

Photometric Test Report

Relevant Standards

- ☒ ANSI/IES LM-79-2019
- ☒ ANSI C82.77-2017

Prepared For

RAB Lighting Inc.

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Date: 2024-12-25

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Issue Date: 2024-12-25

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

Architectural Flood and Spot Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	1000		991
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	106.6
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		9.3
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	14.87
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	0.9	120V	0.989
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019	7 steps	3045±175	3082
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥70		82.7
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	N/A		7
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		98
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-11%
Zonal Lumen Requirement (0°-90°) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	≥85%		100.0%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Cast		120.0
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Input Current (A)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		0.078
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		9.3
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A

2.0 Test List

Test Item	Test	Test Date	Model Number	Build Level	Sample No.
1	Integrating Sphere Test	2024-12-24	BULLET12 @9W3000K	ES 1st ES #3-1	241216012-S1
2	Goniophotometer Test	2024-12-24	BULLET12 @9W3000K	ES 1st ES #3-1	241216012-S1
3	THD and PF Test	2024-12-24	BULLET12 @9W3000K	ES 1st ES #3-1	241216012-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 must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

3.0 Product Description

Luminaire Description: Model No. BULLET12 @9W3000K, color tunable from 3000K, 4000K and 5000K.

Electrical Specification: 120Vac, 60Hz

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	BULLET12 @9W3000K	Sample ID	241216012-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

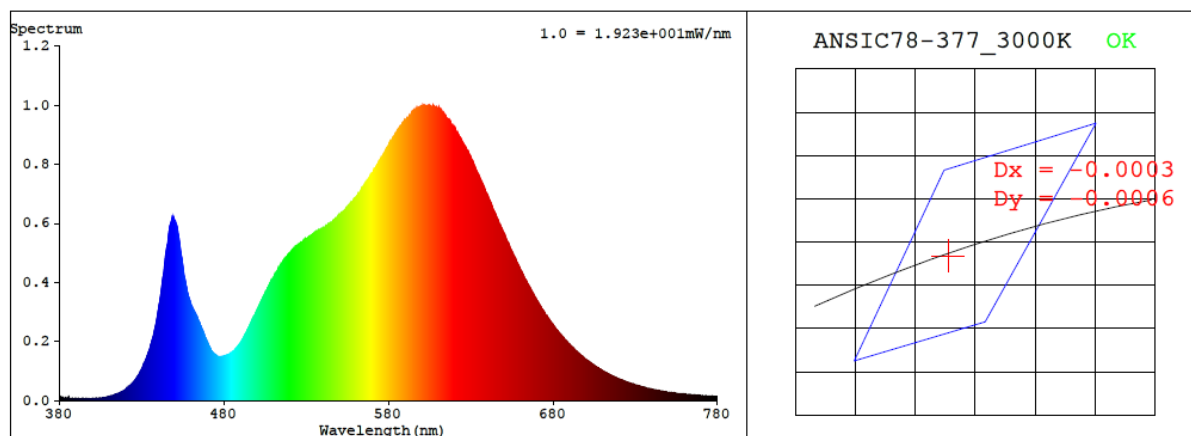
Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.</p> <p>The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780nm.</p>

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.078	9.3	0.989

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3082	82.7	7	-0.0002	84	98	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4310$ $y = 0.4015$ / $u' = 0.2478$ $v' = 0.5195$ ($duv = -1.90e-04$)

CCT= 3082K Prcp WL: $L_d = 582.5\text{nm}$ Purity=49.9%

Peak WL: $L_p = 605\text{nm}$ FWHM: $= 135.5\text{nm}$ Ratio: R=22.5% G=75.2% B=2.3%

