

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		1030
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	110.8
		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	14.90
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	5029±283	5139
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥70		82.3
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79-2019 CIE13.3-1995	N/A		9
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		82
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%		-12%
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 @9W5000K	ES 1st ES #3-1	241216012-S1
2	Goniophotometer Test	2024-12-24	BULLET12 @9W5000K	ES 1st ES #3-1	241216012-S1
3	THD and PF Test	2024-12-24	BULLET12 @9W5000K	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 @9W5000K, 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 @9W5000K	Sample ID	241216012-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

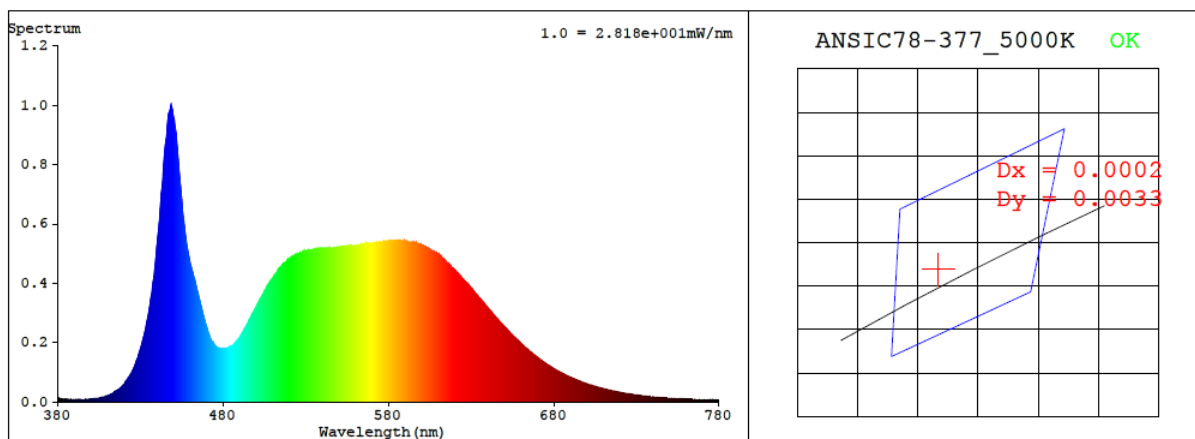
Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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
5139	82.3	9	0.0016	82	98	-12%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3416$ $y = 0.3518$ / $u' = 0.2089$ $v' = 0.4843$ ($duv=1.56e-03$)

