

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

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Issue Date: 2023-10-30

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		18234
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		141.1
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		17752
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	137.4
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		129.2
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	480V	13.54
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	480V	0.904
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5233
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		84.9
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		14
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		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%		2.1%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		480.0
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.298
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		129.2
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-10-23	WPX3 @ 130W / 5000K 480	231020002-S1
2	Goniophotometer Test	2023-10-23	WPX3 @ 130W / 5000K 480	231020002-S1
3	THD and PF Test	2023-10-23	WPX3 @ 130W / 5000K 480	231020002-S1

Remark (If any)

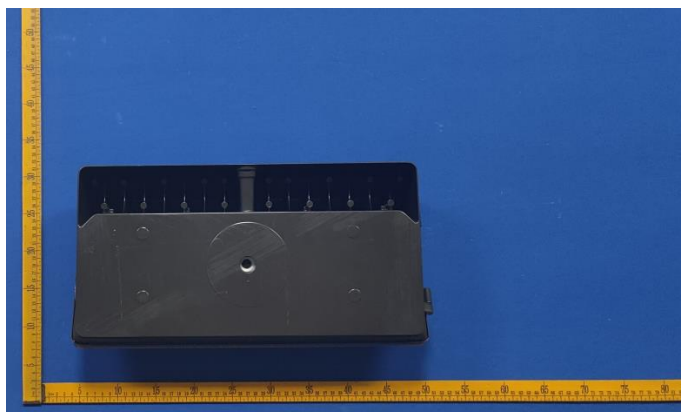
1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

3.0 Product Description

Luminaire Description: Model No. WPX3 @ 130W / 5000K 480, color tunable from 3000K, 4000K and 5000K.

Electrical Specification: 480Vac, 50/60Hz

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	WPX3 @ 130W / 5000K 480	Sample ID	231020002-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

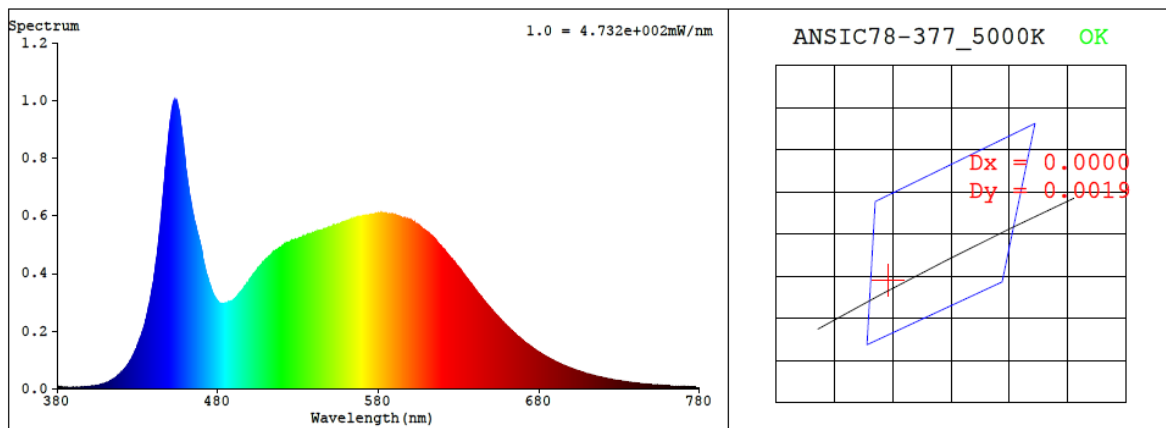
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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
480.0	60	0.298	129.2	0.904

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5233	84.9	14	0.0009	85	95	-12%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3389$ $y = 0.3484$ / $u' = 0.2084$ $v' = 0.4822$ ($duv = 9.49e-04$)

CCT= 5233K Prcp WL: Ld=567.0nm Purity=6.2%

Peak WL: Lp=453nm FWHM: =26.2nm Ratio:R=15.6% G=79.3% B=5.1%

Render Index: Ra = 84.9 AvgR = 78.7 TM30:Rf=84 Rg=95

EEL: 0.09862 A++ Highest

R1 =84	R2 =91	R3 =94	R4 =83	R5 =84	R6 =87	R7 =87
R8 =69	R9 =14	R10=78	R11=83	R12=65	R13=86	R14=97
R15=79						

4.1 Integrating Sphere Test

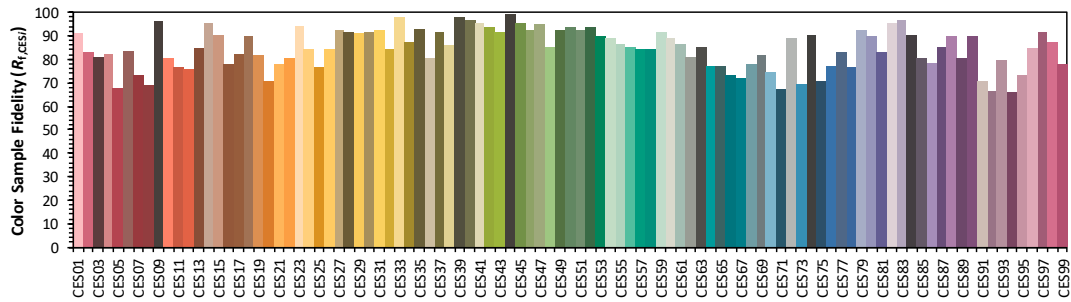
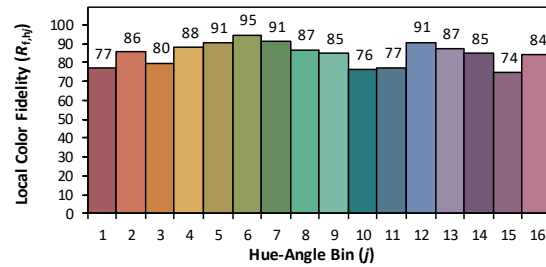
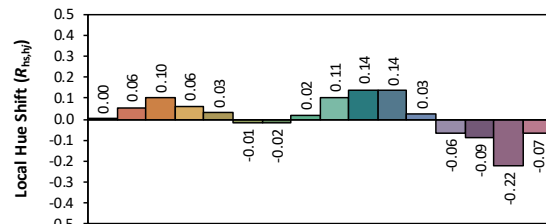
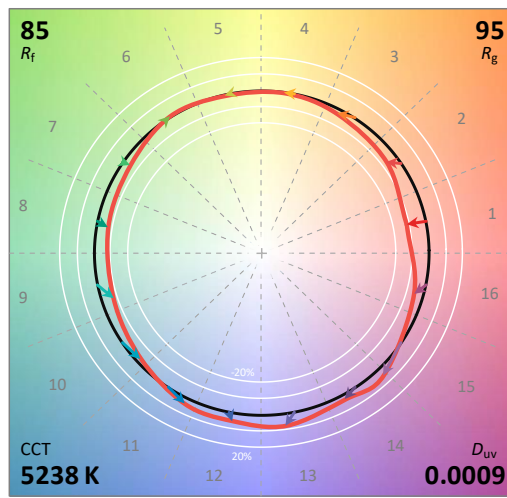
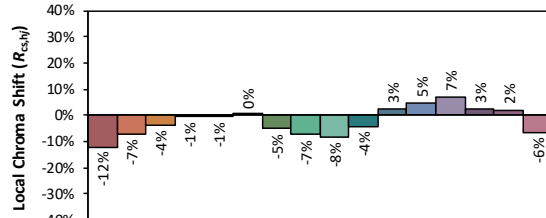
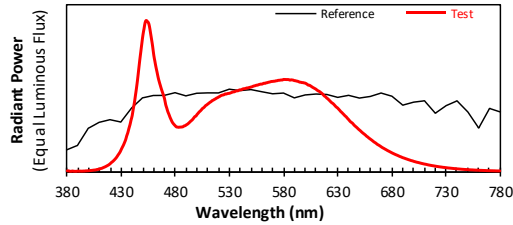
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/10/30

