.47	0.63	0.75	0.70	0.60	0.48	0.43	0.39	0.37	0.37	0.39	0.40	0.40	0.39	0.38	0.53
170	0.40	0.39	0.39	0.38	0.38	0.38	0.38	0.39	0.40	0.41	0.42	0.43	0.43	0.43	0.43	0.43	0.42	0.42	0.53
175	0.39	0.39	0.39	0.40	0.41	0.41	0.42	0.43	0.44	0.44	0.44	0.45	0.45	0.45	0.45	0.45	0.45	0.44	0.52
180	0.41	0.42	0.42	0.43	0.44	0.44	0.45	0.46	0.47	0.47	0.47	0.48	0.48	0.48	0.49	0.49	0.49	0.49	0.49

Table--3

UNIT: *10cd

C (DEG) y	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	508	506	505	505	504	504	503	503	503	503	503	503	503	503	503	504	505	504	503
5	449	430	424	424	427	425	424	424	428	433	436	434	430	426	425	425	425	425	425
10	434	418	417	421	428	427	424	419	408	396	387	387	390	393	390	388	388	388	390
15	436	422	417	414	410	395	378	357	336	314	294	275	259	247	239	234	233	234	239
20	435	421	409	394	372	333	291	248	215	188	166	151	142	136	132	131	131	131	132
25	425	408	374	332	284	233	186	146	128	120	117	113	111	111	109	108	108	108	109
30	398	377	322	257	193	157	132	116	108	104	103	97.1	91.2	85.9	82.3	80.0	79.0	80.0	82.3
35	362	334	267	193	127	108	102	103	91.2	79.6	68.7	60.5	53.9	48.8	45.3	43.3	42.6	43.3	45.3
40	289	258	209	157	111	91.5	80.1	73.1	60.3	48.7	38.9	33.5	30.0	28.1	26.7	26.1	26.1	26.1	26.7
45	235	196	157	123	93.0	73.1	58.3	47.5	38.1	31.3	27.0	25.9	26.3	27.3	27.1	26.8	26.7	26.8	27.1
50	169	128	104	88.1	77.0	60.0	44.8	32.5	27.9	26.0	25.2	21.7	18.3	15.3	13.6	12.7	12.4	12.7	13.6
55	134	93.8	72.7	60.9	54.4	43.4	33.9	25.9	20.3	16.2	13.3	11.4	10.3	9.74	9.30	9.12	9.16	9.12	9.30
60	106	70.9	52.4	42.4	37.3	29.0	22.1	16.5	12.6	9.74	7.87	6.76	6.23	6.07	5.90	5.86	5.91	5.86	5.90
65	87.0	57.6	40.5	30.1	24.1	17.3	12.3	8.55	5.57	3.44	1.98	1.00	0.44	0.18	0.07	0.09	0.17	0.09	0.07
70	73.6	48.7	32.6	21.9	15.0	9.13	5.24	2.85	1.23	0.42	0.16	0.01	0.07	0.23	0.23	0.23	0.22	0.23	0.23
75	52.1	33.9	21.4	12.7	7.19	3.76	2.05	1.44	0.68	0.31	0.20	0.14	0.18	0.27	0.29	0.29	0.29	0.29	0.29
80	33.7	18.4	10.1	5.74	3.99	2.19	1.32	1.04	0.59	0.34	0.23	0.20	0.24	0.31	0.33	0.35	0.35	0.35	0.33