CCT= 5139K Prcp WL: $L_d=568.8nm$ Purity=8.1%

Peak WL: $L_p=449nm$ FWHM: $=19.6nm$ Ratio:R=15.6% G=80.3% B=4.1%

Render Index: $R_a = 82.3$ AvgR = 75.4 TM30:Rf=83 Rg=97

EEL: 0.12127 A+

R1 =82	R2 =86	R3 =88	R4 =84	R5 =83	R6 =81	R7 =86
R8 =69	R9 =9	R10=66	R11=84	R12=61	R13=82	R14=93
						R15=76

4.1 Integrating Sphere Test

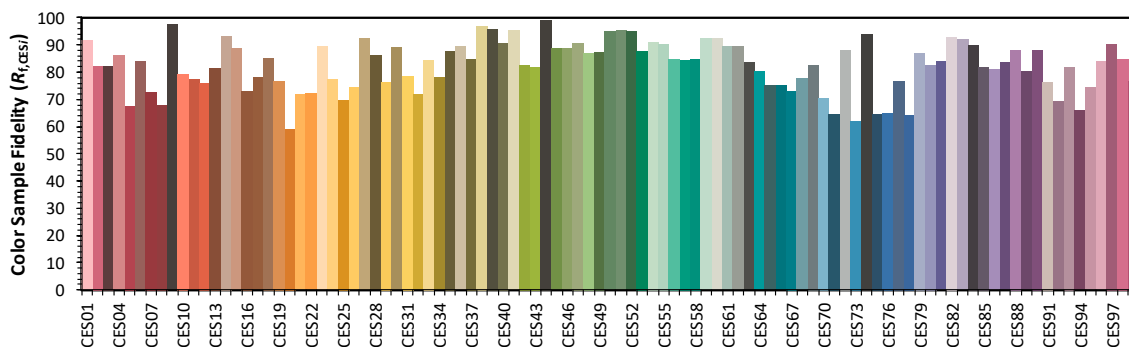
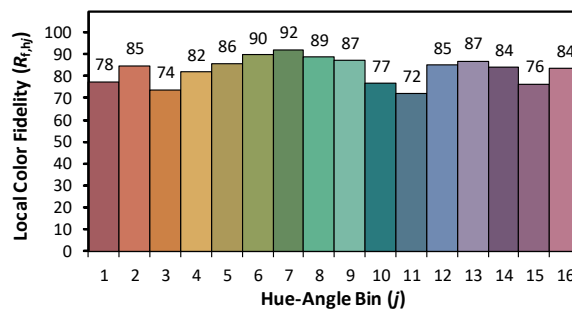
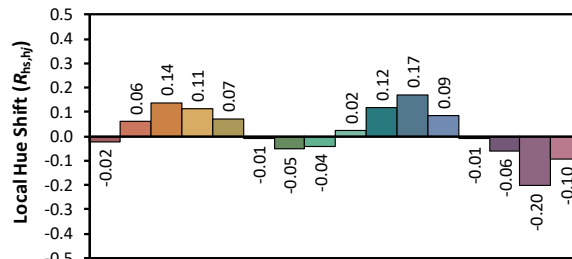
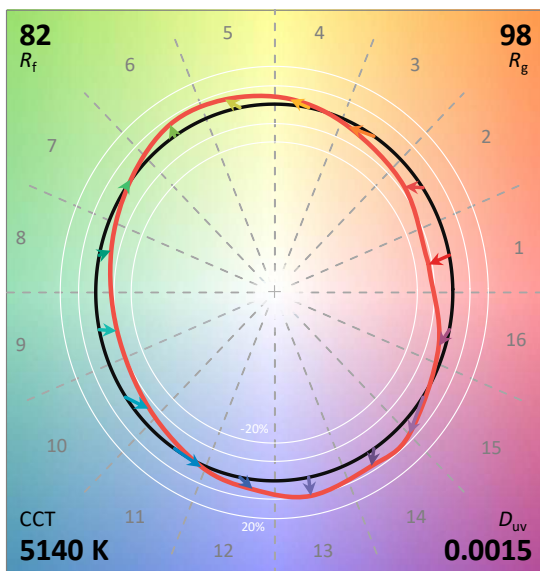
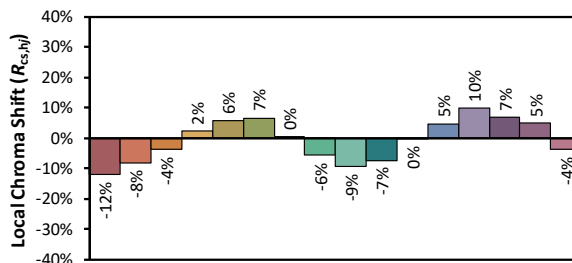
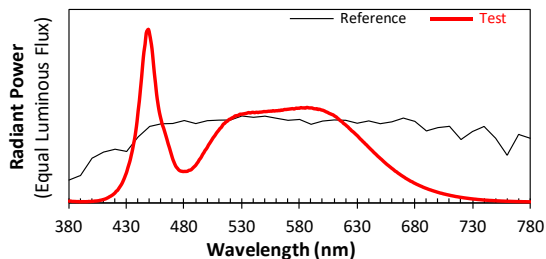
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/12/25

Model: BULLET12 @9W5000K



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

x 0.3415
 y 0.3517
 u' 0.2090
 v' 0.4842

CIE 13.3-1995
(CRI)