Model: WPX3 @ 130W / 5000K 480



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

x 0.3388
 y 0.3482
 u' 0.2085
 v' 0.4821

CIE 13.3-1995
(CRI)

R_a 85
 R_g 14

4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	6.90E-06	447	7.36E-04	514	4.70E-04	581	6.10E-04	648	2.92E-04	715	4.48E-05
381	7.10E-06	448	7.93E-04	515	4.73E-04	582	6.10E-04	649	2.85E-04	716	4.35E-05
382	5.20E-06	449	8.51E-04	516	4.78E-04	583	6.09E-04	650	2.78E-04	717	4.21E-05
383	3.80E-06	450	9.05E-04	517	4.82E-04	584	6.09E-04	651	2.73E-04	718	4.09E-05
384	4.80E-06	451	9.45E-04	518	4.87E-04	585	6.09E-04	652	2.65E-04	719	3.99E-05
385	5.80E-06	452	9.86E-04	519	4.90E-04	586	6.06E-04	653	2.59E-04	720	3.85E-05
386	4.10E-06	453	1.00E-03	520	4.94E-04	587	6.08E-04	654	2.53E-04	721	3.74E-05
387	4.00E-06	454	9.92E-04	521	4.98E-04	588	6.07E-04	655	2.48E-04	722	3.61E-05
388	3.60E-06	455	9.85E-04	522	5.03E-04	589	6.06E-04	656	2.42E-04	723	3.50E-05
389	4.70E-06	456	9.60E-04	523	5.06E-04	590	6.03E-04	657	2.35E-04	724	3.39E-05
390	5.70E-06	457	9.16E-04	524	5.08E-04	591	6.02E-04	658	2.30E-04	725	3.29E-05
391	4.30E-06	458	8.72E-04	525	5.10E-04	592	6.00E-04	659	2.24E-04	726	3.20E-05
392	5.30E-06	459	8.25E-04	526	5.14E-04	593	5.98E-04	660	2.19E-04	727	3.09E-05
393	4.90E-06	460	7.70E-04	527	5.14E-04	594	5.96E-04	661	2.13E-04	728	2.98E-05
394	5.10E-06	461	7.31E-04	528	5.16E-04	595	5.93E-04	662	2.08E-04	729	2.94E-05
395	5.70E-06	462	6.92E-04	529	5.18E-04	596	5.92E-04	663	2.02E-04	730	2.81E-05
396	5.60E-06	463	6.59E-04	530	5.19E-04	597	5.90E-04	664	1.96E-04	731	2.75E-05
397	6.70E-06	464	6.24E-04	531	5.21E-04	598	5.89E-04	665	1.92E-04	732	2.63E-05
398	6.90E-06	465	5.96E-04	532	5.24E-04	599	5.87E-04	666	1.87E-04	733	2.56E-05
399	7.50E-06	466	5.72E-04	533	5.27E-04	600	5.86E-04	667	1.81E-04	734	2.50E-05
400	7.90E-06	467	5.48E-04	534	5.28E-04	601	5.82E-04	668	1.77E-04	735	2.42E-05
401	8.80E-06	468	5.26E-04	535	5.30E-04	602	5.78E-04	669	1.73E-04	736	2.34E-05
402	9.50E-06	469	5.05E-04	536	5.34E-04	603	5.72E-04	670	1.68E-04	737	2.27E-05
403	1.02E-05	470	4.81E-04	537	5.35E-04	604	5.72E-04	671	1.63E-04	738	2.19E-05
404	1.13E-05	471	4.45E-04	538	5.36E-04	605	5.68E-04	672	1.58E-04	739	2.13E-05
405	1.22E-05	472	4.22E-04	539	5.40E-04	606	5.63E-04	673	1.55E-04	740	2.05E-05
406	1.27E-05	473	3.97E-04	540	5.42E-04	607	5.58E-04	674	1.50E-04	741	1.97E-05
407	1.47E-05	474	3.80E-04	541	5.42E-04	608	5.54E-04	675	1.46E-04	742	1.94E-05
408	1.63E-05	475	3.61E-04	542	5.46E-04	609	5.50E-04	676	1.42E-04	743	1.87E-05
409	1.77E-05	476	3.45E-04	543	5.49E-04	610	5.46E-04	677	1.38E-04	744	1.81E-05
410	1.94E-05	477	3.30E-04	544	5.49E-04	611	5.40E-04	678	1.35E-04	745	1.74E-05
411	2.23E-05	478	3.19E-04	545	5.51E-04	612	5.35E-04	679	1.31E-04	746	1.70E-05
412	2.39E-05	479	3.11E-04	546	5.54E-04	613	5.32E-04	680	1.27E-04	747	1.64E-05
413	2.74E-05	480	3.03E-04	547	5.54E-04	614	5.27E-04	681	1.23E-04	748	1.60E-05
414	3.04E-05	481	2.97E-04	548	5.56E-04	615	5.21E-04	682	1.20E-04	749	1.56E-05
415	3.36E-05	482	2.96E-04	549	5.58E-04	616	5.15E-04	683	1.17E-04	750	1.51E-05
416	3.72E-05	483	2.94E-04	550	5.60E-04	617	5.07E-04	684	1.13E-04	751	1.44E-05
417	4.13E-05	484	2.96E-04	551	5.62E-04	618	5.00E-04	685	1.11E-04	752	1.40E-05
418	4.52E-05	485	2.96E-04	552	5.66E-04	619	4.96E-04	686	1.07E-04	753	1.37E-05
419	5.02E-05	486	2.97E-04	553	5.68E-04	620	4.87E-04	687	1.04E-04	754	1.33E-05
420	5.64E-05	487	2.98E-04	554	5.69E-04	621	4.83E-04	688	1.01E-04	755	1.31E-05
421	6.32E-05	488	3.03E-04	555	5.72E-04	622	4.75E-04	689	9.83E-05	756	1.24E-05
422	6.85E-05	489	3.05E-04	556	5.73E-04	623	4.68E-04	690	9.48E-05	757	1.21E-05
423	7.54E-05	490	3.10E-04	557	5.76E-04	624	4.61E-04	691	9.25E-05	758	1.17E-05
424	8.29E-05	491	3.14E-04	558	5.78E-04	625	4.55E-04	692	9.01E-05	759	1.14E-05
425	9.10E-05	492	3.20E-04	559	5.79E-04	626	4.50E-04	693	8.73E-05	760	1.09E-05
426	1.01E-04	493	3.27E-04	560	5.79E-04	627	4.42E-04	694	8.50E-05	761	1.09E-05
427	1.12E-04	494	3.34E-04	561	5.82E-04	628	4.34E-04	695	8.23E-05	762	1.02E-05
428	1.22E-04	495	3.40E-04	562	5.85E-04	629	4.27E-04	696	8.00E-05	763	1.02E-05
429	1.34E-04	496	3.47E-04	563	5.84E-04	630	4.22E-04	697	7.76E-05	764	9.80E-06
430	1.49E-04	497	3.56E-04	564	5.88E-04	631	4.14E-04	698	7.50E-05	765	9.60E-06
431	1.64E-04	498	3.65E-04	565	5.89E-04	632	4.07E-04	699	7.33E-05	766	9.30E-06
432	1.78E-04	499	3.69E-04	566	5.92E-04	633	3.98E-04	700	7.11E-05	767	9.10E-06
433	1.95E-04	500	3.79E-04	567	5.93E-04	634	3.92E-04	701	6.85E-05	768	8.60E-06
434	2.13E-04	501	3.87E-04	568	5.95E-04	635	3.84E-04	702	6.68E-05	769	8.40E-06
435	2.39E-04	502	3.95E-04	569	5.97E-04	636	3.77E-04	703	6.45E-05	770	8.10E-06
436	2.59E-04	503	4.02E-04	570	5.97E-04	637	3.70E-04	704	6.30E-05	771	8.00E-06
437	2.87E-04	504	4.09E-04	571	5.98E-04	638	3.64E-04	705	6.13E-05	772	7.50E-06
438	3.12E-04	505	4.18E-04	572	5.99E-04	639	3.55E-04	706	5.95E-05	773	7.60E-06
439	3.43E-04	506	4.23E-04	573	6.01E-04	640	3.48E-04	707	5.76E-05	774	7.20E-06
440	3.71E-04	507	4.30E-04	574	6.02E-04	641	3.39E-04	708	5.57E-05	775	7.20E-06
441	4.15E-04	508	4.38E-04	575	6.04E-04	642	3.31E-04	709	5.41E-05	776	6.80E-06
442	4.54E-04	509	4.42E-04	576	6.05E-04	643	3.26E-04	710	5.23E-05	777	6.60E-06
443	5.03E-04	510	4.48E-04	577	6.06E-04	644	3.20E-04	711	5.10E-05	778	6.50E-06
444	5.54E-04	511	4.53E-04	578	6.07E-04	645	3.11E-04	712	4.97E-05	779	6.50E-06
445	6.10E-04	512	4.60E-04	579	6.07E-04	646	3.04E-04	713	4.79E-05	780	6.50E-06
446	6.73E-04	513	4.64E-04	580	6.10E-04	647	2.98E-04	714	4.62E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	WPX3 @ 130W / 5000K 480	Sample ID	231020002-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	42.1

