

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Address: 408 W 14th St New York, NY 10014

Prepared By

Dongguan New Testing Centre Co., Ltd.

Address: 3F No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China

Prepare by:

Alan Wang

Engineer: Alan Wang

Date: 2025-02-21

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

Issue Date: 2025-02-21

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		3763
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	97.5
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		38.6
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	15.28
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	0.9	120V	0.987
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019	7 steps	3045±175	3096
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥70		82.2
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79-2019 CIE13.3-1995	N/A		5
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		0.326
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		38.6
(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	2025-02-20	SMSBULLET2X20 @40W3000K	ES 1st ES #3-6	241216025-S1
2	Goniophotometer Test	2025-02-20	SMSBULLET2X20 @40W3000K	ES 1st ES #3-6	241216025-S1
3	THD and PF Test	2025-02-20	SMSBULLET2X20 @40W3000K	ES 1st ES #3-6	241216025-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. SMSBULLET2X20 @40W3000K, 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.	SMSBULLET2X20 @40W3000K	Sample ID	241216025-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

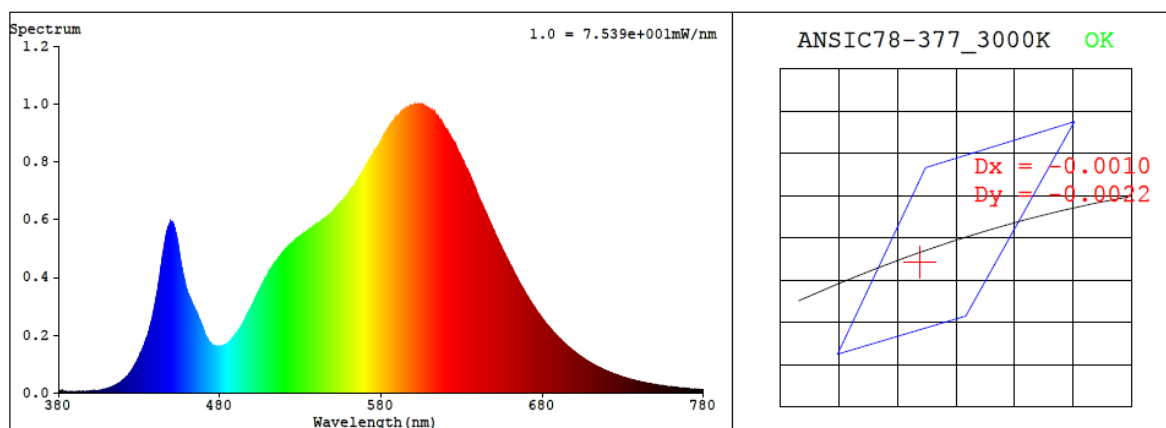
Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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	0.326	38.6	0.987

CCT (K)	CRI	R9	Duv	SDCM	Rf	Rg	IES Rcs,h1
3096	82.2	5	-0.0007	2.4	84	98	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4292$ $y = 0.3995$ / $u' = 0.2476$ $v' = 0.5184$ ($duv = -7.30e-04$)

CCT= 3096K Prcp WL: $L_d = 582.7\text{nm}$ Purity=48.7%

Peak WL: $L_p = 603\text{nm}$ FWHM: $= 134.0\text{nm}$ Ratio: R=22.3% G=75.3% B=2.4%

