

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

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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		1064
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	113.2
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		9.4
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	14.53
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	0.9	120V	0.990
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019	7 steps	3985±275	3913
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥70		84.4
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	N/A		17
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		0.079
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		9.4
(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 @9W4000K	ES 1st ES #3-1	241216012-S1
2	Goniophotometer Test	2024-12-24	BULLET12 @9W4000K	ES 1st ES #3-1	241216012-S1
3	THD and PF Test	2024-12-24	BULLET12 @9W4000K	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 @9W4000K, 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 @9W4000K	Sample ID	241216012-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

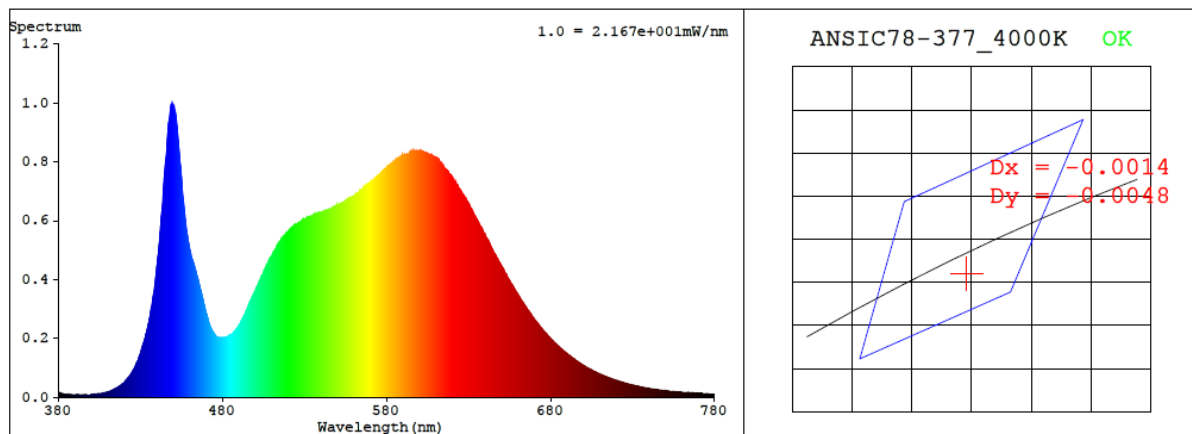
Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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	0.079	9.4	0.990

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3913	84.4	17	-0.0019	84	98	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3830$ $y = 0.3744$ / $u' = 0.2277$ $v' = 0.5009$ ($duv = -1.85e-03$)