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	480.0	60	0.298	129.2	0.904
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

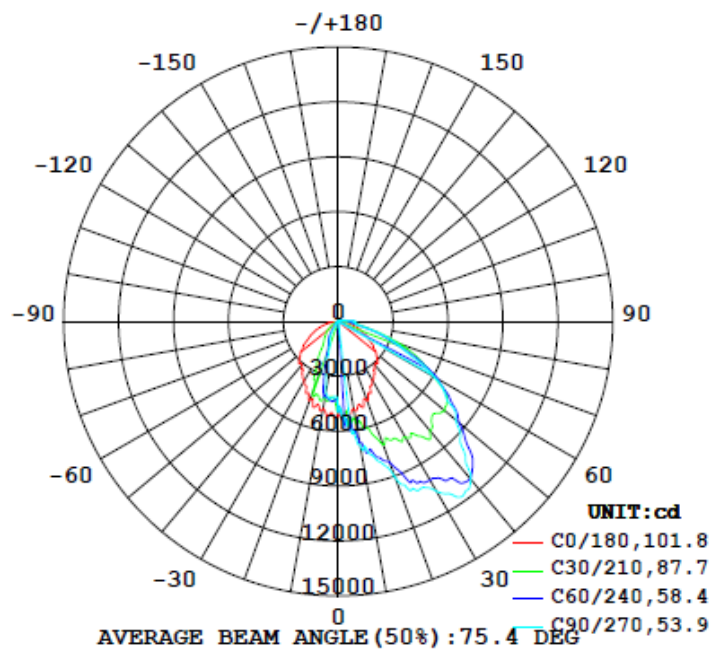
Test Result

Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	BUG
		C0-180	C90-270	C0-180	C90-270		(80°-90°)	
0°-180° zones	18234	106.9	145.4	54.8	101.1	141.1	2.0%	B3-U3-G3
0°-90° zones	17752	106.9	145.4	54.8	101.1	137.4	2.1%	B3-U3-G3

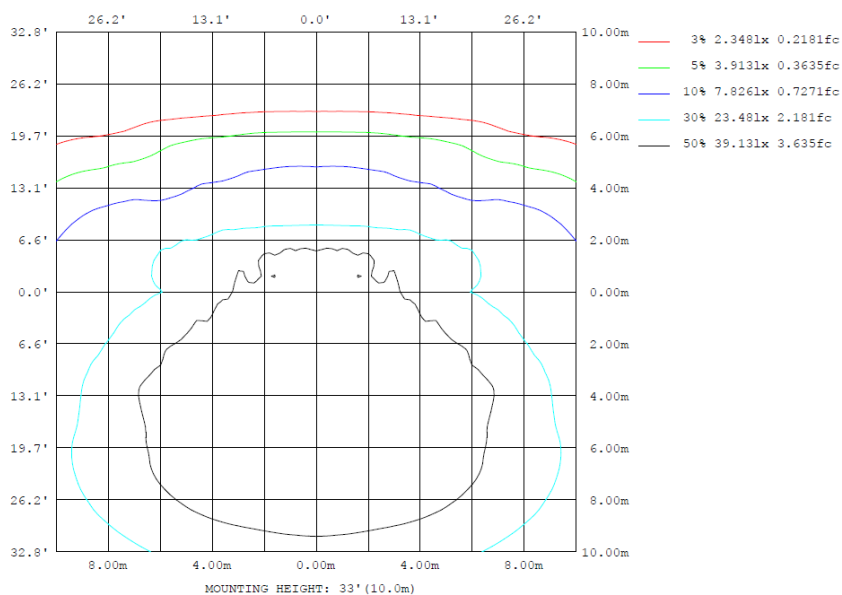
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

