

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: 2024-12-20

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		1192
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	100.2
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		11.9
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	14.26
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	3045±175	3085
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥70		82.5
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	N/A		6
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		0.100
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		11.9
(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	2024-12-18	BULLET12 @12W3000K	ES 1st ES #3-1	241216012-S1
2	Goniophotometer Test	2024-12-18	BULLET12 @12W3000K	ES 1st ES #3-1	241216012-S1
3	THD and PF Test	2024-12-18	BULLET12 @12W3000K	ES 1st ES #3-1	241216012-S1

Remark (If any):

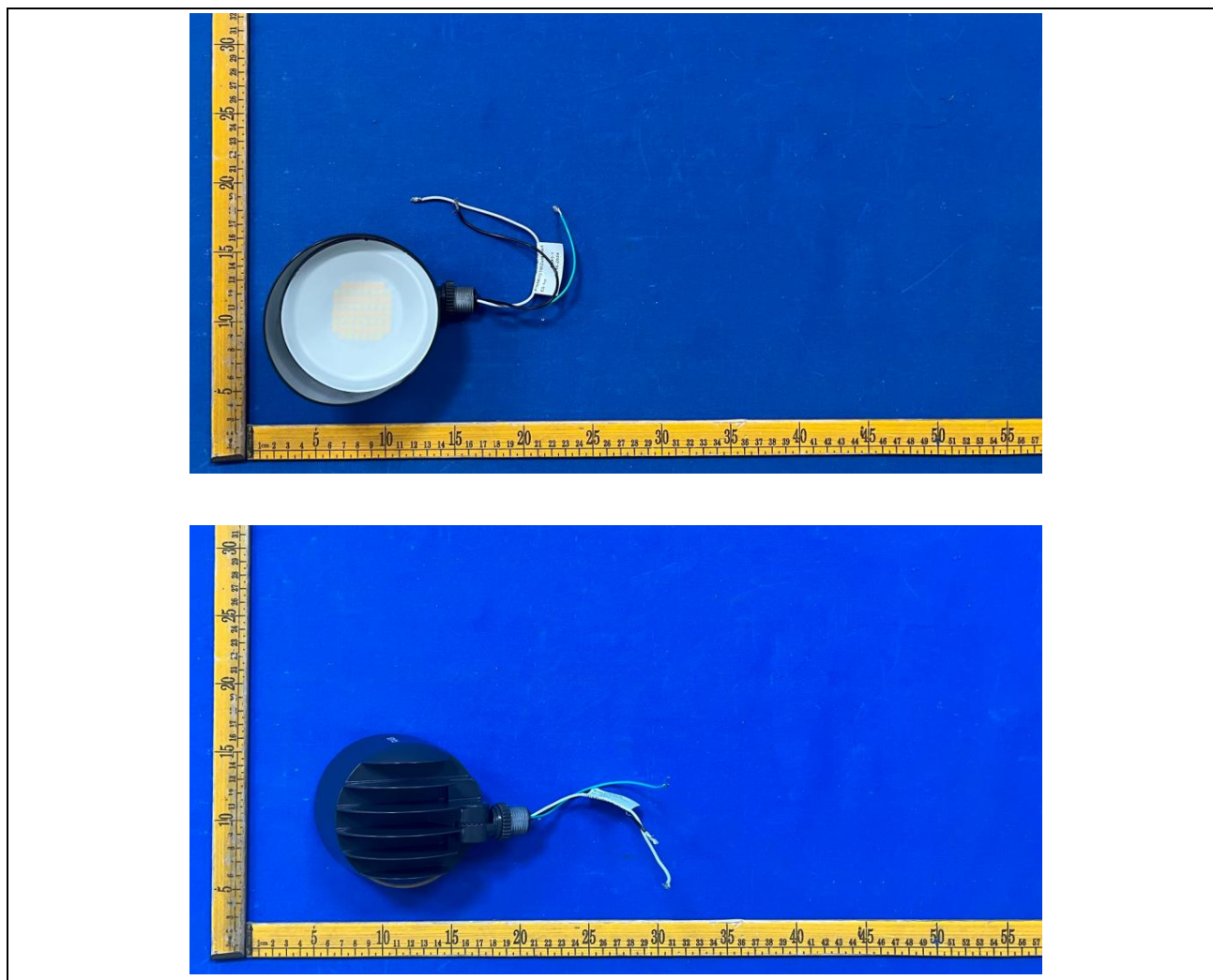
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3. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

3.0 Product Description

Luminaire Description: Model No. BULLET12 @12W3000K, 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 @12W3000K	Sample ID	241216012-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