CCT= 3913K Prcp WL: Ld=580.4nm Purity=27.3%

Peak WL: Lp=449nm FWHM: =19.3nm Ratio:R=19.1% G=77.6% B=3.3%

Render Index: Ra = 84.4 AvgR = 78.3 TM30:Rf=84 Rg=98

EEL: 0.11977 A+

R1 =84 R2 =90 R3 =93 R4 =85 R5 =84 R6 =85 R7 =87

R8 =68 R9 =17 R10=75 R11=84 R12=64 R13=85 R14=96 R15=78

4.1 Integrating Sphere Test

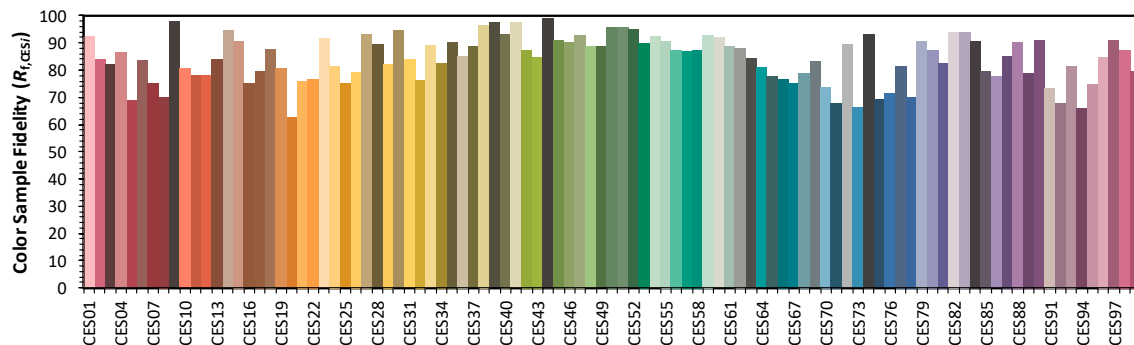
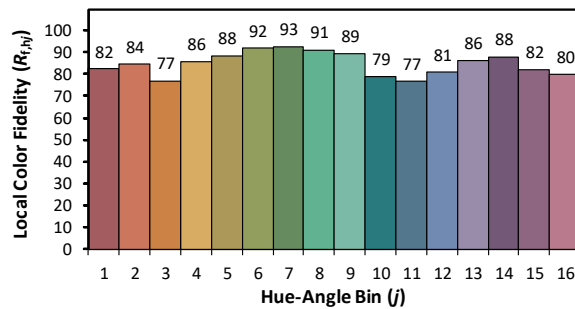
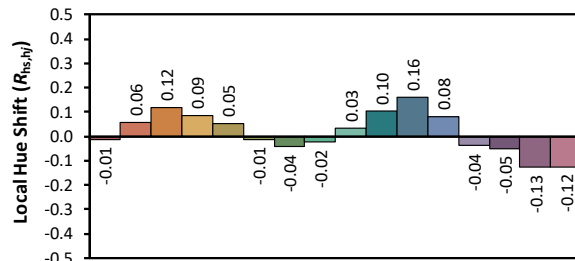
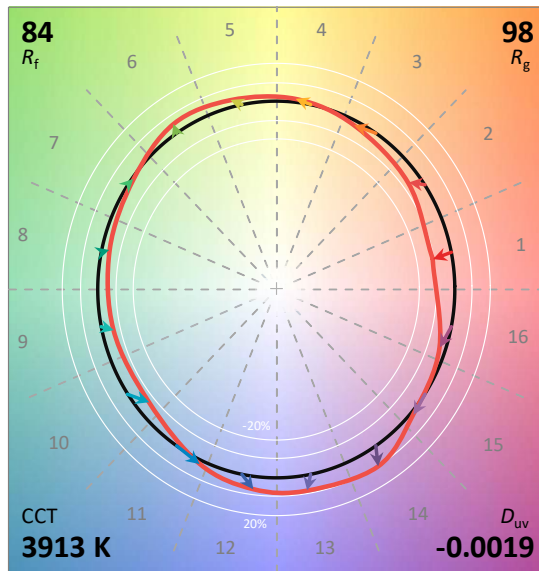
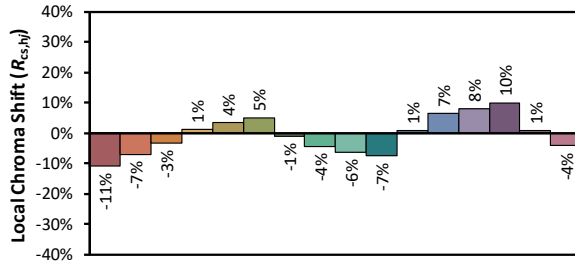
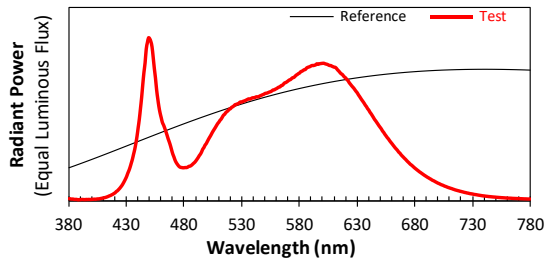
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/12/25

Model: BULLET12 @9W4000K



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

x 0.3829
 y 0.3742
 u' 0.2278
 v' 0.5008

CIE 13.3-1995
(CRI)