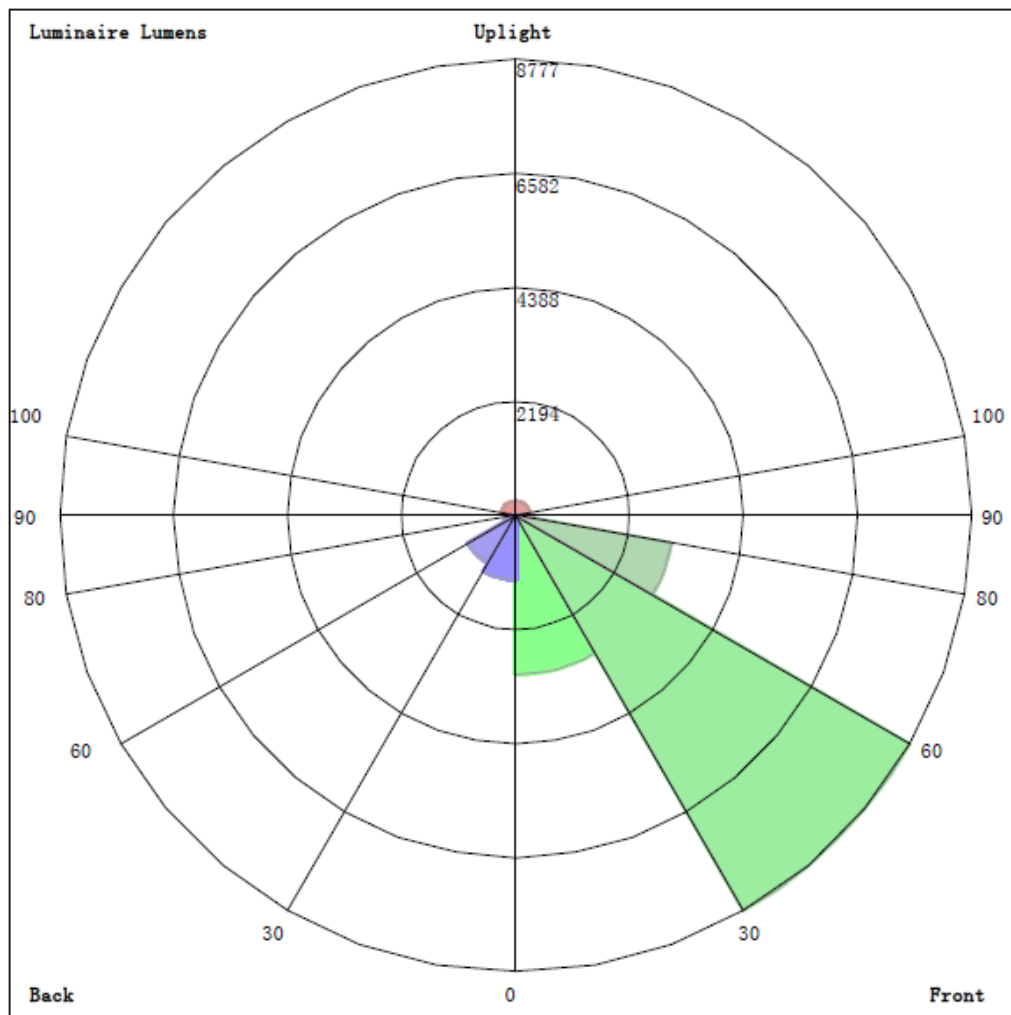
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	485.9	632.4	686.4	632.4	485.9	436.0	395.1	436.0	0- 10	472.7	472.7	2.59, 2.59
20	461.2	773.1	903.1	773.1	461.2	255.1	137.4	255.1	10- 20	1446	1919	10.5, 10.5
30	373.3	931.1	1073	931.1	373.3	124.3	76.76	124.3	20- 30	2372	4291	23.5, 23.5
40	310.9	934.5	1127	934.5	310.9	72.09	26.01	72.09	30- 40	3191	7482	41, 41
50	270.8	901.6	836.6	901.6	270.8	31.96	12.18	31.96	40- 50	3503	10985	60.2, 60.2
60	188.9	647.0	599.4	647.0	188.9	16.04	5.125	16.04	50- 60	3142	14127	77.5, 77.5
70	121.5	324.2	318.8	324.2	121.5	2.273	0.3630	2.273	60- 70	2207	16333	89.6, 89.6
80	50.80	101.2	99.90	101.2	50.80	1.097	0.4712	1.097	70- 80	1045	17378	95.3, 95.3
90	4.589	39.39	91.69	39.39	4.589	0.8156	0.6280	0.8156	80- 90	373.5	17752	97.4, 97.4
100	4.709	29.13	39.29	29.13	4.709	0.8622	0.7458	0.8622	90-100	211.5	17963	98.5, 98.5
110	3.098	9.971	13.30	9.971	3.098	0.5697	0.9218	0.5697	100-110	81.70	18045	99, 99
120	2.897	18.31	10.88	18.31	2.897	0.5297	0.6221	0.5297	110-120	56.37	18101	99.3, 99.3
130	1.529	14.76	17.96	14.76	1.529	0.5296	0.7233	0.5296	120-130	58.53	18160	99.6, 99.6
140	0.3372	8.708	17.21	8.708	0.3372	0.5688	0.7638	0.5688	130-140	43.56	18203	99.8, 99.8
150	0.2978	3.891	8.025	3.891	0.2978	0.6249	0.7160	0.6249	140-150	21.64	18225	100, 100
160	0.3480	0.2813	2.528	0.2813	0.3480	0.6437	0.6233	0.6437	150-160	6.666	18232	100, 100
170	0.4074	0.3836	0.4072	0.3836	0.4074	0.5217	0.4530	0.5217	160-170	1.652	18233	100, 100
180	0.4743	0.4568	0.3982	0.4568	0.4743	0.4487	0.4140	0.4487	170-180	0.4294	18234	100, 100
DEG	LUMINOUS INTENSITY: *10cd									UNIT: lm		

	Zonal (lm)		Total (lm)	Percent
0-10	472.66	0-10	472.66	2.59%
10-20	1446.37	0-20	1919.03	10.52%
20-30	2372.04	0-30	4291.07	23.53%
30-40	3191.22	0-40	7482.29	41.04%
40-50	3502.53	0-50	10984.82	60.25%
50-60	3141.78	0-60	14126.60	77.48%
60-70	2206.59	0-70	16333.19	89.58%
70-80	1044.93	0-80	17378.12	95.31%
80-90	373.52	0-90	17751.64	97.36%
90-100	211.54	0-100	17963.18	98.52%
100-110	81.70	0-110	18044.88	98.97%
110-120	56.37	0-120	18101.25	99.28%
120-130	58.53	0-130	18159.78	99.60%
130-140	43.56	0-140	18203.34	99.84%
140-150	21.64	0-150	18224.98	99.95%
150-160	6.67	0-160	18231.65	99.99%
160-170	1.65	0-170	18233.30	100.00%
170-180	0.43	0-180	18233.73	100.00%