R_a 82
 R_g 9

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	1.06E-05	447	9.69E-04	514	4.51E-04	581	5.44E-04	648	2.66E-04	715	3.77E-05
381	1.14E-05	448	9.85E-04	515	4.54E-04	582	5.43E-04	649	2.61E-04	716	3.66E-05
382	1.06E-05	449	9.90E-04	516	4.62E-04	583	5.42E-04	650	2.54E-04	717	3.57E-05
383	9.00E-06	450	9.61E-04	517	4.66E-04	584	5.43E-04	651	2.49E-04	718	3.45E-05
384	9.30E-06	451	9.24E-04	518	4.71E-04	585	5.41E-04	652	2.43E-04	719	3.33E-05
385	8.70E-06	452	8.80E-04	519	4.77E-04	586	5.45E-04	653	2.36E-04	720	3.23E-05
386	8.70E-06	453	8.12E-04	520	4.79E-04	587	5.45E-04	654	2.31E-04	721	3.13E-05
387	7.70E-06	454	7.43E-04	521	4.84E-04	588	5.43E-04	655	2.25E-04	722	3.03E-05
388	8.60E-06	455	6.84E-04	522	4.87E-04	589	5.43E-04	656	2.19E-04	723	2.93E-05
389	7.20E-06	456	6.21E-04	523	4.91E-04	590	5.43E-04	657	2.14E-04	724	2.84E-05
390	7.30E-06	457	5.73E-04	524	4.97E-04	591	5.42E-04	658	2.09E-04	725	2.76E-05
391	7.80E-06	458	5.32E-04	525	4.98E-04	592	5.39E-04	659	2.03E-04	726	2.68E-05
392	7.60E-06	459	5.00E-04	526	4.99E-04	593	5.38E-04	660	1.98E-04	727	2.58E-05
393	7.90E-06	460	4.73E-04	527	5.00E-04	594	5.37E-04	661	1.93E-04	728	2.50E-05
394	7.40E-06	461	4.47E-04	528	5.06E-04	595	5.38E-04	662	1.87E-04	729	2.42E-05
395	8.00E-06	462	4.29E-04	529	5.07E-04	596	5.33E-04	663	1.82E-04	730	2.35E-05
396	7.70E-06	463	4.07E-04	530	5.07E-04	597	5.35E-04	664	1.78E-04	731	2.27E-05
397	9.00E-06	464	3.85E-04	531	5.08E-04	598	5.33E-04	665	1.73E-04	732	2.21E-05
398	8.70E-06	465	3.62E-04	532	5.09E-04	599	5.31E-04	666	1.68E-04	733	2.15E-05
399	8.90E-06	466	3.38E-04	533	5.11E-04	600	5.30E-04	667	1.64E-04	734	2.06E-05
400	9.90E-06	467	3.18E-04	534	5.12E-04	601	5.27E-04	668	1.59E-04	735	2.00E-05
401	9.70E-06	468	2.95E-04	535	5.14E-04	602	5.24E-04	669	1.55E-04	736	1.94E-05
402	1.11E-05	469	2.73E-04	536	5.16E-04	603	5.20E-04	670	1.50E-04	737	1.88E-05
403	1.15E-05	470	2.51E-04	537	5.14E-04	604	5.18E-04	671	1.46E-04	738	1.83E-05
404	1.19E-05	471	2.34E-04	538	5.16E-04	605	5.14E-04	672	1.41E-04	739	1.76E-05
405	1.27E-05	472	2.19E-04	539	5.17E-04	606	5.11E-04	673	1.38E-04	740	1.71E-05
406	1.37E-05	473	2.06E-04	540	5.17E-04	607	5.08E-04	674	1.34E-04	741	1.66E-05
407	1.56E-05	474	1.99E-04	541	5.15E-04	608	5.05E-04	675	1.30E-04	742	1.61E-05
408	1.66E-05	475	1.90E-04	542	5.17E-04	609	5.03E-04	676	1.26E-04	743	1.58E-05
409	1.85E-05	476	1.85E-04	543	5.18E-04	610	4.98E-04	677	1.23E-04	744	1.52E-05
410	2.02E-05	477	1.82E-04	544	5.16E-04	611	4.94E-04	678	1.20E-04	745	1.47E-05
411	2.23E-05	478	1.81E-04	545	5.18E-04	612	4.90E-04	679	1.15E-04	746	1.46E-05
412	2.45E-05	479	1.80E-04	546	5.19E-04	613	4.83E-04	680	1.12E-04	747	1.42E-05
413	2.79E-05	480	1.80E-04	547	5.19E-04	614	4.78E-04	681	1.09E-04	748	1.38E-05
414	3.10E-05	481	1.80E-04	548	5.20E-04	615	4.72E-04	682	1.06E-04	749	1.33E-05
415	3.54E-05	482	1.81E-04	549	5.22E-04	616	4.67E-04	683	1.03E-04	750	1.31E-05
416	3.87E-05	483	1.82E-04	550	5.22E-04	617	4.63E-04	684	9.96E-05	751	1.26E-05
417	4.27E-05	484	1.87E-04	551	5.22E-04	618	4.55E-04	685	9.68E-05	752	1.22E-05
418	4.71E-05	485	1.88E-04	552	5.22E-04	619	4.50E-04	686	9.41E-05	753	1.21E-05
419	5.26E-05	486	1.91E-04	553	5.24E-04	620	4.45E-04	687	9.08E-05	754	1.17E-05
420	5.85E-05	487	1.97E-04	554	5.24E-04	621	4.39E-04	688	8.81E-05	755	1.14E-05
421	6.72E-05	488	2.03E-04	555	5.24E-04	622	4.34E-04	689	8.55E-05	756	1.11E-05
422	7.17E-05	489	2.10E-04	556	5.24E-04	623	4.26E-04	690	8.32E-05	757	1.10E-05
423	8.12E-05	490	2.16E-04	557	5.27E-04	624	4.21E-04	691	8.06E-05	758	1.05E-05
424	9.11E-05	491	2.26E-04	558	5.25E-04	625	4.13E-04	692	7.80E-05	759	1.03E-05
425	1.01E-04	492	2.35E-04	559	5.26E-04	626	4.08E-04	693	7.58E-05	760	1.02E-05
426	1.12E-04	493	2.47E-04	560	5.27E-04	627	4.03E-04	694	7.38E-05	761	9.90E-06
427	1.26E-04	494	2.55E-04	561	5.27E-04	628	3.97E-04	695	7.13E-05	762	9.70E-06
428	1.42E-04	495	2.65E-04	562	5.29E-04	629	3.90E-04	696	6.93E-05	763	9.70E-06
429	1.59E-04	496	2.78E-04	563	5.27E-04	630	3.85E-04	697	6.71E-05	764	9.30E-06
430	1.76E-04	497	2.88E-04	564	5.31E-04	631	3.78E-04	698	6.52E-05	765	9.20E-06
431	2.00E-04	498	3.00E-04	565	5.29E-04	632	3.70E-04	699	6.30E-05	766	8.90E-06
432	2.21E-04	499	3.08E-04	566	5.32E-04	633	3.63E-04	700	6.10E-05	767	8.70E-06
433	2.43E-04	500	3.18E-04	567	5.34E-04	634	3.58E-04	701	5.91E-05	768	8.50E-06
434	2.73E-04	501	3.31E-04	568	5.33E-04	635	3.50E-04	702	5.69E-05	769	8.40E-06
435	3.01E-04	502	3.41E-04	569	5.34E-04	636	3.45E-04	703	5.58E-05	770	8.30E-06
436	3.36E-04	503	3.51E-04	570	5.35E-04	637	3.37E-04	704	5.39E-05	771	8.00E-06
437	3.70E-04	504	3.61E-04	571	5.36E-04	638	3.32E-04	705	5.20E-05	772	8.00E-06
438	4.13E-04	505	3.72E-04	572	5.37E-04	639	3.25E-04	706	5.07E-05	773	7.80E-06
439	4.64E-04	506	3.80E-04	573	5.38E-04	640	3.18E-04	707	4.90E-05	774	7.50E-06
440	5.27E-04	507	3.90E-04	574	5.39E-04	641	3.11E-04	708	4.75E-05	775	7.50E-06
441	5.81E-04	508	4.00E-04	575	5.37E-04	642	3.05E-04	709	4.61E-05	776	7.50E-06
442	6.50E-04	509	4.08E-04	576	5.38E-04	643	2.99E-04	710	4.46E-05	777	7.30E-06
443	7.19E-04	510	4.16E-04	577	5.41E-04	644	2.92E-04	711	4.30E-05	778	7.10E-06
444	7.96E-04	511	4.26E-04	578	5.40E-04	645	2.85E-04	712	4.18E-05	779	7.20E-06
445	8.62E-04	512	4.31E-04	579	5.41E-04	646	2.79E-04	713	4.05E-05	780	7.20E-06
446	9.06E-04	513	4.41E-04	580	5.41E-04	647	2.73E-04	714	3.92E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	BULLET12 @9W5000K	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