R_a 84
 R_g 17

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	1.33E-05	447	9.24E-04	514	5.22E-04	581	7.86E-04	648	4.66E-04	715	6.69E-05
381	1.28E-05	448	9.63E-04	515	5.27E-04	582	7.89E-04	649	4.56E-04	716	6.51E-05
382	1.11E-05	449	9.92E-04	516	5.37E-04	583	7.93E-04	650	4.47E-04	717	6.29E-05
383	1.13E-05	450	9.86E-04	517	5.43E-04	584	7.98E-04	651	4.37E-04	718	6.13E-05
384	1.04E-05	451	9.69E-04	518	5.50E-04	585	8.00E-04	652	4.25E-04	719	5.91E-05
385	8.70E-06	452	9.38E-04	519	5.58E-04	586	8.08E-04	653	4.16E-04	720	5.75E-05
386	9.40E-06	453	8.75E-04	520	5.61E-04	587	8.12E-04	654	4.05E-04	721	5.56E-05
387	8.50E-06	454	8.07E-04	521	5.69E-04	588	8.15E-04	655	3.96E-04	722	5.39E-05
388	6.70E-06	455	7.48E-04	522	5.73E-04	589	8.17E-04	656	3.85E-04	723	5.18E-05
389	8.00E-06	456	6.76E-04	523	5.78E-04	590	8.21E-04	657	3.78E-04	724	5.05E-05
390	7.50E-06	457	6.21E-04	524	5.85E-04	591	8.24E-04	658	3.67E-04	725	4.86E-05
391	9.00E-06	458	5.73E-04	525	5.87E-04	592	8.24E-04	659	3.58E-04	726	4.73E-05
392	8.60E-06	459	5.35E-04	526	5.90E-04	593	8.26E-04	660	3.49E-04	727	4.56E-05
393	8.00E-06	460	5.06E-04	527	5.92E-04	594	8.28E-04	661	3.40E-04	728	4.40E-05
394	7.90E-06	461	4.77E-04	528	5.99E-04	595	8.34E-04	662	3.31E-04	729	4.30E-05
395	8.90E-06	462	4.62E-04	529	6.02E-04	596	8.31E-04	663	3.22E-04	730	4.18E-05
396	8.40E-06	463	4.43E-04	530	6.01E-04	597	8.34E-04	664	3.14E-04	731	4.01E-05
397	9.10E-06	464	4.23E-04	531	6.06E-04	598	8.35E-04	665	3.06E-04	732	3.88E-05
398	8.60E-06	465	4.01E-04	532	6.08E-04	599	8.36E-04	666	2.97E-04	733	3.80E-05
399	8.70E-06	466	3.78E-04	533	6.11E-04	600	8.37E-04	667	2.90E-04	734	3.66E-05
400	9.50E-06	467	3.58E-04	534	6.15E-04	601	8.37E-04	668	2.81E-04	735	3.53E-05
401	9.80E-06	468	3.36E-04	535	6.18E-04	602	8.35E-04	669	2.73E-04	736	3.42E-05
402	1.06E-05	469	3.10E-04	536	6.21E-04	603	8.33E-04	670	2.66E-04	737	3.31E-05
403	1.02E-05	470	2.86E-04	537	6.19E-04	604	8.31E-04	671	2.59E-04	738	3.19E-05
404	1.13E-05	471	2.68E-04	538	6.23E-04	605	8.27E-04	672	2.52E-04	739	3.09E-05
405	1.21E-05	472	2.48E-04	539	6.27E-04	606	8.24E-04	673	2.44E-04	740	3.02E-05
406	1.25E-05	473	2.34E-04	540	6.28E-04	607	8.24E-04	674	2.37E-04	741	2.91E-05
407	1.37E-05	474	2.23E-04	541	6.28E-04	608	8.20E-04	675	2.31E-04	742	2.83E-05
408	1.54E-05	475	2.14E-04	542	6.32E-04	609	8.17E-04	676	2.23E-04	743	2.75E-05
409	1.65E-05	476	2.07E-04	543	6.34E-04	610	8.14E-04	677	2.18E-04	744	2.65E-05
410	1.81E-05	477	2.04E-04	544	6.33E-04	611	8.12E-04	678	2.12E-04	745	2.59E-05
411	2.00E-05	478	2.03E-04	545	6.36E-04	612	8.06E-04	679	2.06E-04	746	2.52E-05
412	2.18E-05	479	2.02E-04	546	6.40E-04	613	7.97E-04	680	1.99E-04	747	2.45E-05
413	2.44E-05	480	2.02E-04	547	6.43E-04	614	7.90E-04	681	1.94E-04	748	2.38E-05
414	2.72E-05	481	2.03E-04	548	6.46E-04	615	7.81E-04	682	1.88E-04	749	2.33E-05
415	3.05E-05	482	2.03E-04	549	6.49E-04	616	7.74E-04	683	1.83E-04	750	2.27E-05
416	3.30E-05	483	2.06E-04	550	6.54E-04	617	7.70E-04	684	1.77E-04	751	2.18E-05
417	3.69E-05	484	2.10E-04	551	6.55E-04	618	7.61E-04	685	1.72E-04	752	2.15E-05
418	4.02E-05	485	2.12E-04	552	6.57E-04	619	7.53E-04	686	1.67E-04	753	2.06E-05
419	4.51E-05	486	2.16E-04	553	6.60E-04	620	7.48E-04	687	1.62E-04	754	2.03E-05
420	4.95E-05	487	2.22E-04	554	6.63E-04	621	7.38E-04	688	1.57E-04	755	1.96E-05
421	5.68E-05	488	2.28E-04	555	6.65E-04	622	7.32E-04	689	1.53E-04	756	1.93E-05
422	6.15E-05	489	2.35E-04	556	6.70E-04	623	7.20E-04	690	1.48E-04	757	1.88E-05
423	6.89E-05	490	2.43E-04	557	6.75E-04	624	7.11E-04	691	1.43E-04	758	1.83E-05
424	7.65E-05	491	2.53E-04	558	6.76E-04	625	7.02E-04	692	1.40E-04	759	1.77E-05
425	8.55E-05	492	2.63E-04	559	6.80E-04	626	6.94E-04	693	1.35E-04	760	1.74E-05
426	9.48E-05	493	2.75E-04	560	6.83E-04	627	6.86E-04	694	1.31E-04	761	1.70E-05
427	1.07E-04	494	2.85E-04	561	6.88E-04	628	6.76E-04	695	1.26E-04	762	1.66E-05
428	1.20E-04	495	2.98E-04	562	6.92E-04	629	6.66E-04	696	1.23E-04	763	1.64E-05
429	1.33E-04	496	3.15E-04	563	6.94E-04	630	6.58E-04	697	1.20E-04	764	1.59E-05
430	1.49E-04	497	3.24E-04	564	7.01E-04	631	6.46E-04	698	1.16E-04	765	1.53E-05
431	1.68E-04	498	3.39E-04	565	7.03E-04	632	6.36E-04	699	1.12E-04	766	1.51E-05
432	1.85E-04	499	3.48E-04	566	7.10E-04	633	6.25E-04	700	1.08E-04	767	1.47E-05
433	2.05E-04	500	3.62E-04	567	7.18E-04	634	6.14E-04	701	1.05E-04	768	1.46E-05
434	2.29E-04	501	3.75E-04	568	7.20E-04	635	6.04E-04	702	1.02E-04	769	1.42E-05
435	2.53E-04	502	3.87E-04	569	7.25E-04	636	5.94E-04	703	9.82E-05	770	1.37E-05
436	2.84E-04	503	3.99E-04	570	7.30E-04	637	5.82E-04	704	9.59E-05	771	1.36E-05
437	3.13E-04	504	4.13E-04	571	7.36E-04	638	5.73E-04	705	9.26E-05	772	1.33E-05
438	3.50E-04	505	4.25E-04	572	7.38E-04	639	5.61E-04	706	8.94E-05	773	1.30E-05
439	3.93E-04	506	4.36E-04	573	7.44E-04	640	5.53E-04	707	8.71E-05	774	1.27E-05
440	4.46E-04	507	4.47E-04	574	7.49E-04	641	5.40E-04	708	8.40E-05	775	1.23E-05
441	4.97E-04	508	4.59E-04	575	7.51E-04	642	5.31E-04	709	8.13E-05	776	1.22E-05
442	5.62E-04	509	4.71E-04	576	7.58E-04	643	5.19E-04	710	7.91E-05	777	1.19E-05
443	6.29E-04	510	4.79E-04	577	7.65E-04	644	5.08E-04	711	7.66E-05	778	1.15E-05
444	7.09E-04	511	4.90E-04	578	7.69E-04	645	4.96E-04	712	7.46E-05	779	1.16E-05
445	7.82E-04	512	4.98E-04	579	7.75E-04	646	4.87E-04	713	7.18E-05	780	1.16E-05
446	8.40E-04	513	5.10E-04	580	7.78E-04	647	4.77E-04	714	6.95E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	BULLET12 @9W4000K	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