4.2 Goniophotometer Test

LCS/BUG

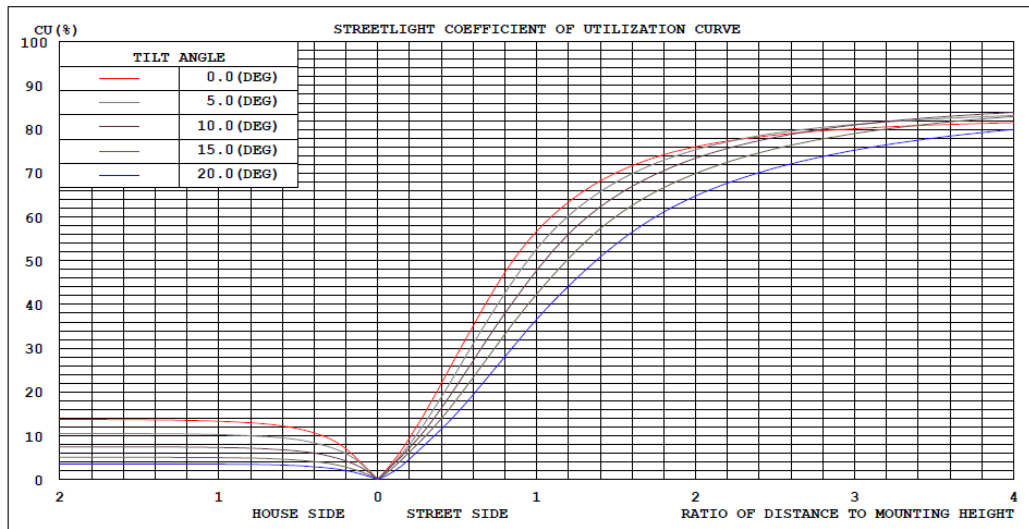


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

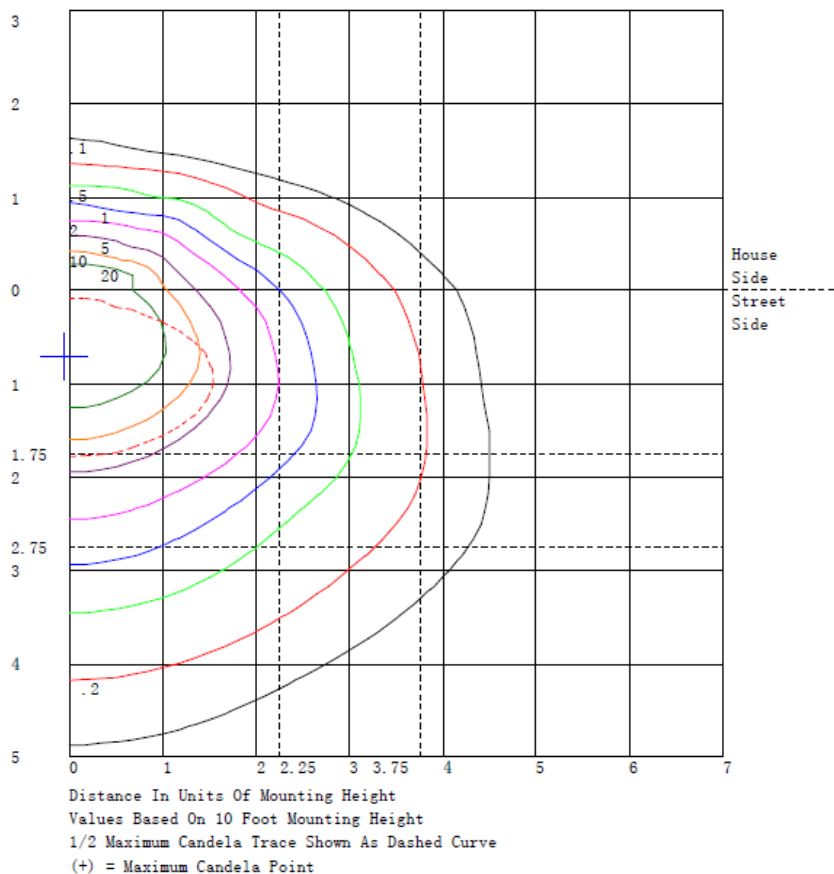
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	3057.4	N.A.	16.8
FM - Front-Medium (30-60)	8776.6	N.A.	48.1
FH - Front-High (60-80)	3047.0	N.A.	16.7
FVH - Front-Very High (80-90)	352.5	N.A.	1.9
BL - Back-Low (0-30)	1233.7	N.A.	6.8
BM - Back-Medium (30-60)	1058.9	N.A.	5.8
BH - Back-High (60-80)	204.5	N.A.	1.1
BVH - Back-Very High (80-90)	21.0	N.A.	0.1
UL - Uplight-Low (90-100)	211.5	N.A.	1.2
UH - Uplight-High (100-180)	270.6	N.A.	1.5
Total	18233.7	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) γ (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	500	500	500	500	500	500	499	499	499	498	498	498	497	497	497	496	496	495	495
5	504	498	493	490	485	483	488	513	539	561	554	541	531	545	563	580	583	583	581
10	486	476	476	485	509	538	569	593	614	632	648	662	672	679	683	686	687	686	686
15	480	481	490	506	531	562	599	646	691	730	743	749	750	760	769	776	777	776	773
20	461	471	494	530	592	658	718	745	762	773	788	802	817	836	854	871	887	898	903
25	424	458	497	542	597	653	708	748	786	823	870	915	956	986	1008	1023	1027	1025	1022
30	373	426	481	539	601	665	730	803	872	931	964	987	1003	1018	1032	1043	1056	1067	1073
35	349	422	494	564	635	702	765	816	863	908	958	1007	1053	1093	1126	1152	1165	1171	1171
40	311	386	462	539	622	703	778	834	885	934	1004	1068	1121	1135	1136	1130	1128	1126	1127
45	307	393	472	545	606	666	727	815	901	974	1011	1029	1032	1020	1000	978	962	950	945
50	271	344	420	500	590	678	759	823	871	902	898	882	862	859	857	856	848	841	837
55	234	298	369	448	548	645	726	756	766	764	762	756	748	742	735	729	723	718	717
60	189	247	310	377	460	539	605	633	646	647	644	636	627	623	619	615	608	602	599
65	154	209	264	319	384	443	491	507	510	503	494	481	467	456	447	440	434	431	430
70	122	152	186	223	273	320	355	355	342	324	315	308	304	306	310	315	316	318	319
75	87.1	104	122	143	171	196	215	212	202	191	191	193	196	196	196	196	196	196	198
80	50.8	58.0	67.2	78.2	95.3	111	123	119	111	101	99.0	98.3	98.6	98.8	99.2	99.7	99.6	99.6	99.9
85	17.8	23.3	29.7	36.8	46.2	55.3	62.9	64.8	65.3	65.6	68.9	73.0	77.4	81.6	85.7	89.5	93.1	95.9	97.4
90	4.59	8.98	13.3	17.4	21.4	25.3	29.0	31.6	34.7	39.4	49.1	59.9	70.4	77.6	83.3	87.6	90.0	91.3	91.7
95	3.79	6.16	8.67	11.3	13.7	16.6	20.1	25.5	31.4	37.6	43.7	49.2	53.4	54.3	54.2	53.6	54.0	54.5	55.0
100	4.71	4.83	5.36	6.31	7.25	8.93	11.6	17.4	23.6	29.1	30.9	31.7	32.0	33.7	35.4	37.0	38.1	38.8	39.3
105	3.55	3.52	4.09	5.24	7.65	10.2	12.3	12.4	11.9	11.3	11.3	11.4	11.6	11.9	12.2	12.6	13.1	13.4	13.7
110	3.10	2.67	3.39	5.26	9.80	14.4	17.8	15.8	12.7	9.97	11.4	13.5	15.7	15.8	15.3	14.6	14.0	13.5	13.3
115	3.79	2.46	2.38	3.54	6.91	10.8	14.5	16.6	17.6	17.2	13.6	9.38	5.68	5.62	6.55	7.94	8.62	9.14	9.43
120	2.90	1.40	1.17	2.19	5.28	9.02	12.8	15.3	17.2	18.3	18.4	17.9	16.9	15.7	14.3	13.0	11.9	11.1	10.9
125	2.12	0.86	0.67	1.56	4.11	7.28	10.6	13.3	15.6	17.4	18.3	18.7	18.7	18.4	18.0	17.5	17.3	17.2	17.2
130	1.53	0.34	0.09	0.78	2.88	5.56	8.44	10.8	12.9	14.8	16.4	17.7	18.6	18.7	18.4	18.0	18.0	17.9	18.0
135	0.64	0.19	0.29	0.95	2.35	4.16	6.20	8.23	10.3	12.2	14.0	15.6	16.9	17.7	18.2	18.6	19.0	19.2	19.3
140	0.34	0.84	1.43	2.10	2.83	3.66	4.64	5.90	7.28	8.71	10.1	11.5	12.7	13.6	14.3	15.0	16.0	16.7	17.2
145	0.31	0.56	0.89	1.31	1.79	2.37	3.06	3.88	4.82	5.87	7.12	8.38	9.52	10.3	10.9	11.3	11.8	12.1	12.2
150	0.30	0.54	0.67	0.71	0.40	0.17	0.22	1.30	2.60	3.89	4.49	4.94	5.34	5.99	6.63	7.20	7.63	7.91	8.02
155	0.31	0.24	0.25	0.33	0.49	0.72	1.01	1.32	1.66	2.05	2.51	2.97	3.40	3.73	4.01	4.22	4.34	4.40	4.41
160	0.35	0.33	0.33	0.34	0.39	0.44	0.47	0.39	0.31	0.28	0.37	0.54	0.82	1.35	1.91	2.40	2.54	2.57	2.53
165	0.38	0.38	0.38	0.38	0.36	0.35	0.36	0.39	0.45	0.52	0.65	0.76	0.81	0.66	0.48	0.30	0.27	0.28	0.31
170	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.39	0.38	0.37	0.37	0.36	0.37	0.38	0.40	0.40	0.40	0.41
175	0.43	0.44	0.44	0.44	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.39	0.39	0.38	0.37	0.37	0.36
180	0.47	0.48	0.48	0.48	0.47	0.47	0.47	0.46	0.46	0.46	0.45	0.44	0.44	0.43	0.42	0.42	0.41	0.40	0.40