Render Index: $R_a = 82.7$ AvgR = 76.6 TM30: $R_f = 83$ $R_g = 97$

EEL: 0.12568 A+

R1 =81 R2 =89 R3 =96 R4 =82 R5 =81 R6 =87 R7 =84

R8 =60 R9 =7 R10=75 R11=82 R12=68 R13=83 R14=98 R15=74

4.1 Integrating Sphere Test

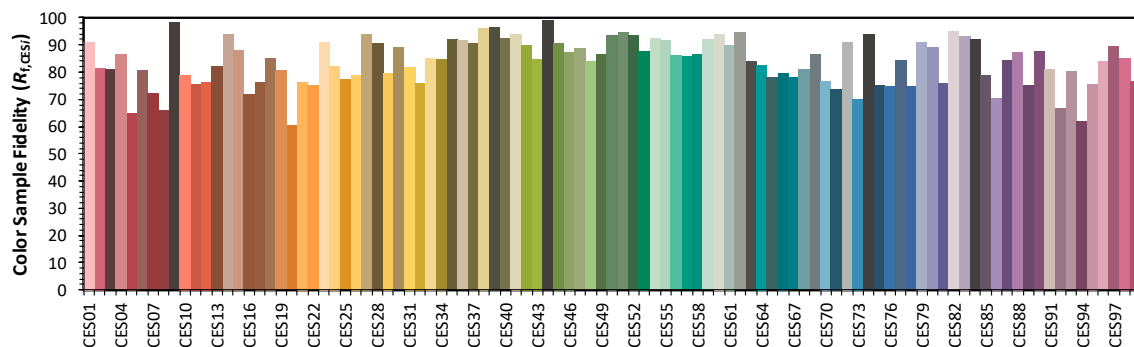
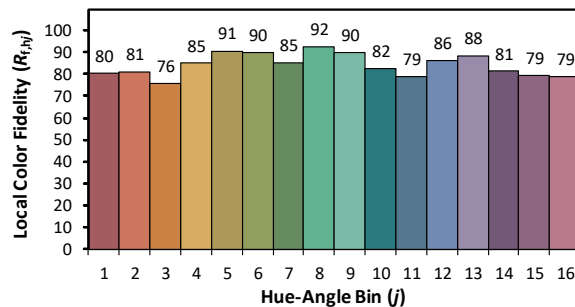
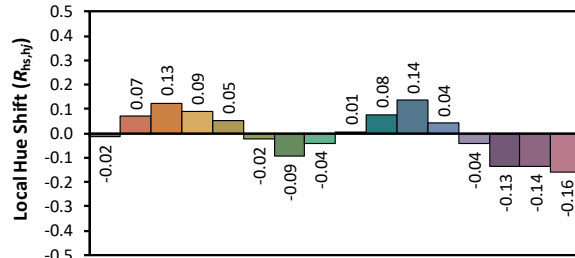
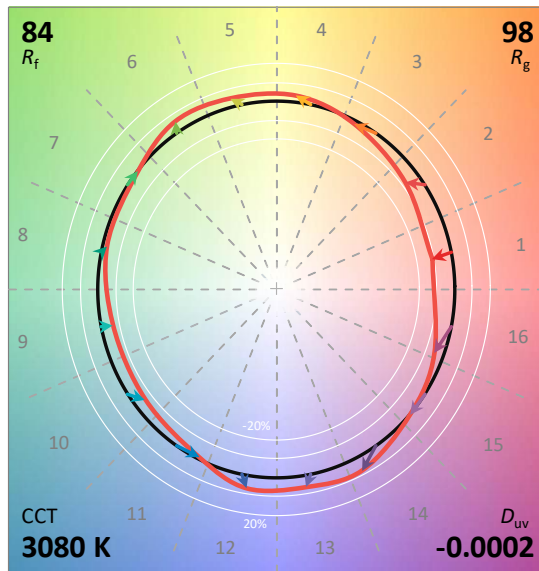
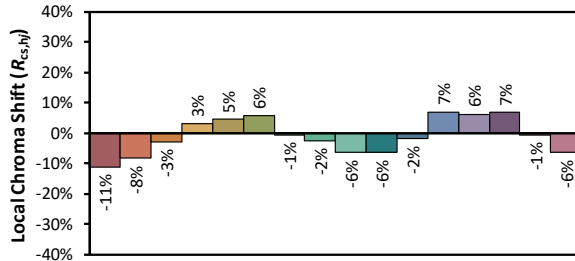
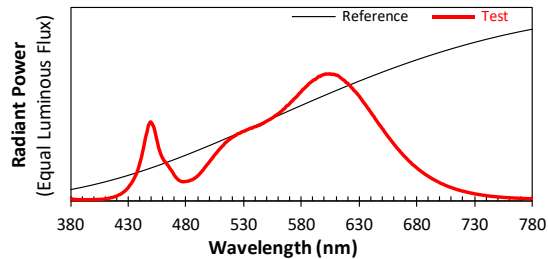
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/12/25

Model: BULLET12 @9W3000K



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

x 0.4310
 y 0.4014
 u' 0.2479
 v' 0.5194

CIE 13.3-1995
(CRI)