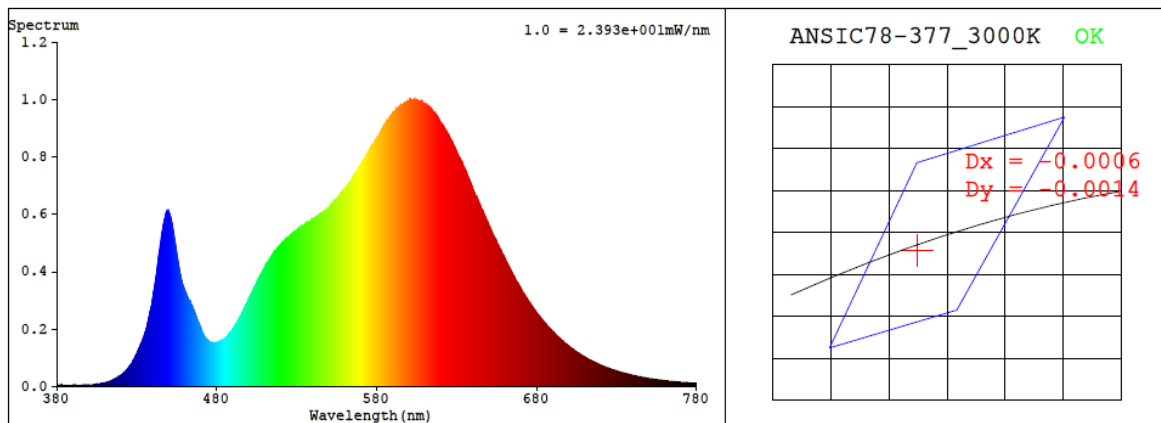
Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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	0.100	11.9	0.990

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
3085	82.5	6	-0.0005	84	98	-11%

4.1 Integrating Sphere Test



4.1 Integrating Sphere Test

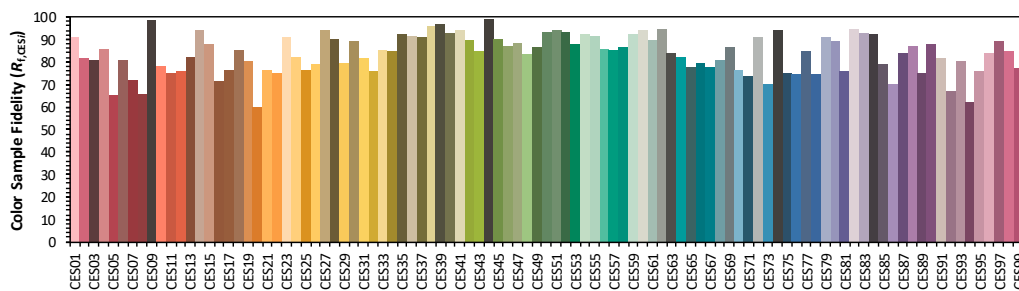
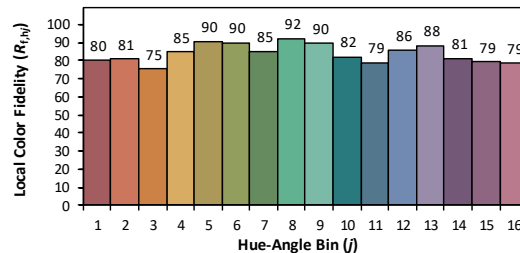
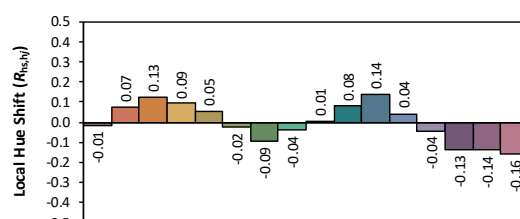
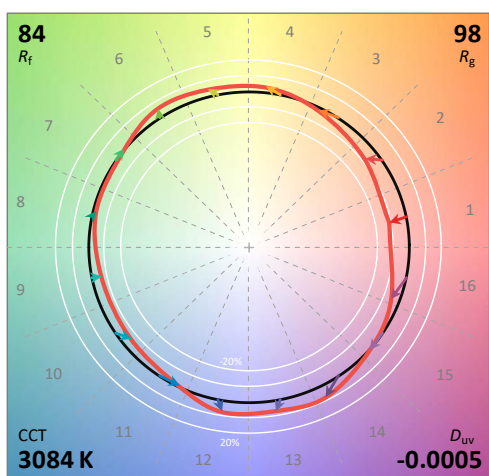
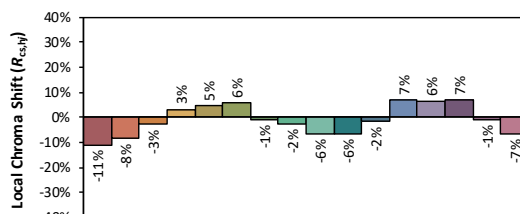
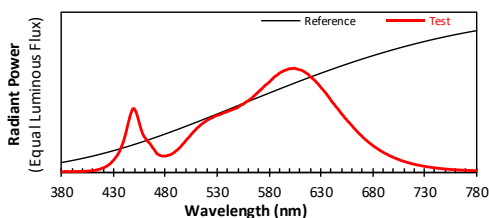
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/12/20