C (DEG) γ (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	495	496	496	497	497	497	498	498	498	499	499	499	500	500	500	500	500	500	498
5	583	583	580	563	545	531	541	554	561	539	513	488	483	485	490	493	498	504	466
10	686	687	686	683	679	672	662	648	632	614	593	569	538	509	485	476	476	486	448
15	776	777	776	769	760	750	749	743	730	691	646	599	562	531	506	490	481	480	450
20	898	887	871	854	836	817	802	788	773	762	745	718	658	592	530	494	471	461	445
25	1025	1027	1023	1008	986	956	915	870	823	786	748	708	653	597	542	497	458	424	448
30	1067	1056	1043	1032	1018	1003	987	964	931	872	803	730	665	601	539	481	426	373	396
35	1171	1165	1152	1126	1093	1053	1007	958	908	863	816	765	702	635	564	494	422	349	373
40	1126	1128	1130	1136	1135	1121	1068	1004	934	885	834	778	703	622	539	462	386	311	308
45	950	962	978	1000	1020	1032	1029	1011	974	901	815	727	666	606	545	472	393	307	276
50	841	848	856	857	859	862	882	898	902	871	823	759	678	590	500	420	344	271	219
55	718	723	729	735	742	748	756	762	764	766	756	726	645	548	448	369	298	234	180
60	602	608	615	619	623	627	636	644	647	646	633	605	539	460	377	310	247	189	140
65	431	434	440	447	456	467	481	494	503	510	507	491	443	384	319	264	209	154	114
70	318	316	315	310	306	304	308	315	324	342	355	355	320	273	223	186	152	122	92.4
75	196	196	196	196	196	196	193	191	191	202	212	215	196	171	143	122	104	87.1	65.4
80	99.6	99.6	99.7	99.2	98.8	98.6	98.3	99.0	101	111	119	123	111	95.3	78.2	67.2	58.0	50.8	37.3
85	95.9	93.1	89.5	85.7	81.6	77.4	73.0	68.9	65.6	65.3	64.8	62.9	55.3	46.2	36.8	29.7	23.3	17.8	14.3
90	91.3	90.0	87.6	83.3	77.6	70.4	59.9	49.1	39.4	34.7	31.6	29.0	25.3	21.4	17.4	13.3	8.98	4.59	4.71
95	54.5	54.0	53.6	54.2	54.3	53.4	49.2	43.7	37.6	31.4	25.5	20.1	16.6	13.7	11.3	8.67	6.16	3.79	3.54
100	38.8	38.1	37.0	35.4	33.7	32.0	31.7	30.9	29.1	23.6	17.4	11.6	8.93	7.25	6.31	5.36	4.83	4.71	3.88
105	13.4	13.1	12.6	12.2	11.9	11.6	11.4	11.3	11.3	11.9	12.4	12.3	10.2	7.65	5.24	4.09	3.52	3.55	2.94
110	13.5	14.0	14.6	15.3	15.8	15.7	13.5	11.4	9.97	12.7	15.8	17.8	14.4	9.80	5.26	3.39	2.67	3.10	2.30
115	9.14	8.62	7.94	6.55	5.62	5.68	9.38	13.6	17.2	17.6	16.6	14.5	10.8	6.91	3.54	2.38	2.46	3.79	2.79
120	11.1	11.9	13.0	14.3	15.7	16.9	17.9	18.4	18.3	17.2	15.3	12.8	9.02	5.28	2.19	1.17	1.40	2.90	2.23
125	17.2	17.3	17.5	18.0	18.4	18.7	18.7	18.3	17.4	15.6	13.3	10.6	7.28	4.11	1.56	0.67	0.86	2.12	1.74
130	17.9	18.0	18.0	18.4	18.7	18.6	17.7	16.4	14.8	12.9	10.8	8.44	5.56	2.88	0.78	0.09	0.34	1.53	1.33
135	19.2	19.0	18.6	18.2	17.7	16.9	15.6	14.0	12.2	10.3	8.23	6.20	4.16	2.35	0.95	0.29	0.19	0.64	0.62
140	16.7	16.0	15.0	14.3	13.6	12.7	11.5	10.1	8.71	7.28	5.90	4.64	3.66	2.83	2.10	1.43	0.84	0.34	0.53
145	12.1	11.8	11.3	10.9	10.3	9.52	8.38	7.12	5.87	4.82	3.88	3.06	2.37	1.79	1.31	0.89	0.56	0.31	0.45
150	7.91	7.63	7.20	6.63	5.99	5.34	4.94	4.49	3.89	2.60	1.30	0.22	0.17	0.40	0.71	0.67	0.54	0.30	0.41
155	4.40	4.34	4.22	4.01	3.73	3.40	2.97	2.51	2.05	1.66	1.32	1.01	0.72	0.49	0.33	0.25	0.24	0.31	0.41
160	2.57	2.54	2.40	1.91	1.35	0.82	0.54	0.37	0.28	0.31	0.39	0.47	0.44	0.39	0.34	0.33	0.33	0.35	0.50
165	0.28	0.27	0.30	0.48	0.66	0.81	0.76	0.65	0.52	0.45	0.39	0.36	0.35	0.36	0.38	0.38	0.38	0.38	0.50
170	0.40	0.40	0.40	0.48	0.37	0.36	0.37	0.37	0.38	0.39	0.40	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.50
175	0.37	0.37	0.38	0.39	0.39	0.40	0.41	0.41	0.42	0.42	0.43	0.43	0.44	0.44	0.44	0.44	0.44	0.43	0.50
180	0.40	0.41	0.42	0.42	0.43	0.44	0.44	0.45	0.46	0.46	0.46	0.47	0.47	0.47	0.48	0.48	0.48	0.47	0.50