R_a 83
 R_g 7

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	1.04E-05	447	5.88E-04	514	4.57E-04	581	8.76E-04	648	5.92E-04	715	8.59E-05
381	1.27E-05	448	6.07E-04	515	4.63E-04	582	8.81E-04	649	5.81E-04	716	8.37E-05
382	1.01E-05	449	6.21E-04	516	4.72E-04	583	8.91E-04	650	5.68E-04	717	8.12E-05
383	8.50E-06	450	6.11E-04	517	4.79E-04	584	9.00E-04	651	5.56E-04	718	7.86E-05
384	9.30E-06	451	5.95E-04	518	4.86E-04	585	9.07E-04	652	5.41E-04	719	7.59E-05
385	8.20E-06	452	5.74E-04	519	4.94E-04	586	9.18E-04	653	5.30E-04	720	7.37E-05
386	6.90E-06	453	5.39E-04	520	4.98E-04	587	9.27E-04	654	5.16E-04	721	7.14E-05
387	7.50E-06	454	4.96E-04	521	5.05E-04	588	9.33E-04	655	5.05E-04	722	6.95E-05
388	7.70E-06	455	4.60E-04	522	5.10E-04	589	9.41E-04	656	4.93E-04	723	6.70E-05
389	5.90E-06	456	4.18E-04	523	5.15E-04	590	9.47E-04	657	4.82E-04	724	6.52E-05
390	7.20E-06	457	3.90E-04	524	5.23E-04	591	9.54E-04	658	4.69E-04	725	6.24E-05
391	5.90E-06	458	3.63E-04	525	5.27E-04	592	9.56E-04	659	4.58E-04	726	6.08E-05
392	6.50E-06	459	3.43E-04	526	5.30E-04	593	9.64E-04	660	4.46E-04	727	5.91E-05
393	6.20E-06	460	3.26E-04	527	5.34E-04	594	9.72E-04	661	4.35E-04	728	5.72E-05
394	7.20E-06	461	3.11E-04	528	5.40E-04	595	9.80E-04	662	4.24E-04	729	5.53E-05
395	6.10E-06	462	3.03E-04	529	5.45E-04	596	9.78E-04	663	4.12E-04	730	5.29E-05
396	6.90E-06	463	2.90E-04	530	5.46E-04	597	9.85E-04	664	4.03E-04	731	5.16E-05
397	6.80E-06	464	2.78E-04	531	5.51E-04	598	9.90E-04	665	3.92E-04	732	5.01E-05
398	6.70E-06	465	2.66E-04	532	5.55E-04	599	9.93E-04	666	3.81E-04	733	4.87E-05
399	6.80E-06	466	2.51E-04	533	5.60E-04	600	9.96E-04	667	3.71E-04	734	4.67E-05
400	7.30E-06	467	2.39E-04	534	5.62E-04	601	9.99E-04	668	3.60E-04	735	4.57E-05
401	7.40E-06	468	2.26E-04	535	5.69E-04	602	9.98E-04	669	3.50E-04	736	4.42E-05
402	8.20E-06	469	2.09E-04	536	5.72E-04	603	9.98E-04	670	3.42E-04	737	4.26E-05
403	8.50E-06	470	1.95E-04	537	5.71E-04	604	9.99E-04	671	3.33E-04	738	4.14E-05
404	8.50E-06	471	1.84E-04	538	5.77E-04	605	9.99E-04	672	3.23E-04	739	4.03E-05
405	8.90E-06	472	1.73E-04	539	5.81E-04	606	9.96E-04	673	3.13E-04	740	3.89E-05
406	9.50E-06	473	1.65E-04	540	5.83E-04	607	9.98E-04	674	3.05E-04	741	3.73E-05
407	1.05E-05	474	1.59E-04	541	5.85E-04	608	9.95E-04	675	2.96E-04	742	3.64E-05
408	1.07E-05	475	1.53E-04	542	5.91E-04	609	9.94E-04	676	2.86E-04	743	3.51E-05
409	1.22E-05	476	1.50E-04	543	5.94E-04	610	9.89E-04	677	2.80E-04	744	3.44E-05
410	1.36E-05	477	1.48E-04	544	5.96E-04	611	9.88E-04	678	2.73E-04	745	3.32E-05
411	1.49E-05	478	1.49E-04	545	6.02E-04	612	9.83E-04	679	2.65E-04	746	3.24E-05
412	1.66E-05	479	1.50E-04	546	6.06E-04	613	9.74E-04	680	2.57E-04	747	3.11E-05
413	1.84E-05	480	1.51E-04	547	6.11E-04	614	9.68E-04	681	2.49E-04	748	3.05E-05