Model: BULLET12 @12W3000K



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

x 0.4304
 y 0.4005
 u' 0.2479
 v' 0.5190

CIE 13.3-1995
(CRI)
 R_a 82
 R_g 6

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	4.10E-06	447	5.72E-04	514	4.52E-04	581	8.72E-04	648	5.89E-04	715	8.75E-05
381	1.80E-06	448	5.98E-04	515	4.59E-04	582	8.83E-04	649	5.74E-04	716	8.48E-05
382	9.00E-07	449	6.11E-04	516	4.68E-04	583	8.93E-04	650	5.63E-04	717	8.15E-05
383	4.60E-06	450	6.06E-04	517	4.74E-04	584	9.01E-04	651	5.51E-04	718	7.89E-05
384	1.90E-06	451	5.91E-04	518	4.83E-04	585	9.14E-04	652	5.39E-04	719	7.69E-05
385	3.30E-06	452	5.68E-04	519	4.88E-04	586	9.21E-04	653	5.24E-04	720	7.40E-05
386	1.40E-06	453	5.36E-04	520	4.95E-04	587	9.26E-04	654	5.14E-04	721	7.21E-05
387	2.70E-06	454	5.00E-04	521	5.02E-04	588	9.35E-04	655	5.04E-04	722	6.95E-05
388	8.00E-07	455	4.63E-04	522	5.06E-04	589	9.41E-04	656	4.90E-04	723	6.72E-05
389	2.70E-06	456	4.27E-04	523	5.13E-04	590	9.51E-04	657	4.80E-04	724	6.52E-05
390	4.40E-06	457	3.96E-04	524	5.17E-04	591	9.57E-04	658	4.70E-04	725	6.37E-05
391	3.50E-06	458	3.69E-04	525	5.21E-04	592	9.64E-04	659	4.58E-04	726	6.13E-05
392	3.70E-06	459	3.48E-04	526	5.26E-04	593	9.66E-04	660	4.48E-04	727	5.92E-05
393	2.10E-06	460	3.32E-04	527	5.32E-04	594	9.73E-04	661	4.35E-04	728	5.72E-05
394	2.60E-06	461	3.21E-04	528	5.37E-04	595	9.79E-04	662	4.24E-04	729	5.54E-05
395	3.80E-06	462	3.06E-04	529	5.40E-04	596	9.80E-04	663	4.14E-04	730	5.38E-05
396	3.70E-06	463	2.93E-04	530	5.45E-04	597	9.84E-04	664	4.03E-04	731	5.18E-05
397	3.60E-06	464	2.83E-04	531	5.48E-04	598	9.86E-04	665	3.92E-04	732	5.03E-05
398	4.40E-06	465	2.73E-04	532	5.50E-04	599	9.93E-04	666	3.82E-04	733	4.84E-05
399	5.20E-06	466	2.59E-04	533	5.55E-04	600	9.94E-04	667	3.70E-04	734	4.72E-05
400	4.60E-06	467	2.44E-04	534	5.59E-04	601	9.95E-04	668	3.61E-04	735	4.60E-05
401	5.30E-06	468	2.28E-04	535	5.62E-04	602	9.96E-04	669	3.52E-04	736	4.45E-05
402	6.00E-06	469	2.17E-04	536	5.68E-04	603	9.96E-04	670	3.42E-04	737	4.28E-05
403	6.70E-06	470	2.02E-04	537	5.73E-04	604	9.99E-04	671	3.31E-04	738	4.14E-05
404	6.30E-06	471	1.87E-04	538	5.74E-04	605	9.98E-04	672	3.23E-04	739	3.99E-05
405	7.90E-06	472	1.75E-04	539	5.77E-04	606	9.95E-04	673	3.13E-04	740	3.86E-05
406	7.60E-06	473	1.68E-04	540	5.82E-04	607	9.92E-04	674	3.06E-04	741	3.72E-05
407	8.60E-06	474	1.62E-04	541	5.86E-04	608	9.89E-04	675	2.96E-04	742	3.67E-05
408	1.04E-05	475	1.58E-04	542	5.91E-04	609	9.86E-04	676	2.88E-04	743	3.46E-05
409	1.11E-05	476	1.54E-04	543	5.94E-04	610	9.83E-04	677	2.80E-04	744	3.40E-05
410	1.25E-05	477	1.53E-04	544	5.97E-04	611	9.82E-04	678	2.72E-04	745	3.29E-05
411	1.36E-05	478	1.52E-04	545	6.01E-04	612	9.77E-04	679	2.64E-04	746	3.15E-05
412	1.55E-05	479	1.53E-04	546	6.07E-04	613	9.72E-04	680	2.56E-04	747	3.09E-05