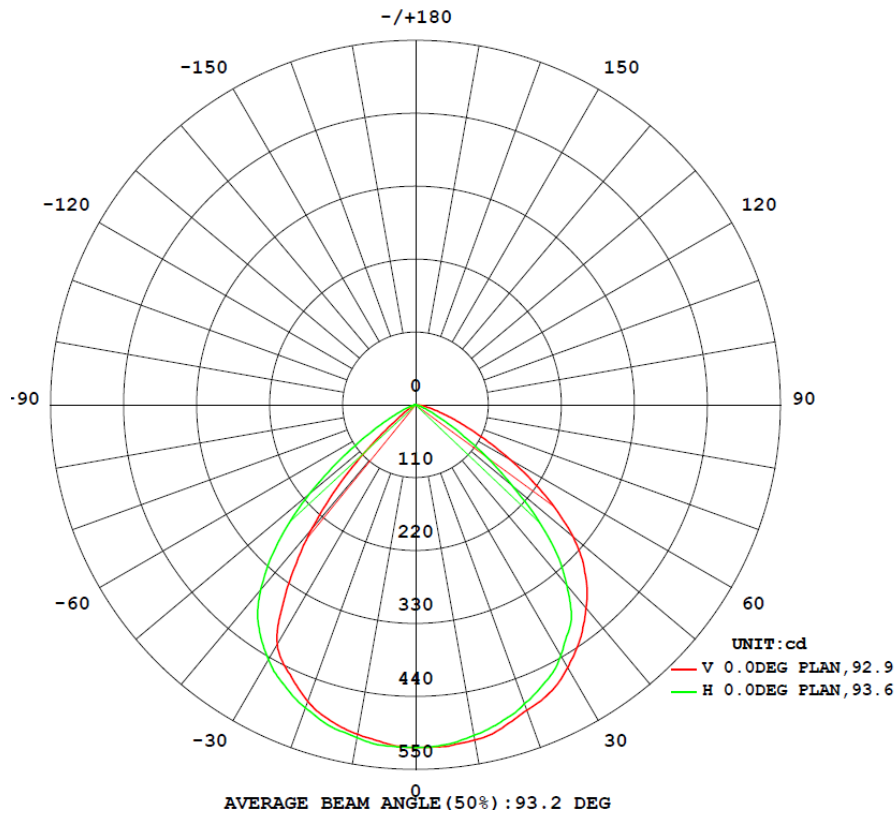
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.078	9.3	0.989
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