414	2.08E-05	481	1.53E-04	548	6.17E-04	615	9.60E-04	682	2.41E-04	749	2.96E-05
415	2.30E-05	482	1.54E-04	549	6.23E-04	616	9.53E-04	683	2.35E-04	750	2.87E-05
416	2.45E-05	483	1.58E-04	550	6.28E-04	617	9.48E-04	684	2.28E-04	751	2.78E-05
417	2.74E-05	484	1.61E-04	551	6.33E-04	618	9.39E-04	685	2.22E-04	752	2.75E-05
418	3.07E-05	485	1.64E-04	552	6.38E-04	619	9.30E-04	686	2.15E-04	753	2.67E-05
419	3.31E-05	486	1.68E-04	553	6.43E-04	620	9.26E-04	687	2.08E-04	754	2.57E-05
420	3.68E-05	487	1.75E-04	554	6.49E-04	621	9.14E-04	688	2.02E-04	755	2.50E-05
421	4.26E-05	488	1.80E-04	555	6.54E-04	622	9.07E-04	689	1.96E-04	756	2.44E-05
422	4.56E-05	489	1.88E-04	556	6.61E-04	623	8.94E-04	690	1.91E-04	757	2.38E-05
423	5.00E-05	490	1.95E-04	557	6.69E-04	624	8.86E-04	691	1.85E-04	758	2.34E-05
424	5.65E-05	491	2.05E-04	558	6.72E-04	625	8.74E-04	692	1.80E-04	759	2.28E-05
425	6.30E-05	492	2.14E-04	559	6.81E-04	626	8.65E-04	693	1.74E-04	760	2.19E-05
426	6.89E-05	493	2.26E-04	560	6.86E-04	627	8.56E-04	694	1.69E-04	761	2.16E-05
427	7.75E-05	494	2.34E-04	561	6.94E-04	628	8.45E-04	695	1.64E-04	762	2.11E-05
428	8.55E-05	495	2.47E-04	562	7.02E-04	629	8.34E-04	696	1.59E-04	763	2.07E-05
429	9.58E-05	496	2.60E-04	563	7.08E-04	630	8.23E-04	697	1.54E-04	764	1.99E-05
430	1.06E-04	497	2.71E-04	564	7.19E-04	631	8.10E-04	698	1.49E-04	765	1.93E-05
431	1.20E-04	498	2.84E-04	565	7.24E-04	632	7.98E-04	699	1.45E-04	766	1.95E-05
432	1.31E-04	499	2.93E-04	566	7.34E-04	633	7.85E-04	700	1.39E-04	767	1.87E-05
433	1.45E-04	500	3.05E-04	567	7.46E-04	634	7.71E-04	701	1.35E-04	768	1.83E-05
434	1.61E-04	501	3.17E-04	568	7.51E-04	635	7.61E-04	702	1.31E-04	769	1.77E-05
435	1.78E-04	502	3.28E-04	569	7.58E-04	636	7.48E-04	703	1.28E-04	770	1.70E-05
436	1.97E-04	503	3.40E-04	570	7.69E-04	637	7.35E-04	704	1.23E-04	771	1.70E-05
437	2.16E-04	504	3.53E-04	571	7.79E-04	638	7.23E-04	705	1.19E-04	772	1.67E-05
438	2.42E-04	505	3.64E-04	572	7.87E-04	639	7.10E-04	706	1.15E-04	773	1.63E-05
439	2.71E-04	506	3.74E-04	573	7.97E-04	640	6.97E-04	707	1.12E-04	774	1.59E-05
440	3.05E-04	507	3.85E-04	574	8.07E-04	641	6.83E-04	708	1.08E-04	775	1.53E-05
441	3.39E-04	508	3.97E-04	575	8.14E-04	642	6.71E-04	709	1.05E-04	776	1.51E-05
442	3.79E-04	509	4.07E-04	576	8.23E-04	643	6.59E-04	710	1.02E-04	777	1.50E-05
443	4.20E-04	510	4.16E-04	577	8.34E-04	644	6.43E-04	711	9.82E-05	778	1.47E-05
444	4.66E-04	511	4.27E-04	578	8.44E-04	645	6.32E-04	712	9.54E-05	779	1.47E-05
445	5.11E-04	512	4.34E-04	579	8.54E-04	646	6.17E-04	713	9.21E-05	780	1.47E-05
446	5.42E-04	513	4.47E-04	580	8.62E-04	647	6.04E-04	714	8.92E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	BULLET12 @9W3000K	Sample ID	241216012-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	24.8	Humidity (%RH)	40.1

Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</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

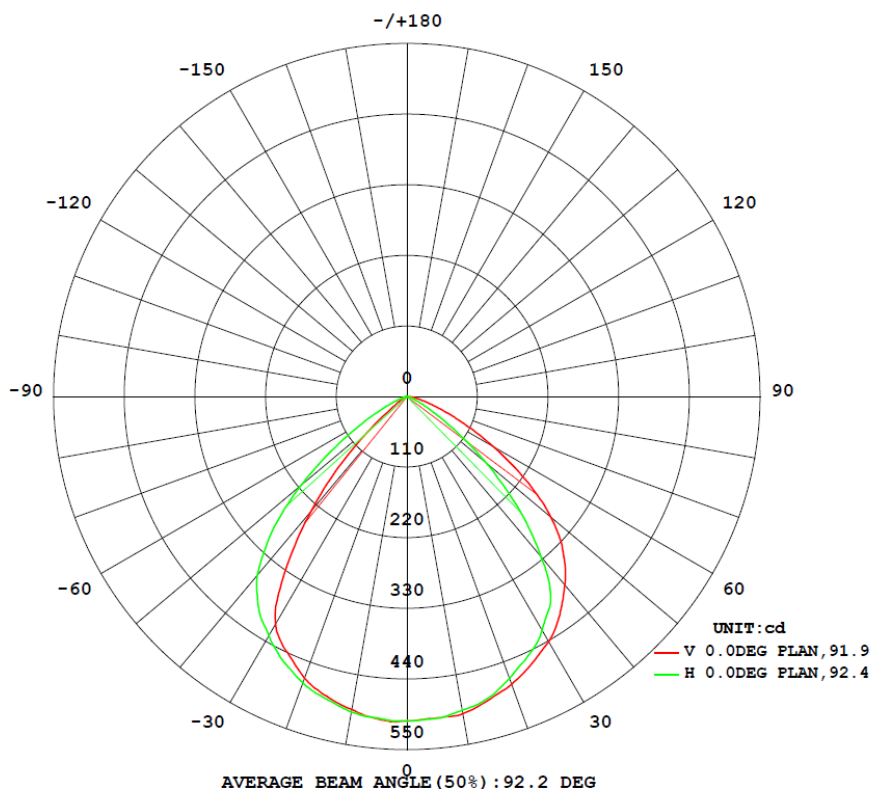
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.078	9.3	0.989
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

Test Result

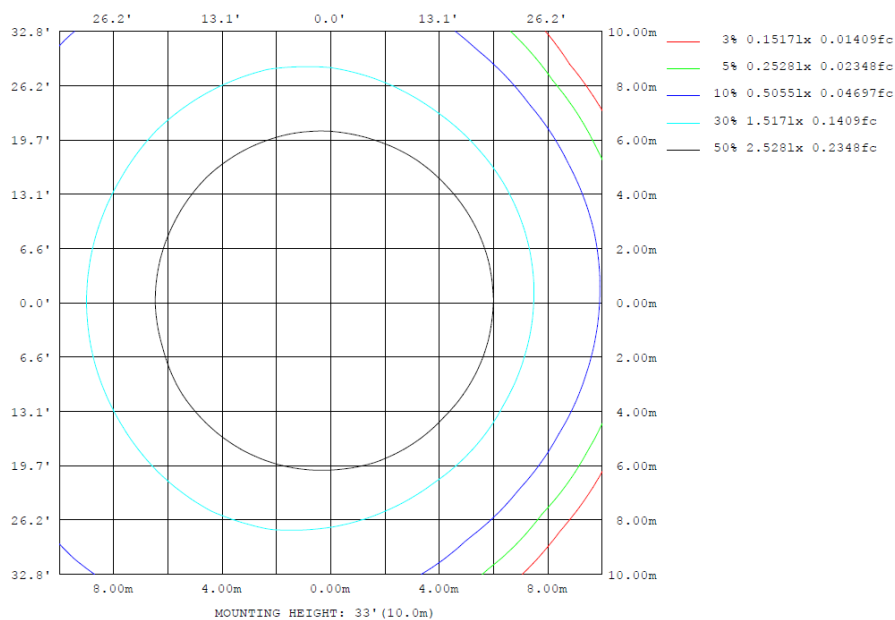
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	NEMA Type
	C0-180	C90-270	C0-180	C90-270		(0°-90°)	
991	123.4	123.4	91.6	90.8	106.6	100.0%	6H x 6V

4.2 Goniophotometer Test

Lighting Distribution Curve



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	494.9	492.9	496.1	497.3	501.5	499.1	499.0	493.9	0~ 10	47.88	47.88	4.83,4.83
20	466.5	468.5	467.1	475.0	476.8	478.5	474.4	471.3	10~ 20	137.4	185.2	18.7,18.7
30	409.7	404.3	420.7	435.2	441.3	443.6	430.3	413.5	20~ 30	207.8	393.0	39.7,39.7
40	231.5	224.8	324.6	377.2	382.9	386.0	362.3	274.0	30~ 40	236.4	629.5	63.5,63.5
50	55.73	57.35	163.2	279.7	293.0	298.4	216.3	77.42	40~ 50	192.2	821.6	82.9,82.9
60	10.21	14.35	44.95	132.7	154.4	164.4	72.10	16.04	50~ 60	110.0	931.6	94.1,94.1
70	0.0101	0.5340	10.76	40.67	53.01	55.07	14.95	0.6929	60~ 70	44.23	975.9	98.5,98.5
80	0.0099	0.0103	1.857	9.114	13.74	11.82	2.517	0.0162	70~ 80	12.32	988.2	99.8,99.8
90	0	0	0	0	0	0	0	0	80~ 90	2.382	990.6	100,100
100	0	0	0	0	0	0	0	0	90~100	0	990.6	100,100
110	0	0	0	0	0	0	0	0	100~110	0	990.6	100,100
120	0	0	0	0	0	0	0	0	110~120	0	990.6	100,100
130	0	0	0	0	0	0	0	0	120~130	0	990.6	100,100
140	0	0	0	0	0	0	0	0	130~140	0	990.6	100,100
150	0	0	0	0	0	0	0	0	140~150	0	990.6	100,100
160	0	0	0	0	0	0	0	0	150~160	0	990.6	100,100
170	0	0	0	0	0	0	0	0	160~170	0	990.6	100,100
180	0	0	0	0	0	0	0	0	170~180	0	990.6	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