413	1.75E-05	480	1.52E-04	547	6.09E-04	614	9.66E-04	681	2.50E-04	748	3.00E-05
414	1.93E-05	481	1.54E-04	548	6.12E-04	615	9.59E-04	682	2.43E-04	749	2.90E-05
415	2.21E-05	482	1.58E-04	549	6.17E-04	616	9.52E-04	683	2.35E-04	750	2.80E-05
416	2.40E-05	483	1.60E-04	550	6.22E-04	617	9.46E-04	684	2.29E-04	751	2.70E-05
417	2.79E-05	484	1.62E-04	551	6.28E-04	618	9.40E-04	685	2.22E-04	752	2.64E-05
418	3.15E-05	485	1.68E-04	552	6.35E-04	619	9.28E-04	686	2.16E-04	753	2.52E-05
419	3.50E-05	486	1.71E-04	553	6.45E-04	620	9.17E-04	687	2.08E-04	754	2.45E-05
420	3.88E-05	487	1.77E-04	554	6.48E-04	621	9.09E-04	688	2.03E-04	755	2.39E-05
421	4.24E-05	488	1.83E-04	555	6.52E-04	622	9.01E-04	689	1.98E-04	756	2.28E-05
422	4.76E-05	489	1.92E-04	556	6.60E-04	623	8.92E-04	690	1.90E-04	757	2.27E-05
423	5.31E-05	490	1.99E-04	557	6.67E-04	624	8.85E-04	691	1.85E-04	758	2.17E-05
424	5.92E-05	491	2.08E-04	558	6.74E-04	625	8.74E-04	692	1.79E-04	759	2.10E-05
425	6.57E-05	492	2.15E-04	559	6.80E-04	626	8.63E-04	693	1.74E-04	760	2.03E-05
426	7.35E-05	493	2.26E-04	560	6.86E-04	627	8.53E-04	694	1.70E-04	761	1.96E-05
427	8.13E-05	494	2.34E-04	561	6.94E-04	628	8.41E-04	695	1.64E-04	762	1.91E-05
428	9.23E-05	495	2.46E-04	562	7.00E-04	629	8.30E-04	696	1.59E-04	763	1.86E-05
429	1.03E-04	496	2.58E-04	563	7.10E-04	630	8.17E-04	697	1.54E-04	764	1.79E-05
430	1.13E-04	497	2.70E-04	564	7.15E-04	631	8.04E-04	698	1.50E-04	765	1.74E-05
431	1.26E-04	498	2.80E-04	565	7.27E-04	632	7.95E-04	699	1.46E-04	766	1.69E-05
432	1.40E-04	499	2.92E-04	566	7.35E-04	633	7.82E-04	700	1.40E-04	767	1.64E-05
433	1.52E-04	500	3.05E-04	567	7.45E-04	634	7.71E-04	701	1.36E-04	768	1.59E-05
434	1.67E-04	501	3.17E-04	568	7.53E-04	635	7.59E-04	702	1.32E-04	769	1.51E-05
435	1.85E-04	502	3.25E-04	569	7.64E-04	636	7.46E-04	703	1.28E-04	770	1.49E-05
436	2.03E-04	503	3.38E-04	570	7.72E-04	637	7.31E-04	704	1.24E-04	771	1.44E-05
437	2.28E-04	504	3.48E-04	571	7.82E-04	638	7.19E-04	705	1.20E-04	772	1.40E-05
438	2.53E-04	505	3.63E-04	572	7.91E-04	639	7.04E-04	706	1.17E-04	773	1.32E-05
439	2.78E-04	506	3.72E-04	573	7.98E-04	640	6.89E-04	707	1.12E-04	774	1.33E-05
440	3.11E-04	507	3.85E-04	574	8.11E-04	641	6.76E-04	708	1.08E-04	775	1.27E-05
441	3.45E-04	508	3.93E-04	575	8.20E-04	642	6.62E-04	709	1.05E-04	776	1.27E-05
442	3.83E-04	509	4.05E-04	576	8.30E-04	643	6.53E-04	710	1.02E-04	777	1.19E-05
443	4.25E-04	510	4.16E-04	577	8.40E-04	644	6.37E-04	711	9.93E-05	778	1.17E-05
444	4.68E-04	511	4.26E-04	578	8.44E-04	645	6.26E-04	712	9.56E-05	779	1.18E-05
445	5.03E-04	512	4.33E-04	579	8.56E-04	646	6.14E-04	713	9.29E-05	780	1.19E-05
446	5.44E-04	513	4.42E-04	580	8.61E-04	647	6.02E-04	714	9.00E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	BULLET12 @12W3000K	Sample ID	241216012-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	24.8	Humidity (%RH)	41.3