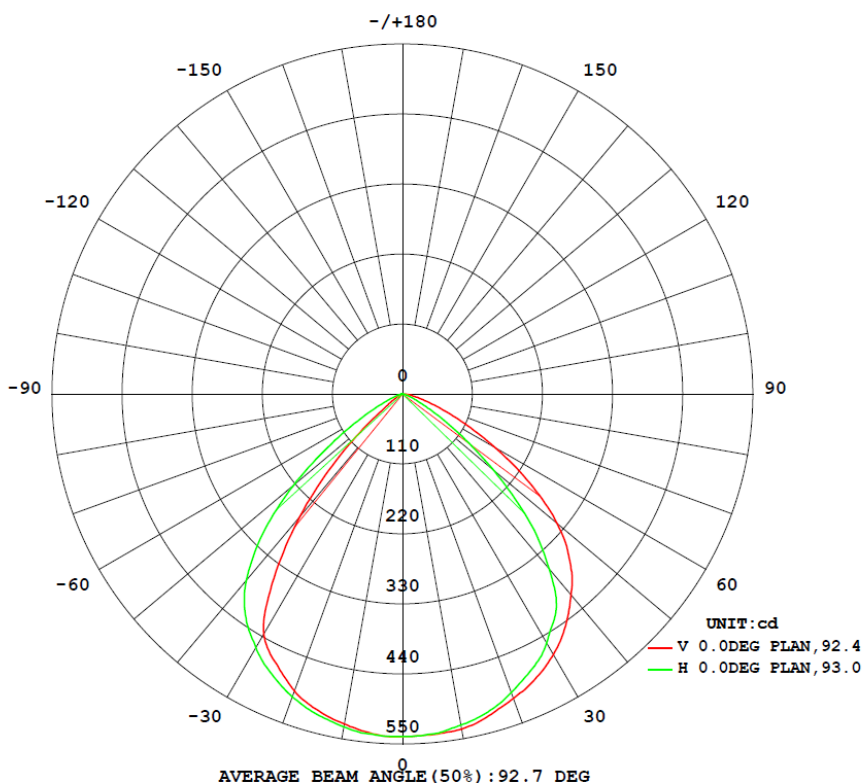
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.079	9.4	0.990
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