Render Index: $R_a = 82.2$ AvgR = 76.1 TM30: $R_f = 83$ $R_g = 97$

EEL: 0.14013 A+

R1 =81 R2 =89 R3 =96 R4 =81 R5 =81 R6 =87 R7 =83

R8 =59 R9 =5 R10=75 R11=81 R12=69 R13=83 R14=98 R15=73

4.1 Integrating Sphere Test

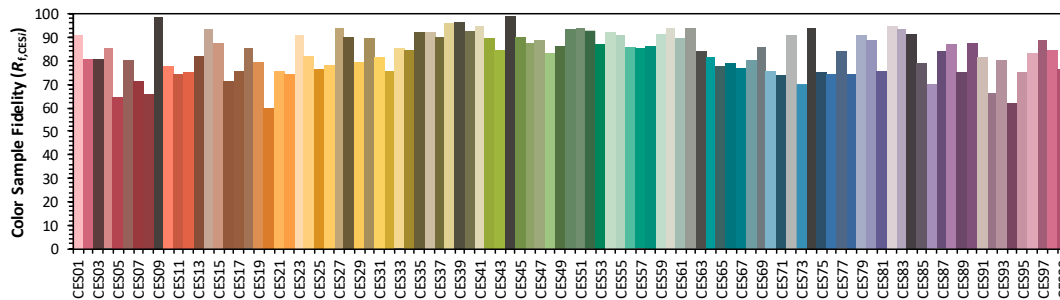
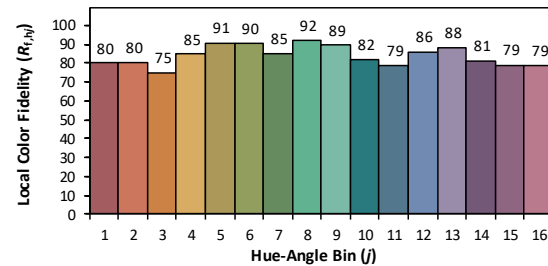
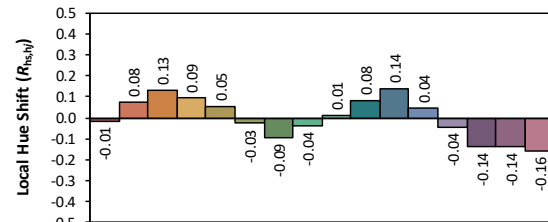
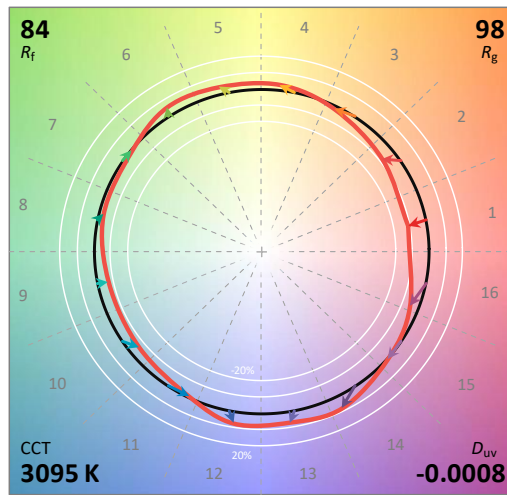
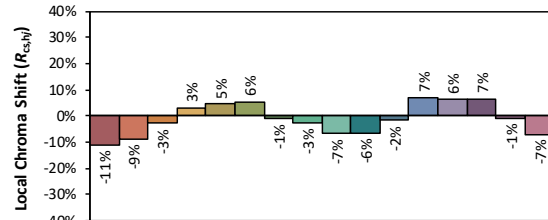
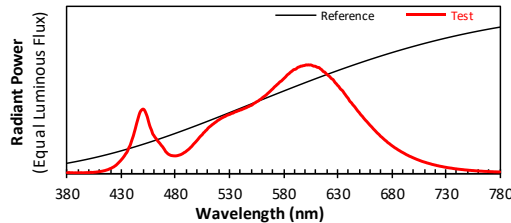
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2025/2/21

Model: SMSBULLET2X20 @40W3000K



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

x 0.4292
 y 0.3994
 u' 0.2476
 v' 0.5184

CIE 13.3-1995
(CRI)