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

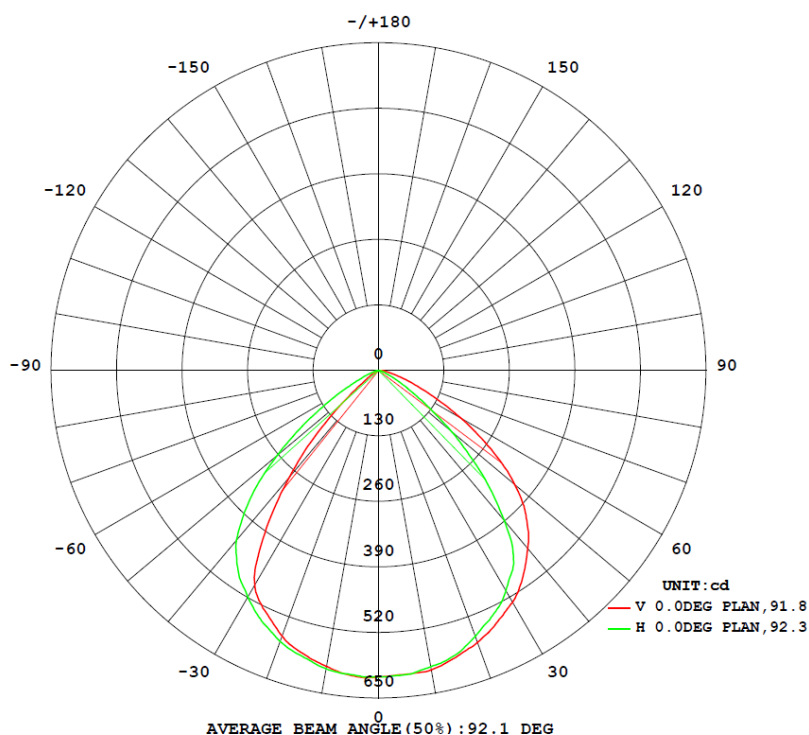
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.100	11.9	0.990
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

Test Result

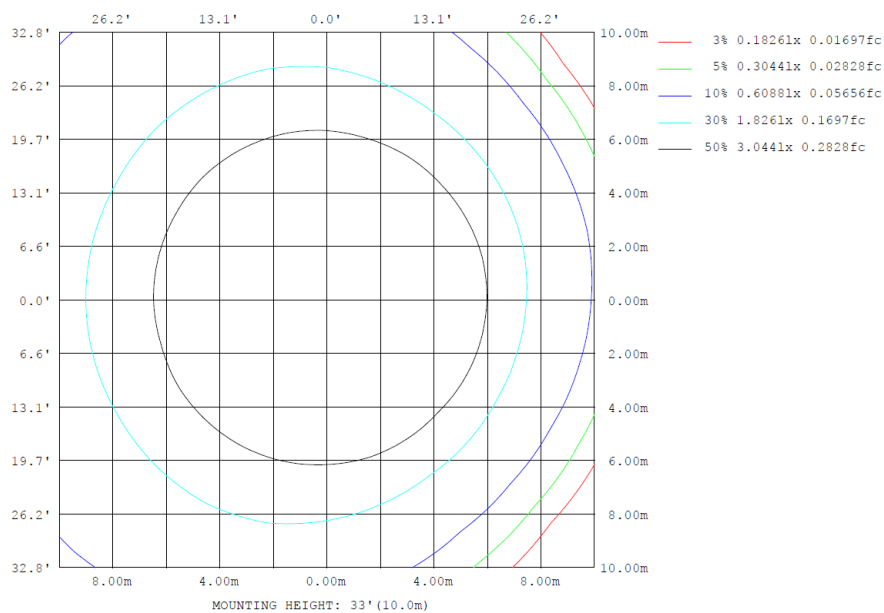
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	NEMA Type
	C0-180	C90-270	C0-180	C90-270		(0°-90°)	
1192	123.4	123.2	91.7	90.8	100.2	100.0%	6H x 6V