Test Result

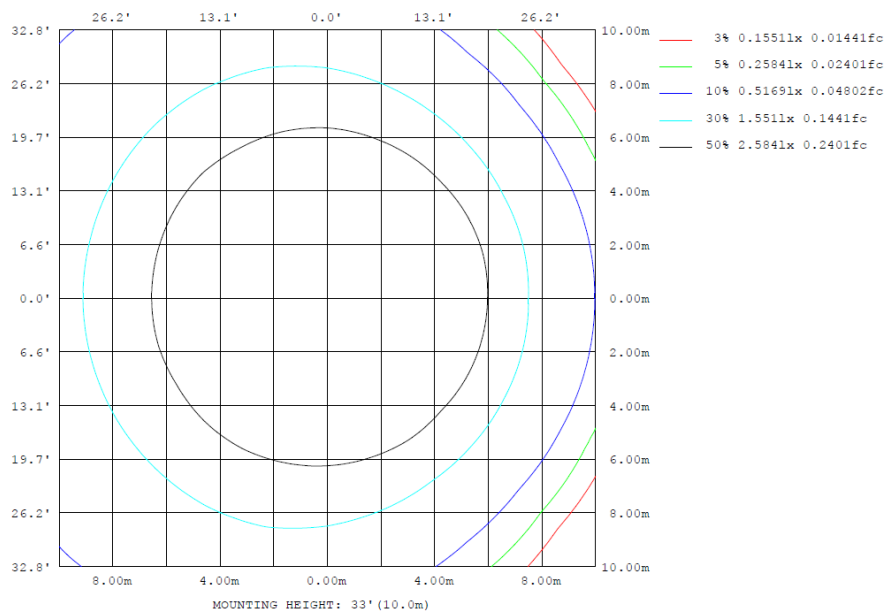
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	NEMA Type
	C0-180	C90-270	C0-180	C90-270		(0°-90°)	
1030	124.0	125.6	92.6	94.4	110.8	100.0%	6H x 6V