Test Result

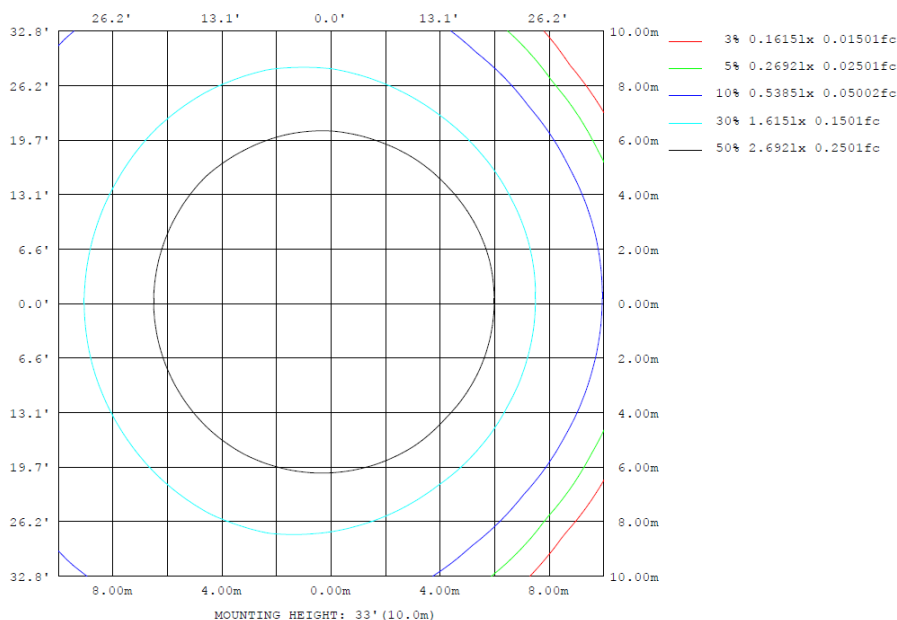
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	NEMA Type
	C0-180	C90-270	C0-180	C90-270		(0°-90°)	
1064	123.7	124.4	92.2	92.4	113.2	100.0%	6H x 6V

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	zone	total	lum, lamp
10	526.4	525.3	528.0	530.0	534.3	532.9	531.3	527.7	0~ 10	50.98	50.98	4.79, 4.79
20	496.6	498.1	498.9	506.6	509.0	512.6	506.2	502.4	10~ 20	146.5	197.5	18.6, 18.6
30	435.9	431.7	452.3	466.6	473.2	475.5	460.4	440.9	20~ 30	222.0	419.5	39.4, 39.4
40	250.0	256.8	357.9	406.1	411.9	414.4	381.8	282.8	30~ 40	253.7	673.1	63.3, 63.3
50	61.18	65.42	188.0	306.7	317.3	319.3	224.0	79.13	40~ 50	207.9	881.0	82.8, 82.8
60	11.19	16.06	53.26	149.8	167.1	172.4	71.88	17.32	50~ 60	119.3	1000	94, 94
70	0.0104	0.5826	12.17	46.16	57.32	57.21	15.49	0.7513	60~ 70	47.80	1048	98.5, 98.5
80	0.0095	0.0109	2.062	10.37	14.80	12.20	2.672	0.0175	70~ 80	13.26	1061	99.8, 99.8
90	0	0	0	0	0	0	0	0	80~ 90	2.564	1064	100, 100
100	0	0	0	0	0	0	0	0	90~ 100	0	1064	100, 100
110	0	0	0	0	0	0	0	0	100~ 110	0	1064	100, 100
120	0	0	0	0	0	0	0	0	110~ 120	0	1064	100, 100
130	0	0	0	0	0	0	0	0	120~ 130	0	1064	100, 100
140	0	0	0	0	0	0	0	0	130~ 140	0	1064	100, 100
150	0	0	0	0	0	0	0	0	140~ 150	0	1064	100, 100
160	0	0	0	0	0	0	0	0	150~ 160	0	1064	100, 100
170	0	0	0	0	0	0	0	0	160~ 170	0	1064	100, 100
180	0	0	0	0	0	0	0	0	170~ 180	0	1064	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