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	Φ zone	Φ total	Φ lum, lamp
10	595.8	592.9	596.7	598.5	603.3	601.2	601.2	595.0	0- 10	57.64	57.64	4.84,4.84
20	561.1	562.8	561.3	571.4	574.2	576.9	571.9	568.2	10- 20	165.3	223.0	18.7,18.7
30	492.4	484.4	505.2	522.5	531.8	535.5	519.4	499.1	20- 30	250.1	473.0	39.7,39.7
40	275.8	263.9	387.4	453.1	461.0	465.9	439.0	333.3	30- 40	284.3	757.3	63.5,63.5
50	66.03	64.84	189.9	334.4	353.6	361.2	264.8	95.97	40- 50	230.9	988.2	82.9,82.9
60	12.08	16.93	52.14	157.2	187.6	201.6	89.41	19.79	50- 60	132.4	1121	94,94
70	0.0108	0.6126	12.59	47.81	64.29	67.98	18.90	0.8562	60- 70	53.39	1174	98.5,98.5
80	0.0112	0.0128	2.177	10.66	17.12	14.62	3.080	0.0194	70- 80	14.89	1189	99.8,99.8
90	0	0	0	0	0	0	0	0	80- 90	2.879	1192	100,100
100	0	0	0	0	0	0	0	0	90-100	0	1192	100,100
110	0	0	0	0	0	0	0	0	100-110	0	1192	100,100
120	0	0	0	0	0	0	0	0	110-120	0	1192	100,100
130	0	0	0	0	0	0	0	0	120-130	0	1192	100,100
140	0	0	0	0	0	0	0	0	130-140	0	1192	100,100
150	0	0	0	0	0	0	0	0	140-150	0	1192	100,100
160	0	0	0	0	0	0	0	0	150-160	0	1192	100,100
170	0	0	0	0	0	0	0	0	160-170	0	1192	100,100
180	0	0	0	0	0	0	0	0	170-180	0	1192	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

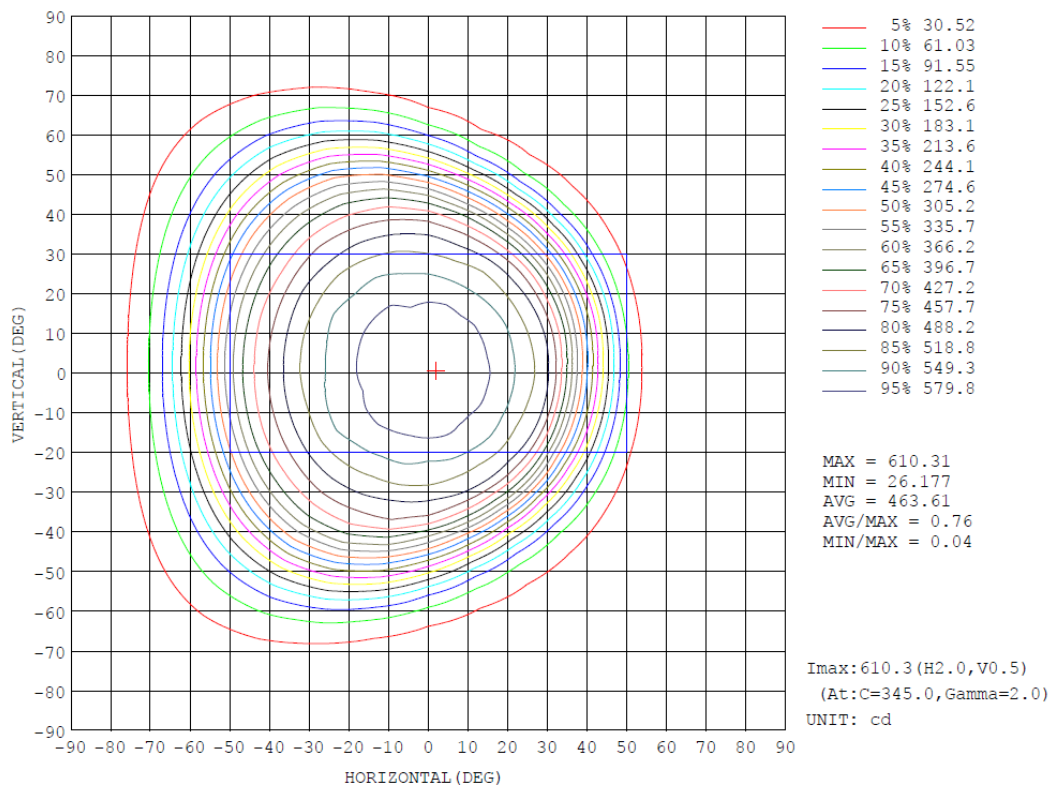
Zonal (lm)		Total (lm) Percent	
0-10	57.64	0-10	57.64 4.84%
10-20	165.32	0-20	222.96 18.71%
20-30	250.08	0-30	473.04 39.69%
30-40	284.27	0-40	757.31 63.54%
40-50	230.89	0-50	988.20 82.92%
50-60	132.45	0-60	1120.65 94.03%
60-70	53.39	0-70	1174.04 98.51%
70-80	14.89	0-80	1188.93 99.76%
80-90	2.88	0-90	1191.81 100.00%
90-100	0.00	0-100	1191.81 100.00%
100-110	0.00	0-110	1191.81 100.00%
110-120	0.00	0-120	1191.81 100.00%
120-130	0.00	0-130	1191.81 100.00%
130-140	0.00	0-140	1191.81 100.00%
140-150	0.00	0-150	1191.81 100.00%
150-160	0.00	0-160	1191.81 100.00%
160-170	0.00	0-170	1191.81 100.00%
170-180	0.00	0-180	1191.81 100.00%