R_a 82
 R_g 5

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	5.50E-06	447	5.56E-04	514	4.48E-04	581	8.80E-04	648	5.84E-04	715	8.93E-05
381	6.10E-06	448	5.75E-04	515	4.54E-04	582	8.89E-04	649	5.71E-04	716	8.69E-05
382	6.40E-06	449	5.85E-04	516	4.63E-04	583	9.01E-04	650	5.61E-04	717	8.34E-05
383	4.50E-06	450	5.91E-04	517	4.70E-04	584	9.11E-04	651	5.47E-04	718	8.08E-05
384	5.10E-06	451	5.86E-04	518	4.77E-04	585	9.18E-04	652	5.35E-04	719	7.87E-05
385	5.00E-06	452	5.70E-04	519	4.86E-04	586	9.27E-04	653	5.25E-04	720	7.60E-05
386	3.00E-06	453	5.46E-04	520	4.91E-04	587	9.36E-04	654	5.11E-04	721	7.42E-05
387	4.50E-06	454	5.20E-04	521	4.98E-04	588	9.43E-04	655	4.99E-04	722	7.09E-05
388	4.30E-06	455	4.83E-04	522	5.04E-04	589	9.52E-04	656	4.88E-04	723	6.93E-05
389	3.70E-06	456	4.47E-04	523	5.10E-04	590	9.57E-04	657	4.78E-04	724	6.67E-05
390	4.60E-06	457	4.18E-04	524	5.15E-04	591	9.59E-04	658	4.67E-04	725	6.47E-05
391	4.60E-06	458	3.95E-04	525	5.20E-04	592	9.65E-04	659	4.55E-04	726	6.29E-05
392	4.70E-06	459	3.64E-04	526	5.24E-04	593	9.74E-04	660	4.44E-04	727	6.11E-05
393	5.40E-06	460	3.50E-04	527	5.30E-04	594	9.79E-04	661	4.34E-04	728	5.89E-05
394	4.40E-06	461	3.34E-04	528	5.36E-04	595	9.82E-04	662	4.23E-04	729	5.69E-05
395	4.30E-06	462	3.22E-04	529	5.39E-04	596	9.88E-04	663	4.11E-04	730	5.52E-05
396	5.30E-06	463	3.07E-04	530	5.42E-04	597	9.88E-04	664	4.01E-04	731	5.36E-05
397	5.40E-06	464	2.94E-04	531	5.46E-04	598	9.92E-04	665	3.91E-04	732	5.14E-05
398	6.10E-06	465	2.83E-04	532	5.53E-04	599	9.93E-04	666	3.80E-04	733	5.03E-05
399	5.80E-06	466	2.71E-04	533	5.54E-04	600	9.96E-04	667	3.69E-04	734	4.86E-05
400	5.60E-06	467	2.57E-04	534	5.58E-04	601	9.99E-04	668	3.61E-04	735	4.77E-05
401	7.40E-06	468	2.46E-04	535	5.65E-04	602	9.98E-04	669	3.51E-04	736	4.60E-05
402	8.50E-06	469	2.32E-04	536	5.67E-04	603	1.00E-03	670	3.40E-04	737	4.41E-05
403	7.70E-06	470	2.17E-04	537	5.71E-04	604	9.98E-04	671	3.33E-04	738	4.26E-05
404	8.20E-06	471	2.00E-04	538	5.76E-04	605	9.99E-04	672	3.23E-04	739	4.11E-05
405	9.40E-06	472	1.90E-04	539	5.78E-04	606	9.97E-04	673	3.14E-04	740	4.04E-05
406	1.01E-05	473	1.80E-04	540	5.85E-04	607	9.92E-04	674	3.05E-04	741	3.86E-05
407	1.14E-05	474	1.74E-04	541	5.85E-04	608	9.88E-04	675	2.98E-04	742	3.77E-05
408	1.25E-05	475	1.68E-04	542	5.91E-04	609	9.87E-04	676	2.88E-04	743	3.64E-05
409	1.39E-05	476	1.64E-04	543	5.94E-04	610	9.84E-04	677	2.80E-04	744	3.55E-05
410	1.50E-05	477	1.63E-04	544	5.99E-04	611	9.78E-04	678	2.73E-04	745	3.43E-05
411	1.73E-05	478	1.61E-04	545	6.03E-04	612	9.76E-04	679	2.65E-04	746	3.35E-05
412	1.87E-05	479	1.61E-04	546	6.07E-04	613	9.74E-04	680	2.57E-04	747	3.20E-05
413	2.10E-05	480	1.60E-04	547	6.13E-04	614	9.64E-04	681	2.50E-04	748	3.09E-05