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	504.7	504.4	506.3	509.2	513.4	512.4	509.9	508.0	0-10	48.94	48.94	4.75, 4.75
20	476.3	477.5	479.8	486.7	490.2	494.6	486.7	482.5	10-20	140.8	189.8	18.4, 18.4
30	417.9	416.1	437.6	451.3	457.9	459.2	443.7	423.6	20-30	213.9	403.6	39.2, 39.2
40	242.8	262.1	354.4	394.6	399.8	401.1	363.2	264.2	30-40	245.4	649.0	63, 63
50	60.01	67.03	192.1	302.5	310.1	308.7	209.1	73.36	40-50	202.6	851.6	82.7, 82.7
60	11.09	16.07	55.52	151.5	163.5	164.1	65.01	16.69	50-60	116.5	968.1	94, 94
70	0.0102	0.5746	12.31	46.69	55.98	53.94	14.57	0.7306	60-70	46.61	1015	98.5, 98.5
80	0.0096	0.0099	2.051	10.49	14.41	11.44	2.571	0.0185	70-80	12.88	1028	99.8, 99.8
90	0	0	0	0	0	0	0	0	80-90	2.488	1030	100, 100
100	0	0	0	0	0	0	0	0	90-100	0	1030	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	1030	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	1030	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	1030	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	1030	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	1030	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	1030	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	1030	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	1030	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