4.2 Goniophotometer Test

Area Flux Diagram

		AREA FLUX DIAGRAM																UNIT:lm		Φ t	Φ a
VERTICAL (DEG)	90	0.00	0.02	0.05	0.07	0.09	0.10	0.09	0.07	0.05	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.00
	80	0.01	0.05	0.12	0.23	0.37	0.50	0.57	0.51	0.37	0.22	0.11	0.04	0.01	0.00	0.00	0.00	0.00	0.00	3.09	0.00
	70	0.01	0.08	0.24	0.56	1.07	1.69	2.19	2.24	1.77	1.10	0.56	0.26	0.08	0.01	0.00	0.00	0.00	0.00	11.9	6.30
	60	0.02	0.12	0.42	1.13	2.43	4.13	5.66	6.33	5.82	4.27	2.32	1.00	0.41	0.10	0.00	0.00	0.00	0.00	34.2	31.3
	50	0.02	0.16	0.66	1.97	4.35	7.23	9.65	11.1	11.3	9.88	7.01	3.52	1.20	0.38	0.05	0.00	0.00	0.00	68.4	66.5
	40	0.02	0.21	0.95	2.95	6.27	9.58	12.2	14.0	14.7	14.2	12.1	8.11	3.46	0.85	0.18	0.01	0.00	0.00	99.8	98.5
	30	0.03	0.25	1.23	3.85	7.65	11.1	13.9	15.8	16.6	16.4	15.0	11.9	6.57	1.83	0.32	0.02	0.00	0.00	122	121
	20	0.03	0.29	1.45	4.49	8.49	12.0	14.9	16.8	17.7	17.7	16.4	13.8	8.82	3.00	0.45	0.04	0.00	0.00	136	135
	10	0.03	0.30	1.56	4.78	8.87	12.4	15.2	17.3	18.3	18.2	17.0	14.5	9.78	3.57	0.53	0.05	0.00	0.00	142	141
	0	0.03	0.30	1.53	4.71	8.82	12.3	15.2	17.2	18.3	18.2	16.9	14.4	9.49	3.38	0.51	0.05	0.00	0.00	141	140
	-10	0.03	0.28	1.37	4.27	8.32	11.8	14.7	16.6	17.6	17.5	16.2	13.5	7.93	2.53	0.41	0.04	0.00	0.00	133	132
	-20	0.02	0.24	1.12	3.51	7.29	10.8	13.5	15.3	16.2	16.0	14.5	10.8	5.23	1.43	0.29	0.02	0.00	0.00	116	115
	-30	0.02	0.19	0.84	2.57	5.65	9.11	11.8	13.5	14.1	13.3	10.5	6.20	2.45	0.68	0.16	0.00	0.00	0.00	91.0	89.4
	-40	0.02	0.15	0.57	1.63	3.61	6.24	8.53	9.71	9.44	7.68	4.92	2.33	0.89	0.32	0.04	0.00	0.00	0.00	56.1	53.8
	-50	0.02	0.11	0.35	0.90	1.84	3.07	4.16	4.53	3.96	2.74	1.51	0.76	0.35	0.08	0.00	0.00	0.00	0.00	24.4	20.7
	-60	0.01	0.07	0.20	0.44	0.77	1.12	1.35	1.31	1.05	0.72	0.44	0.22	0.06	0.01	0.00	0.00	0.00	0.00	7.76	1.52
	-70	0.01	0.05	0.11	0.18	0.27	0.33	0.34	0.30	0.23	0.16	0.08	0.03	0.01	0.00	0.00	0.00	0.00	0.00	2.09	0.00
	-80	0.00	0.02	0.04	0.06	0.07	0.07	0.07	0.05	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	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	0.00
		-90	-80	-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	
Φ t		0.33	2.88	12.8	38.3	76.2	114	144	163	168	158	136	101	56.7	18.2	2.96	0.24	0.00	0.00	1192	---
Φ a		0.00	0.00	9.60	35.7	73.8	111	142	160	165	156	133	98.8	54.0	14.9	0.00	0.00	0.00	0.00	---	1154