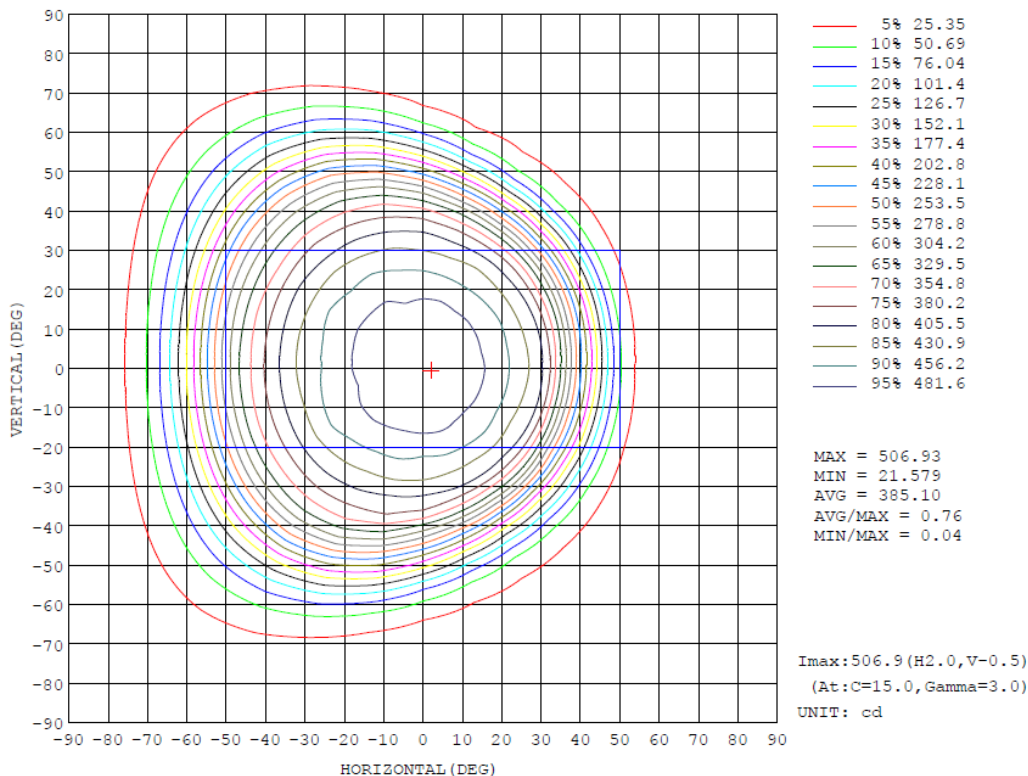
	Zonal (lm)		Total (lm)	Percent
0-10	47.88	0-10	47.88	4.83%
10-20	137.36	0-20	185.24	18.70%
20-30	207.80	0-30	393.04	39.68%
30-40	236.43	0-40	629.47	63.55%
40-50	192.18	0-50	821.65	82.95%
50-60	109.98	0-60	931.63	94.05%
60-70	44.23	0-70	975.86	98.52%
70-80	12.32	0-80	988.18	99.76%
80-90	2.38	0-90	990.56	100.00%
90-100	0.00	0-100	990.56	100.00%
100-110	0.00	0-110	990.56	100.00%
110-120	0.00	0-120	990.56	100.00%
120-130	0.00	0-130	990.56	100.00%
130-140	0.00	0-140	990.56	100.00%
140-150	0.00	0-150	990.56	100.00%
150-160	0.00	0-160	990.56	100.00%
160-170	0.00	0-170	990.56	100.00%
170-180	0.00	0-180	990.56	100.00%