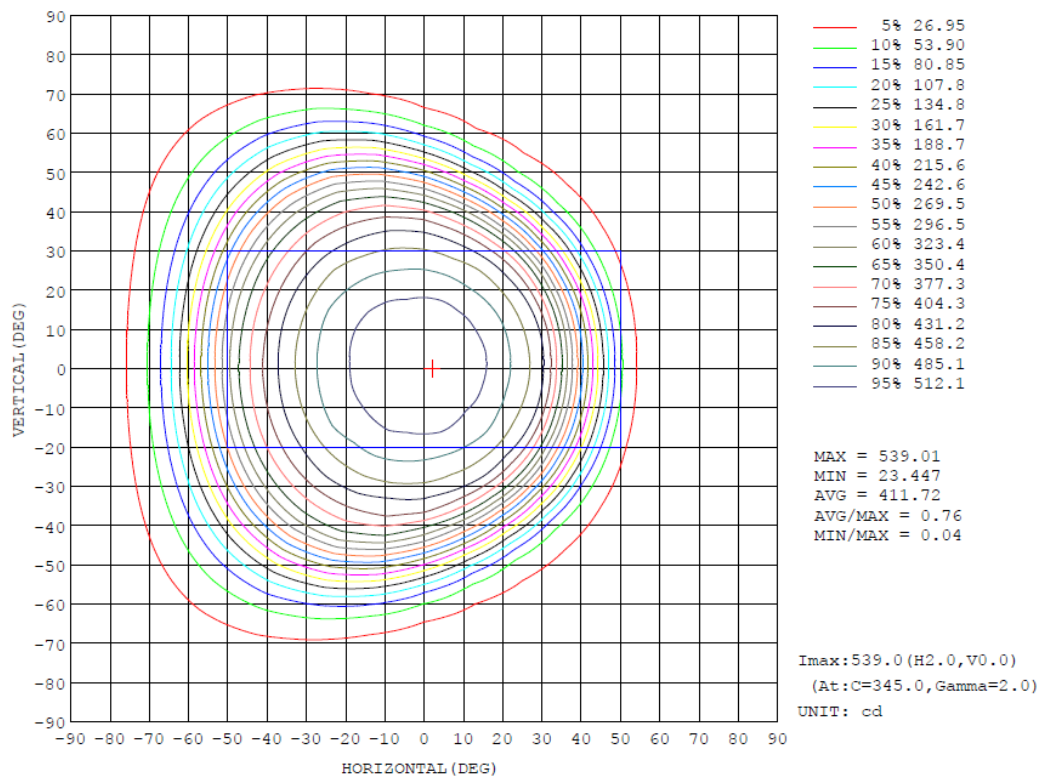
	Zonal (lm)		Total (lm)	Percent
0-10	50.98	0-10	50.98	4.79%
10-20	146.47	0-20	197.45	18.56%
20-30	222.00	0-30	419.45	39.43%
30-40	253.67	0-40	673.12	63.27%
40-50	207.87	0-50	880.99	82.81%
50-60	119.29	0-60	1000.28	94.02%
60-70	47.80	0-70	1048.08	98.51%
70-80	13.26	0-80	1061.34	99.76%
80-90	2.56	0-90	1063.90	100.00%
90-100	0.00	0-100	1063.90	100.00%
100-110	0.00	0-110	1063.90	100.00%
110-120	0.00	0-120	1063.90	100.00%
120-130	0.00	0-130	1063.90	100.00%
130-140	0.00	0-140	1063.90	100.00%
140-150	0.00	0-150	1063.90	100.00%
150-160	0.00	0-160	1063.90	100.00%
160-170	0.00	0-170	1063.90	100.00%
170-180	0.00	0-180	1063.90	100.00%