85	15.2	9.07	5.50	3.39	2.32	1.44	0.98	0.80	0.54	0.37	0.29	0.28	0.31	0.36	0.39	0.41	0.42	0.41	0.39
90	5.62	4.54	3.48	2.53	1.74	1.25	0.92	0.71	0.53	0.42	0.37	0.36	0.38	0.41	0.44	0.46	0.48	0.46	0.44
95	3.84	3.23	2.58	1.99	1.48	1.13	0.88	0.70	0.58	0.51	0.47	0.46	0.47	0.49	0.52	0.55	0.57	0.55	0.52
100	3.84	2.84	2.14	1.64	1.30	1.03	0.85	0.73	0.64	0.58	0.56	0.55	0.55	0.57	0.61	0.65	0.67	0.65	0.61
105	2.50	1.69	1.13	0.76	0.55	0.50	0.55	0.64	0.67	0.70	0.72	0.71	0.71	0.70	0.73	0.77	0.80	0.77	0.73
110	1.61	1.04	0.90	0.93	1.02	0.88	0.72	0.58	0.56	0.57	0.60	0.63	0.66	0.69	0.73	0.76	0.78	0.76	0.73
115	1.77	1.08	0.84	0.80	0.86	0.75	0.66	0.58	0.57	0.59	0.61	0.62	0.63	0.63	0.64	0.64	0.64	0.64	0.64
120	1.48	1.01	0.80	0.72	0.71	0.63	0.57	0.54	0.55	0.57	0.60	0.62	0.63	0.63	0.64	0.64	0.64	0.64	0.64
125	1.29	0.99	0.80	0.69	0.63	0.57	0.54	0.53	0.55	0.58	0.62	0.64	0.65	0.66	0.67	0.68	0.68	0.68	0.67
130	1.11	0.93	0.77	0.66	0.57	0.54	0.53	0.55	0.56	0.59	0.62	0.65	0.68	0.71	0.72	0.73	0.73	0.73	0.72
135	0.61	0.61	0.59	0.57	0.56	0.55	0.56	0.57	0.60	0.63	0.66	0.69	0.71	0.73	0.74	0.74	0.74	0.74	0.74
140	0.66	0.75	0.71	0.64	0.55	0.55	0.57	0.59	0.61	0.63	0.66	0.70	0.73	0.76	0.77	0.77	0.77	0.77	0.77
145	0.58	0.65	0.65	0.61	0.57	0.58	0.60	0.62	0.64	0.66	0.68	0.72	0.75	0.78	0.78	0.78	0.78	0.78	0.78
150	0.53	0.59	0.60	0.60	0.59	0.60	0.62	0.64	0.66	0.67	0.69	0.72	0.74	0.76	0.76	0.75	0.74	0.75	0.76
155	0.56	0.63	0.65	0.65	0.64	0.64	0.64	0.64	0.65	0.66	0.68	0.70	0.71	0.73	0.72	0.70	0.69	0.70	0.72
160	0.62	0.69	0.71	0.71	0.69	0.68	0.66	0.66	0.66	0.67	0.68	0.67	0.66	0.66	0.65	0.65	0.64	0.65	0.65
165	0.64	0.70	0.72	0.71	0.68	0.67	0.66	0.65	0.64	0.63	0.62	0.59	0.57	0.56	0.56	0.56	0.56	0.56	0.56
170	0.61	0.66	0.67	0.65	0.62	0.59	0.56	0.53	0.52	0.51	0.50	0.49	0.48	0.47	0.46	0.46	0.46	0.46	0.46
175	0.58	0.61	0.61	0.59	0.57	0.53	0.49	0.46	0.46	0.46	0.46	0.45	0.43	0.42	0.42	0.43	0.43	0.43	0.42
180	0.49	0.48	0.48	0.48	0.48	0.47	0.46	0.45	0.44	0.43	0.42	0.41	0.41	0.41	0.41	0.42	0.42	0.42	0.41