4.2 Goniophotometer Test

Area Flux Diagram

	AREA FLUX DIAGRAM																		UNIT:lm						Φ t	Φ a
VERTICAL (DEG)	90	0.00	0.02	0.04	0.06	0.07	0.08	0.07	0.06	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00					
	80	0.01	0.04	0.10	0.18	0.30	0.40	0.46	0.41	0.30	0.18	0.09	0.03	0.01	0.00	0.00	0.00	0.00	0.00	2.50	0.00					
	70	0.01	0.06	0.19	0.45	0.87	1.37	1.77	1.81	1.43	0.89	0.46	0.21	0.06	0.01	0.00	0.00	0.00	0.00	9.61	4.93					
	60	0.01	0.09	0.34	0.92	1.98	3.37	4.61	5.16	4.73	3.46	1.88	0.81	0.33	0.08	0.00	0.00	0.00	0.00	27.8	25.4					
	50	0.02	0.13	0.54	1.61	3.56	5.95	7.95	9.13	9.27	8.11	5.71	2.85	0.97	0.31	0.04	0.00	0.00	0.00	56.1	54.5					
	40	0.02	0.17	0.78	2.42	5.16	7.92	10.1	11.6	12.2	11.8	9.97	6.64	2.81	0.69	0.15	0.00	0.00	0.00	82.4	81.3					
	30	0.02	0.21	1.01	3.17	6.32	9.17	11.5	13.1	13.8	13.6	12.4	9.83	5.40	1.49	0.26	0.02	0.00	0.00	101	100					
		0.02	0.24	1.19	3.70	7.03	9.94	12.4	13.9	14.7	14.7	13.6	11.4	7.29	2.46	0.37	0.03	0.00	0.00	113	112					
		0.02	0.25	1.28	3.95	7.35	10.3	12.7	14.3	15.2	15.1	14.1	12.1	8.14	2.98	0.44	0.04	0.00	0.00	118	117					
		0.02	0.25	1.27	3.90	7.32	10.2	12.6	14.3	15.2	15.1	14.1	12.0	7.95	2.86	0.43	0.04	0.00	0.00	118	117					
	0.02	0.23	1.14	3.55	6.93	9.83	12.3	13.8	14.6	14.6	13.5	11.2	6.68	2.15	0.35	0.03	0.00	0.00	111	110						
	0.02	0.20	0.94	2.94	6.08	9.01	11.3	12.8	13.5	13.3	12.1	9.08	4.45	1.23	0.25	0.02	0.00	0.00	97.3	96.3						
	0.02	0.16	0.70	2.15	4.73	7.61	9.84	11.2	11.7	11.1	8.86	5.30	2.12	0.58	0.13	0.00	0.00	0.00	76.3	75.0						
	0.02	0.12	0.48	1.38	3.03	5.24	7.16	8.16	7.96	6.53	4.23	2.01	0.77	0.28	0.04	0.00	0.00	0.00	47.4	45.5						
	0.01	0.09	0.30	0.76	1.56	2.60	3.55	3.89	3.40	2.36	1.30	0.65	0.30	0.07	0.00	0.00	0.00	0.00	20.8	17.8						
	0.01	0.06	0.17	0.37	0.65	0.95	1.16	1.13	0.91	0.61	0.37	0.18	0.05	0.00	0.00	0.00	0.00	0.00	6.64	1.39						
	0.01	0.04	0.09	0.16	0.23	0.28	0.29	0.26	0.20	0.13	0.07	0.03	0.01	0.00	0.00	0.00	0.00	0.00	1.78	0.00						
	0.00	0.02	0.04	0.05	0.06	0.06	0.06	0.04	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00						
	-90	-90	-80	-70	-60	-50	-40	-30	-20	HORIZONTAL	(DEG)	20	30	40	50	60	70	80	90							
	Φ t	0.27	2.37	10.6	31.7	63.3	94.3	120	135	139	132	113	84.4	47.3	15.2	2.47	0.20	0.00	0.00	0.00	990	---				
Φ a	0.00	0.00	7.90	29.5	61.2	92.4	118	133	137	130	111	82.1	45.1	12.5	0.00	0.00	0.00	0.00	0.00	---	959					