4.2 Goniophotometer Test

Area Flux Diagram

VERTICAL (DEG)	AREA FLUX DIAGRAM																UNIT: lm			Φ t	Φ a
	90	0.00	0.02	0.04	0.06	0.08	0.08	0.08	0.06	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	
	80	0.01	0.04	0.10	0.19	0.31	0.41	0.46	0.41	0.30	0.19	0.10	0.03	0.01	0.00	0.00	0.00	0.00	2.56	0.00	
	70	0.01	0.07	0.20	0.48	0.90	1.41	1.81	1.83	1.44	0.91	0.48	0.23	0.07	0.01	0.00	0.00	0.00	9.85	4.7	
	60	0.01	0.10	0.36	0.97	2.07	3.52	4.82	5.37	4.87	3.51	1.90	0.85	0.36	0.09	0.00	0.00	0.00	28.8	26.1	
	50	0.02	0.14	0.58	1.70	3.76	6.32	8.47	9.67	9.74	8.42	5.82	2.87	1.02	0.33	0.05	0.00	0.00	58.9	57.2	
	40	0.02	0.18	0.83	2.57	5.51	8.52	10.9	12.4	13.0	12.5	10.5	6.84	2.87	0.74	0.16	0.00	0.00	87.5	86.3	
	30	0.02	0.22	1.08	3.39	6.80	9.89	12.3	14.0	14.7	14.5	13.2	10.4	5.56	1.57	0.29	0.02	0.00	108	107	
	20	0.02	0.25	1.28	3.98	7.58	10.7	13.2	14.9	15.7	15.6	14.5	12.2	7.68	2.60	0.41	0.04	0.00	121	120	
	10	0.02	0.27	1.39	4.27	7.93	11.0	13.6	15.3	16.2	16.1	15.0	12.8	8.67	3.20	0.48	0.05	0.00	126	126	
	0	0.02	0.27	1.37	4.23	7.91	11.0	13.5	15.3	16.2	16.1	15.0	12.8	8.54	3.13	0.47	0.05	0.00	126	125	
	-10	0.02	0.25	1.24	3.87	7.49	10.6	13.1	14.8	15.6	15.5	14.4	12.0	7.34	2.42	0.38	0.04	0.00	119	118	
	-20	0.02	0.21	1.02	3.21	6.61	9.73	12.1	13.7	14.5	14.3	13.0	9.89	5.09	1.39	0.27	0.02	0.00	105	104	
	-30	0.02	0.17	0.77	2.37	5.20	8.27	10.6	12.1	12.7	12.0	9.79	6.09	2.45	0.65	0.15	0.00	0.00	83.4	82.1	
	-40	0.02	0.13	0.53	1.52	3.38	5.83	7.94	9.09	8.95	7.46	4.95	2.36	0.87	0.31	0.04	0.00	0.00	53.4	51.5	
	-50	0.01	0.10	0.33	0.85	1.75	2.95	4.04	4.47	3.97	2.79	1.51	0.73	0.33	0.08	0.00	0.00	0.00	23.9	20.9	
	-60	0.01	0.07	0.19	0.41	0.74	1.10	1.34	1.33	1.06	0.70	0.42	0.21	0.06	0.01	0.00	0.00	0.00	7.65	2.13	
	-70	0.01	0.04	0.10	0.18	0.26	0.32	0.34	0.30	0.23	0.15	0.08	0.03	0.01	0.00	0.00	0.00	0.00	2.03	0.00	
	-80	0.00	0.02	0.04	0.06	0.07	0.07	0.06	0.05	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	
-90	0.00	0.02	0.04	0.06	0.07	0.07	0.06	0.05	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00		
		-90	-80	-70	-60	-50	-40	-30	-20	HORIZONTAL (DEG)			20	30	40	50	60	70	80	90	
Φ t	0.29	2.56	11.4	34.3	68.4	102	129	145	149	141	121	90.4	50.9	16.5	2.71	0.22	0.00	0.00	1064	---	
Φ a	0.00	0.02	8.61	32.0	66.2	99.7	127	143	147	139	118	88.0	48.5	13.7	0.04	0.00	0.00	0.00	---	1031	