C (DEG) y	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	503	503	503	503	503	503	503	503	504	504	505	505	506	508	511				
5	426	430	434	436	433	428	424	424	425	427	424	424	430	449	477				
10	393	390	387	387	396	408	419	424	427	428	421	417	418	434	460				
15	247	259	275	294	314	336	357	378	395	410	414	417	422	436	454				
20	136	142	151	166	188	215	248	291	333	372	394	409	421	435	447				
25	111	111	113	117	120	128	146	186	233	284	332	374	408	425	429				
30	85.9	91.2	97.1	103	104	108	116	132	157	193	257	322	377	398	399				
35	48.8	53.9	60.5	68.7	79.6	91.2	103	102	108	127	193	267	334	362	370				
40	28.1	30.0	33.5	38.9	48.7	60.3	73.1	80.1	91.5	111	157	209	258	289	311				
45	27.3	26.3	25.9	27.0	31.3	38.1	47.5	58.3	73.1	93.0	123	157	196	235	277				
50	15.3	18.3	21.7	25.2	26.0	27.9	32.5	44.8	60.0	77.0	88.1	104	128	169	222				
55	9.74	10.3	11.4	13.3	16.2	20.3	25.9	33.9	43.4	54.4	60.9	72.7	93.8	134	187				
60	6.07	6.23	6.76	7.87	9.74	12.6	16.5	22.1	29.0	37.3	42.4	52.4	70.9	106	153				
65	0.18	0.44	1.00	1.98	3.44	5.57	8.55	12.3	17.3	24.1	30.1	40.5	57.6	87.0	126				
70	0.23	0.07	0.01	0.16	0.42	1.23	2.85	5.24	9.13	15.0	21.9	32.6	48.7	73.6	105				
75	0.27	0.18	0.14	0.20	0.31	0.68	1.44	2.05	3.76	7.19	12.7	21.4	33.9	52.1	75.0				
80	0.31	0.24	0.20	0.23	0.34	0.59	1.04	1.32	2.19	3.99	5.74	10.1	18.4	33.7	54.3				
85	0.36	0.31	0.28	0.29	0.37	0.54	0.80	0.98	1.44	2.32	3.39	5.50	9.07	15.2	23.2				
90	0.41	0.38	0.36	0.37	0.42	0.53	0.71	0.92	1.25	1.74	2.53	3.48	4.54	5.62	6.77				
95	0.49	0.47	0.46	0.47	0.51	0.58	0.70	0.88	1.13	1.48	1.99	2.58	3.23	3.84	4.48				
100	0.57	0.55	0.55	0.56	0.58	0.64	0.73	0.85	1.03	1.30	1.64	2.14	2.84	3.84	5.09				
105	0.70	0.71	0.71	0.72	0.70	0.67	0.64	0.55	0.50	0.55	0.76	1.13	1.69	2.50	3.51				
110	0.69	0.66	0.63	0.60	0.57	0.56	0.58	0.72	0.88	1.02	0.93	0.90	1.04	1.61	2.45				
115	0.63	0.63	0.62	0.61	0.59	0.57	0.58	0.66	0.75	0.86	0.80	0.84	1.08	1.77	2.76				
120	0.63	0.63	0.62	0.60	0.57	0.55	0.54	0.57	0.63	0.71	0.72	0.80	1.01	1.48	2.14				
125	0.66	0.65	0.64	0.62	0.58	0.55	0.53	0.54	0.57	0.63	0.69	0.80	0.99	1.29	1.68				
130	0.71	0.68	0.65	0.62	0.59	0.56	0.55	0.53	0.54	0.57	0.66	0.77	0.93	1.11	1.33				
135	0.73	0.71	0.69	0.66	0.63	0.60	0.57	0.56	0.55	0.56	0.57	0.59	0.61	0.61	0.61				
140	0.76	0.73	0.70	0.66	0.63	0.61	0.59	0.57	0.55	0.55	0.64	0.71	0.75	0.66	0.51				
145	0.78	0.75	0.72	0.68	0.66	0.64	0.62	0.60	0.58	0.57	0.61	0.65	0.65	0.58	0.46				
150	0.76	0.74	0.72	0.69	0.67	0.66	0.64	0.62	0.60	0.59	0.60	0.60	0.59	0.53	0.43				
155	0.73	0.71	0.70	0.68	0.66	0.65	0.64	0.64	0.64	0.64	0.65	0.65	0.63	0.56	0.46				
160	0.66	0.66	0.67	0.68	0.67	0.66	0.66	0.66	0.68	0.69	0.71	0.71	0.69	0.62	0.51				
165	0.56	0.57	0.59	0.62	0.63	0.64	0.65	0.66	0.67	0.68	0.71	0.72	0.70	0.64	0.53				
170	0.47	0.48	0.49	0.50	0.51	0.52	0.53	0.56	0.59	0.62	0.65	0.67	0.66	0.61	0.53				
175	0.42	0.43	0.45	0.46	0.46	0.46	0.46	0.49	0.53	0.57	0.59	0.61	0.61	0.58	0.52				
180	0.41	0.41	0.41	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.48	0.48	0.48	0.49	0.49				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	WPX3 @ 130W / 4000K	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	1.051	126.1	0.998	4.08
277.0	60	0.461	122.5	0.959	7.17

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*****