Isocandela



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

H (DEG)	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
V (DEG)	-180	-170	-160	-150	-140	-130	-120	-110	-100	-90	-80	-70	-60	-50	-40	-30	-20	-10	0
-180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-80	0.00	2.00	2.91	3.63	4.21	4.70	5.14	5.38	5.56	5.61	5.50	5.24	4.83	4.45	3.99	3.40	2.93	2.42	1.86
-70	0.00	3.00	4.56	6.09	7.77	9.45	11.4	13.4	15.6	17.7	19.4	20.3	20.6	20.3	19.1	17.1	15.4	13.3	10.8
-60	0.00	3.78	6.14	8.97	12.3	16.9	22.9	30.0	37.7	46.4	55.6	63.5	70.2	74.9	74.3	72.1	66.3	57.0	45.0
-50	0.00	4.50	7.86	12.3	18.9	28.3	40.9	57.6	78.5	101	128	154	176	195	203	205	199	184	163
-40	0.00	5.12	9.49	16.3	27.0	42.8	66.3	97.3	136	180	224	265	296	320	337	344	348	340	325
-30	0.00	5.65	11.1	20.5	35.8	59.7	95.4	143	199	255	303	339	367	388	402	413	420	422	421
-20	0.00	6.05	12.4	24.2	44.0	76.7	124	185	250	307	350	381	408	430	446	456	465	466	467
-10	0.00	6.30	13.4	26.9	50.2	88.9	145	214	281	335	374	405	431	457	470	482	489	495	496
0	0.00	6.41	13.7	28.1	53.0	94.4	154	225	293	344	383	415	441	459	477	490	501	503	505
10	0.00	6.32	13.5	27.4	51.6	91.5	150	220	287	338	376	408	437	457	473	484	493	497	499
20	0.00	6.08	12.6	25.1	46.4	81.1	132	196	262	314	354	387	414	437	451	464	473	473	474
30	0.00	5.69	11.3	21.8	38.6	65.7	106	158	217	271	313	346	376	395	412	424	431	433	430
40	0.00	5.17	9.72	17.4	29.8	48.3	75.3	112	156	204	249	285	313	335	352	362	370	367	362
50	0.00	4.55	7.99	13.1	21.4	32.3	48.0	68.8	95.0	125	157	187	212	235	246	250	248	235	216
60	0.00	3.84	6.29	9.38	13.5	19.7	27.1	36.7	47.7	60.8	75.3	88.0	99.4	107	110	108	101	88.2	72.1
70	0.00	3.05	4.68	6.34	8.17	10.4	13.1	16.4	20.1	23.9	27.0	29.6	32.0	32.3	31.0	28.3	24.8	20.3	14.9
80	0.00	2.05	3.03	3.81	4.46	5.05	5.63	6.07	6.49	6.86	7.00	6.96	6.81	6.34	5.70	4.84	4.15	3.37	2.52
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

H (DEG) V (DEG)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	UNIT: cd
-180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-80	1.43	0.99	0.56	0.38	0.21	0.07	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.00
-70	9.09	7.26	5.39	3.75	2.20	1.05	0.50	0.16	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.00
-60	37.2	28.9	22.1	17.6	13.1	8.99	5.13	1.96	0.60	0.11	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.00
-50	137	106	78.1	54.0	35.3	26.2	19.2	12.7	6.92	2.28	0.28	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
-40	300	265	221	168	122	78.3	44.8	27.7	18.4	10.2	3.80	0.50	0.01	0.01	0.01	0.01	0.01	0.01	0.00
-30	416	403	374	331	268	192	126	70.9	34.0	19.7	10.2	2.96	0.17	0.01	0.01	0.01	0.01	0.01	0.00
-20	465	457	440	422	385	313	226	142	73.1	29.7	16.2	6.65	0.84	0.01	0.01	0.01	0.01	0.01	0.00
-10	492	484	474	453	428	389	299	205	114	45.3	20.4	9.32	1.75	0.01	0.01	0.01	0.01	0.01	0.00
0	505	495	483	466	440	410	330	232	135	55.7	22.0	10.2	2.13	0.01	0.01	0.01	0.01	0.01	0.00
10	494	487	476	458	431	396	318	222	126	48.8	21.1	9.54	1.82	0.01	0.01	0.01	0.01	0.01	0.00
20	471	461	445	427	398	342	262	171	85.9	32.9	17.2	6.88	0.91	0.01	0.01	0.01	0.01	0.01	0.00
30	424	413	394	362	310	241	164	89.8	40.6	21.6	11.0	3.27	0.20	0.01	0.01	0.01	0.01	0.02	0.00
40	343	316	275	226	169	109	60.7	33.0	20.5	11.2	4.25	0.59	0.01	0.01	0.01	0.01	0.02	0.02	0.00
50	188	153	116	79.2	48.8	32.0	21.9	14.2	7.66	2.65	0.34	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.00
60	57.0	40.7	27.9	20.9	14.9	10.0	5.81	2.31	0.73	0.16	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.00
70	12.2	9.31	6.54	4.56	2.70	1.31	0.64	0.22	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00
80	1.93	1.32	0.73	0.49	0.27	0.10	0.06	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.00
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	BULLET12 @9W3000K	Sample ID	241216012-S1
Temperature (°C)	25.4	Humidity (%RH)	41.0

Test Method
<p>The samples were tested according to the and Ansi C82.77: 2002 and ANSI C82.77-10:2020</p> <p>The total harmonic distortion shall be measured to the 40th order.</p> <p>The ambient temperature shall be maintained at $25 \pm 1^\circ\text{C}$. 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	0.078	9.3	0.989	14.87

5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2024-11-07	2025-11-06
NTC-F01-006	2.0 meter Integrating Sphere	2024-11-07	2025-11-06
NTC-F01-012	Standard Lamp	2024-10-28	2025-10-27
NTC-F01-013	Standard Lamp	2024-10-28	2025-10-27
NTC-F01-031	Digital Power Meter	2024-08-06	2025-08-05
NTC-F01-019	Temperature & Humidity Meter	2024-10-29	2025-10-28

*****End of Report*****