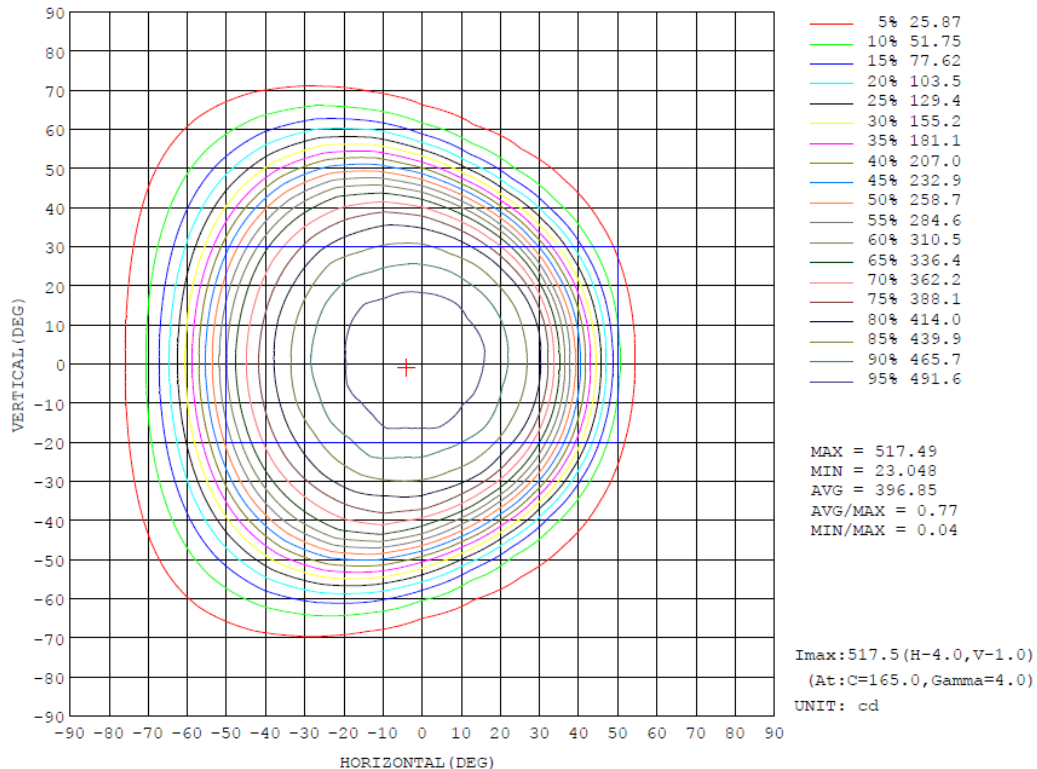
Zonal (lm)		Total (lm)		Percent
0-10	48.94	0-10	48.94	4.75%
10-20	140.82	0-20	189.76	18.42%
20-30	213.85	0-30	403.61	39.18%
30-40	245.36	0-40	648.97	63.00%
40-50	202.62	0-50	851.59	82.67%
50-60	116.55	0-60	968.14	93.98%
60-70	46.61	0-70	1014.75	98.51%
70-80	12.88	0-80	1027.63	99.76%
80-90	2.49	0-90	1030.12	100.00%
90-100	0.00	0-100	1030.12	100.00%
100-110	0.00	0-110	1030.12	100.00%
110-120	0.00	0-120	1030.12	100.00%
120-130	0.00	0-130	1030.12	100.00%
130-140	0.00	0-140	1030.12	100.00%
140-150	0.00	0-150	1030.12	100.00%
150-160	0.00	0-160	1030.12	100.00%
160-170	0.00	0-170	1030.12	100.00%
170-180	0.00	0-180	1030.12	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	0.46	0.00		
	80	0.01	0.04	0.10	0.18	0.29	0.38	0.42	0.37	0.28	0.18	0.09	0.03	0.01	0.00	0.00	0.00	0.00	0.00	2.38	0.00		
	70	0.01	0.07	0.20	0.45	0.85	1.32	1.68	1.67	1.32	0.84	0.46	0.22	0.07	0.01	0.00	0.00	0.00	0.00	9.16	4.15		
	60	0.01	0.10	0.35	0.92	1.96	3.33	4.58	5.08	4.54	3.22	1.75	0.81	0.35	0.08	0.00	0.00	0.00	0.00	27.1	24.5		
	50	0.02	0.14	0.55	1.62	3.59	6.07	8.15	9.26	9.25	7.93	5.39	2.63	0.96	0.32	0.05	0.00	0.00	0.00	55.9	54.2		
	40	0.02	0.18	0.80	2.47	5.31	8.27	10.5	12.0	12.5	12.0	9.97	6.37	2.65	0.71	0.16	0.00	0.00	0.00	83.9	82.7		
	30	0.02	0.22	1.04	3.28	6.60	9.61	12.0	13.4	14.1	14.0	12.7	9.88	5.18	1.50	0.28	0.02	0.00	0.00	104	103		
	20	0.02	0.25	1.24	3.87	7.37	10.4	12.8	14.4	15.1	15.0	13.9	11.7	7.30	2.48	0.40	0.04	0.00	0.00	116	116		
	10	0.02	0.26	1.35	4.16	7.71	10.7	13.1	14.8	15.6	15.5	14.4	12.3	8.31	3.10	0.48	0.05	0.00	0.00	122	121		
	0	0.02	0.26	1.34	4.14	7.69	10.7	13.1	14.7	15.5	15.4	14.4	12.3	8.26	3.08	0.46	0.05	0.00	0.00	121	121		
	-10	0.02	0.24	1.22	3.79	7.28	10.3	12.6	14.2	15.0	14.9	13.8	11.6	7.24	2.42	0.38	0.04	0.00	0.00	115	114		
	-20	0.02	0.21	1.01	3.16	6.47	9.48	11.8	13.3	14.0	13.7	12.6	9.70	5.19	1.40	0.27	0.02	0.00	0.00	102	101		
	-30	0.02	0.17	0.76	2.35	5.15	8.10	10.4	11.8	12.3	11.7	9.71	6.23	2.52	0.65	0.15	0.00	0.00	0.00	82.0	80.7		
	-40	0.02	0.13	0.52	1.51	3.38	5.81	7.92	9.08	9.01	7.61	5.14	2.45	0.88	0.31	0.04	0.00	0.00	0.00	53.8	52.0		
	-50	0.01	0.09	0.33	0.85	1.76	2.99	4.11	4.56	4.10	2.90	1.56	0.74	0.33	0.08	0.00	0.00	0.00	0.00	24.4	21.6		
	-60	0.01	0.07	0.19	0.41	0.75	1.12	1.39	1.39	1.10	0.72	0.42	0.21	0.06	0.01	0.00	0.00	0.00	0.00	7.84	2.52		
	-70	0.01	0.04	0.10	0.17	0.26	0.33	0.35	0.31	0.23	0.15	0.08	0.03	0.01	0.00	0.00	0.00	0.00	0.00	2.06	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	0.00	0.43	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	HORIZONTAL (DEG)	20	30	40	50	60	70	80	90					
Φ t		0.28	2.49	11.2	33.5	66.6	99.0	125	140	144	136	116	87.2	49.3	16.1	2.68	0.21	0.00	0.00	1030	---		
Φ a		0.00	0.07	8.48	31.2	64.5	97.0	123	138	142	134	114	85.0	46.9	13.4	0.08	0.00	0.00	0.00	---	998		