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	2.42	3.47	4.28	4.97	5.56	6.07	6.42	6.55	6.54	6.46	6.14	5.64	5.21	4.69	3.97	3.43	2.83	2.18
-70	0.00	3.63	5.45	7.34	9.14	11.1	13.5	15.9	18.3	20.8	22.7	23.7	23.9	23.5	22.2	19.9	17.9	15.5	12.6
-60	0.00	4.58	7.43	10.6	14.7	20.0	27.1	35.6	44.6	54.9	66.4	74.4	81.7	86.4	86.8	82.4	75.6	65.4	52.1
-50	0.00	5.45	9.40	14.8	22.4	33.6	48.6	69.3	92.3	120	151	182	208	230	240	242	234	216	190
-40	0.00	6.20	11.4	19.5	32.2	51.0	79.0	116	162	214	268	317	355	383	404	411	417	406	387
-30	0.00	6.85	13.4	24.5	42.9	72.2	114	171	238	305	363	407	441	466	482	496	504	507	505
-20	0.00	7.34	15.2	29.1	53.0	91.7	149	222	300	368	420	458	491	516	536	548	559	560	561
-10	0.00	7.66	16.5	32.5	60.7	107	175	257	338	403	450	488	519	549	565	580	589	595	597
0	0.00	7.79	17.1	34.1	64.3	115	188	272	354	415	461	500	532	553	574	590	603	605	608
10	0.00	7.69	16.7	33.3	62.7	111	182	266	346	408	453	492	527	550	569	583	594	599	601
20	0.00	7.39	15.5	30.5	56.4	98.7	161	239	317	379	427	467	499	527	544	559	570	569	572
30	0.00	6.92	13.8	26.2	47.0	80.1	129	193	264	329	379	418	454	477	497	512	520	522	519
40	0.00	6.30	11.8	21.3	36.3	59.0	92.0	137	192	249	302	346	379	405	426	438	447	444	439
50	0.00	5.55	9.74	16.2	25.7	39.6	58.7	84.3	116	153	193	229	259	286	299	305	302	287	265
60	0.00	4.69	7.67	11.4	16.9	23.8	33.3	45.0	58.6	74.8	92.7	108	122	132	135	134	125	109	89.4
70	0.00	3.75	5.72	7.74	10.00	12.7	16.5	20.4	24.5	29.0	33.3	36.7	39.6	40.0	38.3	35.1	30.8	25.3	18.9
80	0.00	2.53	3.74	4.68	5.47	6.20	6.91	7.47	7.99	8.47	8.66	8.62	8.44	7.85	7.04	5.96	5.10	4.14	3.08
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

UNIT: cd																		
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
-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	1.67	1.16	0.66	0.44	0.24	0.09	0.05	0.03	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.00
-70	10.7	8.55	6.35	4.39	2.58	1.23	0.59	0.19	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.00
-60	43.3	33.8	25.9	20.7	15.4	10.6	6.08	2.28	0.69	0.13	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.00
-50	159	122	90.5	62.5	41.2	30.8	22.6	15.0	8.06	2.64	0.31	0.01	0.01	0.01	0.01	0.01	0.02	0.00
-40	357	313	258	195	141	89.3	51.9	32.6	21.7	12.0	4.43	0.57	0.01	0.01	0.01	0.01	0.02	0.00
-30	499	483	447	394	316	224	147	80.5	39.7	23.3	12.0	3.45	0.19	0.01	0.01	0.01	0.02	0.00
-20	558	548	529	506	461	372	266	167	84.0	34.9	19.1	7.81	0.97	0.01	0.01	0.01	0.02	0.00
-10	592	582	570	544	514	466	355	243	134	54.4	24.3	10.9	2.03	0.01	0.01	0.01	0.02	0.00
0	608	596	581	561	529	492	394	276	160	66.0	26.2	12.1	2.47	0.01	0.01	0.01	0.02	0.00
10	594	587	574	551	520	478	384	268	152	60.0	25.3	11.4	2.16	0.01	0.01	0.01	0.02	0.00
20	567	556	537	515	481	413	317	209	105	40.2	20.9	8.36	1.11	0.01	0.01	0.01	0.02	0.00
30	511	498	477	439	376	294	202	111	50.1	26.2	13.4	4.04	0.25	0.01	0.01	0.02	0.02	0.00
40	416	384	335	276	209	135	75.3	40.5	25.0	13.7	5.23	0.75	0.01	0.01	0.02	0.02	0.02	0.00
50	231	189	143	98.0	60.3	39.3	26.7	17.5	9.39	3.28	0.44	0.02	0.01	0.02	0.02	0.02	0.02	0.00
60	70.5	50.3	34.3	25.7	18.3	12.3	7.11	2.85	0.90	0.20	0.03	0.01	0.02	0.02	0.02	0.02	0.02	0.00
70	15.3	11.5	7.99	5.56	3.30	1.60	0.78	0.27	0.04	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.00
80	2.36	1.62	0.90	0.60	0.33	0.12	0.08	0.04	0.02	0.02	0.03	0.02	0.03	0.03	0.04	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
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
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
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
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
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
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
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
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
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

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	BULLET12 @12W3000K	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	0.100	11.9	0.990	14.26

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*****