Table--3

UNIT: ×10cd

C (DEG) γ (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	497	496	496	496	496	495	495	494	494	495	495	496	496	496	496	495	495	495	496
5	437	418	411	410	413	413	414	417	424	432	439	440	438	435	429	424	418	424	429
10	421	405	404	411	421	429	434	436	426	415	405	409	415	420	411	402	395	402	411
15	427	413	413	416	419	412	400	384	359	332	305	283	265	252	246	245	246	245	246
20	431	418	414	406	391	350	302	255	222	195	174	161	152	147	142	139	137	139	142
25	453	439	397	343	285	236	192	156	139	129	126	122	119	117	114	111	109	111	114
30	398	381	330	270	209	172	144	124	114	109	105	98.1	91.2	85.0	80.8	78.0	76.8	78.0	80.8
35	374	350	285	209	139	117	107	104	90.8	78.2	66.9	58.5	51.9	47.0	43.7	41.7	41.1	41.7	43.7
40	293	266	217	164	115	93.9	80.7	72.1	58.9	47.3	37.8	32.2	28.8	27.0	26.0	25.7	26.0	25.7	26.0
45	243	208	168	130	95.3	73.7	57.8	46.6	37.3	30.9	27.0	25.7	25.8	26.7	26.3	25.9	25.7	25.9	26.3
50	175	138	113	92.8	76.9	59.1	43.9	32.0	27.0	24.7	23.7	20.3	17.0	14.3	12.9	12.3	12.2	12.3	12.9
55	135	100.0	78.3	63.9	53.9	42.5	33.0	25.4	19.8	15.7	13.0	11.1	10.1	9.52	9.04	8.84	8.85	8.84	9.04
60	101	71.2	53.8	43.2	36.6	28.3	21.5	16.0	12.1	9.35	7.54	6.51	6.02	5.86	5.47	5.22	5.13	5.22	5.47
65	80.8	55.2	39.6	29.6	23.4	16.9	11.9	8.17	5.25	3.16	1.75	0.85	0.36	0.18	0.13	0.19	0.30	0.19	0.13
70	67.7	47.7	33.1	22.4	14.6	8.74	4.74	2.27	0.84	0.25	0.19	0.07	0.10	0.21	0.27	0.33	0.36	0.33	0.27
75	47.0	32.0	20.9	12.7	7.15	3.89	2.21	1.55	0.77	0.36	0.20	0.12	0.14	0.22	0.29	0.36	0.41	0.36	0.29
80	26.1	17.1	11.0	6.72	3.99	2.29	1.43	1.10	0.64	0.37	0.24	0.19	0.21	0.27	0.35	0.42	0.47	0.42	0.35
85	11.2	8.47	6.01	3.95	2.36	1.54	1.09	0.88	0.61	0.43	0.32	0.28	0.29	0.34	0.43	0.52	0.57	0.52	0.43
90	4.59	4.24	3.48	2.62	1.79	1.35	1.03	0.82	0.63	0.50	0.43	0.39	0.39	0.42	0.50	0.58	0.63	0.58	0.50
95	3.24	2.89	2.46	2.02	1.59	1.25	0.96	0.73	0.59	0.51	0.47	0.44	0.44	0.46	0.54	0.62	0.67	0.62	0.54
100	3.16	2.54	2.05	1.65	1.35	1.13	0.97	0.86	0.75	0.67	0.61	0.57	0.55	0.56	0.63	0.70	0.75	0.70	0.63
105	2.37	1.84	1.31	0.87	0.55	0.50	0.57	0.68	0.74	0.79	0.82	0.82	0.80	0.80	0.85	0.90	0.93	0.90	0.85
110	1.68	1.25	1.09	1.04	1.03	0.87	0.71	0.57	0.54	0.55	0.59	0.65	0.72	0.79	0.85	0.90	0.92	0.90	0.85
115	1.99	1.40	1.09	0.93	0.85	0.73	0.64	0.58	0.57	0.58	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0.61	0.61
120	1.68	1.25	0.98	0.80	0.69	0.60	0.55	0.53	0.54	0.56	0.59	0.60	0.60	0.60	0.61	0.62	0.62	0.62	0.61
125	1.41	1.13	0.91	0.73	0.61	0.54	0.51	0.51	0.54	0.57	0.61	0.62	0.63	0.64	0.65	0.66	0.66	0.66	0.65
130	1.15	0.98	0.82	0.67	0.56	0.52	0.51	0.53	0.55	0.58	0.61	0.64	0.66	0.69	0.70	0.72	0.72	0.72	0.70
135	0.60	0.58	0.57	0.55	0.54	0.54	0.54	0.55	0.58	0.61	0.64	0.66	0.68	0.69	0.71	0.72	0.73	0.72	0.71
140	0.66	0.72	0.69	0.62	0.54	0.54	0.55	0.57	0.59	0.61	0.64	0.66	0.69	0.72	0.74	0.75	0.76	0.75	0.74
145	0.57	0.64	0.63	0.60	0.56	0.56	0.58	0.60	0.62	0.64	0.66	0.69	0.71	0.74	0.75	0.76	0.77	0.76	0.75
150	0.52	0.58	0.59	0.59	0.58	0.59	0.61	0.62	0.64	0.65	0.66	0.69	0.71	0.73	0.73	0.72	0.72	0.72	0.73
155	0.55	0.62	0.65	0.65	0.64	0.63	0.63	0.62	0.63	0.64	0.66	0.68	0.70	0.71	0.70	0.68	0.66	0.68	0.70
160	0.61	0.68	0.70	0.70	0.68	0.67	0.65	0.64	0.65	0.65	0.66	0.66	0.65	0.64	0.64	0.63	0.62	0.63	0.64
165	0.63	0.69	0.71	0.70	0.67	0.66	0.65	0.64	0.63	0.62	0.61	0.58	0.56	0.54	0.54	0.55	0.55	0.55	0.54
170	0.60	0.65	0.66	0.64	0.61	0.58	0.55	0.52	0.51	0.50	0.50	0.48	0.47	0.46	0.46	0.45	0.45	0.45	0.46
175	0.57	0.60	0.61	0.60	0.57	0.53	0.50	0.46	0.46	0.46	0.46	0.44	0.43	0.41	0.41	0.42	0.43	0.42	0.41
180	0.48	0.48	0.48	0.48	0.48	0.47	0.46	0.45	0.44	0.42	0.41	0.41	0.40	0.40	0.40	0.41	0.41	0.41	0.40