Isocandela



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

H (DBG)	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
V (DBG)	-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	2.09	3.07	3.87	4.54	5.13	5.65	5.98	6.24	6.39	6.37	6.12	5.71	5.25	4.68	3.90	3.34	2.72	2.05
-70	0.00	3.14	4.83	6.53	8.38	10.2	12.6	15.0	17.6	20.3	22.5	23.9	24.8	24.6	23.2	20.8	18.5	15.7	12.3
-60	0.00	3.97	6.51	9.60	13.3	18.5	25.3	33.5	42.5	52.8	64.4	74.1	82.3	88.1	89.9	87.7	81.0	69.8	55.5
-50	0.00	4.73	8.33	13.1	20.4	30.9	45.0	64.2	86.7	114	145	175	200	221	232	236	231	215	192
-40	0.00	5.38	10.0	17.4	29.2	46.6	72.7	107	150	199	246	288	319	343	359	367	372	365	354
-30	0.00	5.93	11.7	21.9	38.4	64.8	103	155	216	275	322	358	385	406	422	432	437	439	438
-20	0.00	6.34	13.1	25.6	47.0	82.0	133	198	266	324	368	400	424	444	460	472	479	480	480
-10	0.00	6.60	14.0	28.4	53.3	94.6	155	227	298	352	392	423	449	468	484	492	503	508	506
0	0.00	6.70	14.4	29.5	56.0	99.9	164	239	310	362	400	432	458	479	490	505	513	517	517
10	0.00	6.60	14.1	28.7	54.0	96.0	157	231	301	354	393	427	451	474	488	500	508	509	510
20	0.00	6.34	13.2	26.1	48.2	84.2	138	204	272	330	372	403	430	452	469	476	481	484	487
30	0.00	5.92	11.8	22.6	39.8	67.4	109	162	224	281	329	365	391	412	427	435	441	444	444
40	0.00	5.37	10.1	18.0	30.5	49.3	76.6	114	159	208	255	295	325	348	363	372	377	372	363
50	0.00	4.72	8.27	13.4	21.8	32.8	48.3	69.2	94.9	125	157	188	214	235	246	249	244	229	209
60	0.00	3.97	6.49	9.61	13.8	19.9	27.2	36.4	47.1	60.0	73.7	85.4	97.0	105	106	104	95.8	82.2	65.0
70	0.00	3.16	4.81	6.48	8.30	10.5	13.1	16.2	19.7	23.3	25.9	28.2	29.8	30.0	28.7	25.8	22.7	18.9	14.6
80	0.00	2.12	3.11	3.87	4.51	5.07	5.61	6.02	6.37	6.66	6.71	6.56	6.25	5.85	5.32	4.59	4.00	3.32	2.57
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	0.00	0.00	0.00	0.00	0.00	0.00	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	1.57	1.08	0.61	0.41	0.22	0.08	0.05	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
-70	10.4	8.23	6.02	4.12	2.40	1.13	0.54	0.17	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
-60	45.0	33.7	25.0	19.8	14.6	9.95	5.68	2.12	0.65	0.12	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
-50	164	130	96.9	64.9	40.8	29.7	21.6	14.2	7.65	2.48	0.30	0.01	0.01	0.01	0.01	0.01	0.01	0.00
-40	332	301	260	206	150	93.9	52.2	31.0	20.5	11.3	4.18	0.54	0.01	0.01	0.01	0.01	0.01	0.00
-30	430	418	395	356	299	229	152	80.9	37.1	21.8	11.2	3.24	0.18	0.01	0.01	0.01	0.01	0.00
-20	476	466	453	434	400	337	256	166	81.6	32.0	17.8	7.17	0.90	0.01	0.01	0.01	0.01	0.00
-10	504	493	483	463	439	399	319	223	127	49.1	22.3	10.1	1.89	0.01	0.01	0.01	0.01	0.00
0	512	505	494	476	449	418	338	243	144	60.0	23.9	11.1	2.29	0.01	0.01	0.01	0.01	0.00
10	507	497	487	469	442	407	321	224	128	52.5	22.9	10.3	1.95	0.01	0.01	0.01	0.01	0.00
20	484	474	459	438	408	343	255	165	86.8	35.8	18.5	7.42	0.98	0.01	0.01	0.01	0.01	0.00
30	435	423	401	364	305	229	153	87.5	42.4	23.0	11.8	3.53	0.21	0.01	0.01	0.01	0.02	0.00
40	342	312	269	213	156	102	58.8	34.1	21.6	11.9	4.53	0.64	0.01	0.01	0.01	0.02	0.02	0.00
50	178	141	106	73.1	46.8	32.3	22.6	14.8	8.08	2.82	0.37	0.01	0.01	0.01	0.02	0.02	0.02	0.00
60	52.3	38.7	27.7	21.2	15.4	10.5	6.14	2.46	0.77	0.17	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.00
70	12.1	9.42	6.81	4.77	2.85	1.39	0.68	0.23	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.00
80	1.98	1.37	0.78	0.52	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	0.00
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 @9W5000K	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	14.90

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*****