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	2.14	3.15	3.95	4.61	5.19	5.71	6.08	6.27	6.35	6.34	6.06	5.58	5.14	4.60	3.86	3.32	2.72	2.06
-70	0.00	3.22	4.94	6.64	8.42	10.4	12.6	15.0	17.5	20.0	22.1	23.4	24.0	23.7	22.4	20.1	17.9	15.3	12.2
-60	0.00	4.08	6.66	9.70	13.5	18.6	25.4	33.5	42.3	52.4	63.6	72.4	80.0	85.8	87.0	84.2	77.5	66.9	53.3
-50	0.00	4.85	8.45	13.4	20.7	31.2	45.3	64.4	86.9	114	144	173	198	219	230	233	228	211	188
-40	0.00	5.52	10.3	17.8	29.6	47.1	73.4	107	151	199	248	291	324	349	367	374	379	372	358
-30	0.00	6.08	12.0	22.2	39.1	65.8	105	157	219	279	329	367	396	418	434	445	451	454	452
-20	0.00	6.51	13.4	26.2	47.9	83.5	135	202	272	332	378	411	438	460	477	489	497	498	499
-10	0.00	6.79	14.4	29.1	54.5	96.5	158	232	305	362	404	437	464	487	502	513	523	528	528
0	0.00	6.89	14.8	30.3	57.3	102	167	244	317	372	412	446	473	494	509	524	534	537	538
10	0.00	6.79	14.5	29.5	55.5	98.6	161	237	309	364	405	440	467	490	506	518	527	530	531
20	0.00	6.52	13.6	26.9	49.7	86.9	142	211	281	339	382	416	444	468	484	495	502	504	506
30	0.00	6.09	12.1	23.0	41.2	70.0	113	168	232	291	338	374	404	425	441	453	459	462	460
40	0.00	5.53	10.4	18.8	31.6	51.3	79.9	119	166	217	265	305	336	359	377	386	393	389	382
50	0.00	4.87	8.55	13.9	22.5	34.2	50.6	72.6	99.8	131	165	197	224	247	258	262	258	244	224
60	0.00	4.10	6.71	9.98	14.3	20.8	28.5	38.4	49.8	63.4	78.3	91.0	103	112	113	111	103	89.4	71.9
70	0.00	3.26	4.98	6.74	8.65	10.9	13.8	17.1	21.0	24.4	27.7	30.2	32.4	32.7	31.1	28.2	24.8	20.5	15.5
80	0.00	2.19	3.22	4.04	4.71	5.32	5.89	6.35	6.75	7.09	7.20	7.11	6.87	6.41	5.79	4.95	4.28	3.51	2.67
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)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
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	1.58	1.09	0.62	0.41	0.23	0.08	0.05	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.00
-70	10.3	8.20	6.03	4.15	2.43	1.15	0.55	0.18	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.00
-60	43.5	33.1	24.9	19.7	14.6	9.97	5.72	2.15	0.66	0.12	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.00
-50	159	125	92.8	62.9	40.1	29.5	21.6	14.2	7.70	2.51	0.30	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
-40	334	299	253	198	144	90.9	51.7	31.0	20.5	11.3	4.21	0.55	0.01	0.01	0.01	0.01	0.01	0.01	0.00
-30	445	432	405	362	299	223	147	78.7	37.6	21.9	11.2	3.27	0.19	0.01	0.01	0.01	0.01	0.01	0.00
-20	495	486	470	450	413	343	254	163	81.1	32.5	17.9	7.23	0.92	0.01	0.01	0.01	0.01	0.01	0.00
-10	524	515	504	482	456	415	325	226	127	50.1	22.5	10.2	1.92	0.01	0.01	0.01	0.01	0.01	0.00
0	536	526	514	497	468	436	352	250	147	61.2	24.1	11.2	2.32	0.01	0.01	0.01	0.01	0.01	0.00
10	527	518	507	488	460	423	336	235	134	53.4	23.2	10.4	1.98	0.01	0.01	0.01	0.01	0.01	0.00
20	502	492	476	455	424	360	272	177	90.7	36.1	18.7	7.51	0.99	0.01	0.01	0.01	0.01	0.01	0.00
30	452	440	418	382	323	247	167	93.0	43.6	23.4	12.0	3.58	0.22	0.01	0.01	0.01	0.01	0.02	0.00
40	360	330	286	230	171	111	62.7	35.2	22.1	12.2	4.62	0.64	0.01	0.01	0.01	0.01	0.02	0.02	0.00
50	192	154	116	79.9	50.2	33.8	23.4	15.3	8.26	2.87	0.38	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.00
60	57.3	41.7	29.2	22.2	15.8	10.8	6.27	2.51	0.79	0.17	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.00
70	12.8	9.84	7.02	4.91	2.92	1.42	0.69	0.23	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.00
80	2.05	1.41	0.79	0.53	0.29	0.11	0.07	0.04	0.02	0.02	0.02	0.03	0.03	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 @9W4000K	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	0.079	9.4	0.990	14.53

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*****