Table--4

UNIT: ×10cd

C (DBG) γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	496	496	496	495	495	494	494	495	495	496	496	496	496	497	498				
5	435	438	440	439	432	424	417	414	413	413	410	411	418	437	466				
10	420	415	409	405	415	426	436	434	429	421	411	404	405	421	448				
15	252	265	283	305	332	359	384	400	412	419	416	413	413	427	450				
20	147	152	161	174	195	222	255	302	350	391	406	414	418	431	445				
25	117	119	122	126	129	139	156	192	236	285	343	397	439	453	448				
30	85.0	91.2	98.1	105	109	114	124	144	172	209	270	330	381	398	396				
35	47.0	51.9	58.5	66.9	78.2	90.8	104	107	117	139	209	285	350	374	373				
40	27.0	28.8	32.2	37.8	47.3	58.9	72.1	80.7	93.9	115	164	217	266	293	308				
45	26.7	25.8	25.7	27.0	30.9	37.3	46.6	57.8	73.7	95.3	130	168	208	243	276				
50	14.3	17.0	20.3	23.7	24.7	27.0	32.0	43.9	59.1	76.9	92.8	113	138	175	219				
55	9.52	10.1	11.1	13.0	15.7	19.8	25.4	33.0	42.5	53.9	63.9	78.3	100.0	135	180				
60	5.86	6.02	6.51	7.54	9.35	12.1	16.0	21.5	28.3	36.6	43.2	53.8	71.2	101	140				
65	0.18	0.36	0.85	1.75	3.16	5.25	8.17	11.9	16.9	23.4	29.6	39.6	55.2	80.8	114				
70	0.21	0.10	0.07	0.19	0.25	0.84	2.27	4.74	8.74	14.6	22.4	33.1	47.7	67.7	92.4				
75	0.22	0.14	0.12	0.20	0.36	0.77	1.55	2.21	3.89	7.15	12.7	20.9	32.0	47.0	65.4				
80	0.27	0.21	0.19	0.24	0.37	0.64	1.10	1.43	2.29	3.99	6.72	11.0	17.1	26.1	37.3				
85	0.34	0.29	0.28	0.32	0.43	0.61	0.88	1.09	1.54	2.36	3.95	6.01	8.47	11.2	14.3				
90	0.42	0.39	0.39	0.43	0.50	0.63	0.82	1.03	1.35	1.79	2.62	3.48	4.24	4.59	4.71				
95	0.46	0.44	0.44	0.47	0.51	0.59	0.73	0.96	1.25	1.59	2.02	2.46	2.89	3.24	3.54				
100	0.56	0.55	0.57	0.61	0.67	0.75	0.86	0.97	1.13	1.35	1.65	2.05	2.54	3.16	3.88				
105	0.80	0.80	0.82	0.82	0.79	0.74	0.68	0.57	0.50	0.55	0.87	1.31	1.84	2.37	2.94				
110	0.79	0.72	0.65	0.59	0.55	0.54	0.57	0.71	0.87	1.03	1.04	1.09	1.25	1.68	2.30				
115	0.60	0.60	0.60	0.60	0.58	0.57	0.58	0.64	0.73	0.85	0.93	1.09	1.40	1.99	2.79				
120	0.60	0.60	0.60	0.59	0.56	0.54	0.53	0.55	0.60	0.69	0.80	0.98	1.25	1.68	2.23				
125	0.64	0.63	0.62	0.61	0.57	0.54	0.51	0.51	0.54	0.61	0.73	0.91	1.13	1.41	1.74				
130	0.69	0.66	0.64	0.61	0.58	0.55	0.53	0.51	0.52	0.56	0.67	0.82	0.98	1.15	1.33				
135	0.69	0.68	0.66	0.64	0.61	0.58	0.55	0.54	0.54	0.54	0.55	0.57	0.58	0.60	0.62				
140	0.72	0.69	0.66	0.64	0.61	0.59	0.57	0.55	0.54	0.54	0.62	0.69	0.72	0.66	0.53				
145	0.74	0.71	0.69	0.66	0.64	0.62	0.60	0.58	0.56	0.56	0.60	0.63	0.64	0.57	0.46				
150	0.73	0.71	0.69	0.66	0.65	0.64	0.62	0.61	0.59	0.58	0.59	0.59	0.58	0.52	0.42				
155	0.71	0.70	0.68	0.66	0.64	0.63	0.62	0.63	0.64	0.64	0.65	0.65	0.62	0.55	0.45				
160	0.64	0.65	0.66	0.66	0.65	0.65	0.64	0.65	0.67	0.68	0.70	0.70	0.68	0.61	0.50				
165	0.54	0.56	0.58	0.61	0.62	0.63	0.64	0.65	0.66	0.67	0.70	0.71	0.69	0.63	0.52				
170	0.46	0.47	0.48	0.50	0.50	0.51	0.52	0.55	0.58	0.61	0.64	0.66	0.65	0.60	0.52				
175	0.41	0.43	0.44	0.46	0.46	0.46	0.46	0.50	0.53	0.57	0.60	0.61	0.60	0.57	0.51				
180	0.40	0.40	0.41	0.41	0.42	0.44	0.45	0.46	0.47	0.48	0.48	0.48	0.48	0.48	0.48				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	WPX3 @ 130W / 5000K 480	Sample ID	231020002-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(%)
480.0	60	0.298	129.2	0.904	13.54

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*****