414	2.33E-05	481	1.61E-04	548	6.16E-04	615	9.58E-04	682	2.43E-04	749	3.02E-05
415	2.55E-05	482	1.63E-04	549	6.22E-04	616	9.47E-04	683	2.35E-04	750	2.93E-05
416	2.90E-05	483	1.66E-04	550	6.25E-04	617	9.37E-04	684	2.30E-04	751	2.85E-05
417	3.19E-05	484	1.69E-04	551	6.30E-04	618	9.34E-04	685	2.23E-04	752	2.72E-05
418	3.52E-05	485	1.72E-04	552	6.39E-04	619	9.24E-04	686	2.16E-04	753	2.68E-05
419	4.03E-05	486	1.77E-04	553	6.46E-04	620	9.13E-04	687	2.10E-04	754	2.55E-05
420	4.44E-05	487	1.83E-04	554	6.50E-04	621	9.06E-04	688	2.05E-04	755	2.51E-05
421	4.84E-05	488	1.90E-04	555	6.59E-04	622	8.97E-04	689	1.98E-04	756	2.44E-05
422	5.46E-05	489	1.95E-04	556	6.63E-04	623	8.89E-04	690	1.93E-04	757	2.34E-05
423	5.90E-05	490	2.03E-04	557	6.69E-04	624	8.76E-04	691	1.87E-04	758	2.26E-05
424	6.71E-05	491	2.11E-04	558	6.78E-04	625	8.69E-04	692	1.82E-04	759	2.20E-05
425	7.34E-05	492	2.19E-04	559	6.83E-04	626	8.62E-04	693	1.76E-04	760	2.16E-05
426	8.31E-05	493	2.28E-04	560	6.92E-04	627	8.47E-04	694	1.70E-04	761	2.09E-05
427	9.29E-05	494	2.38E-04	561	7.00E-04	628	8.34E-04	695	1.66E-04	762	1.99E-05
428	1.03E-04	495	2.47E-04	562	7.07E-04	629	8.24E-04	696	1.60E-04	763	1.96E-05
429	1.13E-04	496	2.59E-04	563	7.15E-04	630	8.11E-04	697	1.56E-04	764	1.89E-05
430	1.25E-04	497	2.71E-04	564	7.22E-04	631	8.02E-04	698	1.52E-04	765	1.81E-05
431	1.36E-04	498	2.81E-04	565	7.32E-04	632	7.87E-04	699	1.47E-04	766	1.75E-05
432	1.49E-04	499	2.92E-04	566	7.41E-04	633	7.75E-04	700	1.43E-04	767	1.72E-05
433	1.63E-04	500	3.03E-04	567	7.50E-04	634	7.67E-04	701	1.38E-04	768	1.72E-05
434	1.79E-04	501	3.15E-04	568	7.59E-04	635	7.57E-04	702	1.34E-04	769	1.62E-05
435	1.92E-04	502	3.27E-04	569	7.69E-04	636	7.41E-04	703	1.30E-04	770	1.57E-05
436	2.12E-04	503	3.39E-04	570	7.78E-04	637	7.28E-04	704	1.26E-04	771	1.51E-05
437	2.37E-04	504	3.48E-04	571	7.89E-04	638	7.13E-04	705	1.22E-04	772	1.46E-05
438	2.55E-04	505	3.58E-04	572	7.99E-04	639	7.00E-04	706	1.18E-04	773	1.45E-05
439	2.83E-04	506	3.72E-04	573	8.07E-04	640	6.89E-04	707	1.14E-04	774	1.41E-05
440	3.14E-04	507	3.80E-04	574	8.17E-04	641	6.70E-04	708	1.11E-04	775	1.32E-05
441	3.42E-04	508	3.92E-04	575	8.25E-04	642	6.58E-04	709	1.07E-04	776	1.33E-05
442	3.78E-04	509	4.00E-04	576	8.36E-04	643	6.48E-04	710	1.04E-04	777	1.30E-05
443	4.14E-04	510	4.13E-04	577	8.45E-04	644	6.34E-04	711	1.01E-04	778	1.25E-05
444	4.54E-04	511	4.23E-04	578	8.50E-04	645	6.23E-04	712	9.82E-05	779	1.25E-05
445	4.89E-04	512	4.31E-04	579	8.60E-04	646	6.12E-04	713	9.47E-05	780	1.25E-05
446	5.24E-04	513	4.39E-04	580	8.70E-04	647	5.98E-04	714	9.23E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	SMSBULLET2X20 @40W3000K	Sample ID	241216025-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

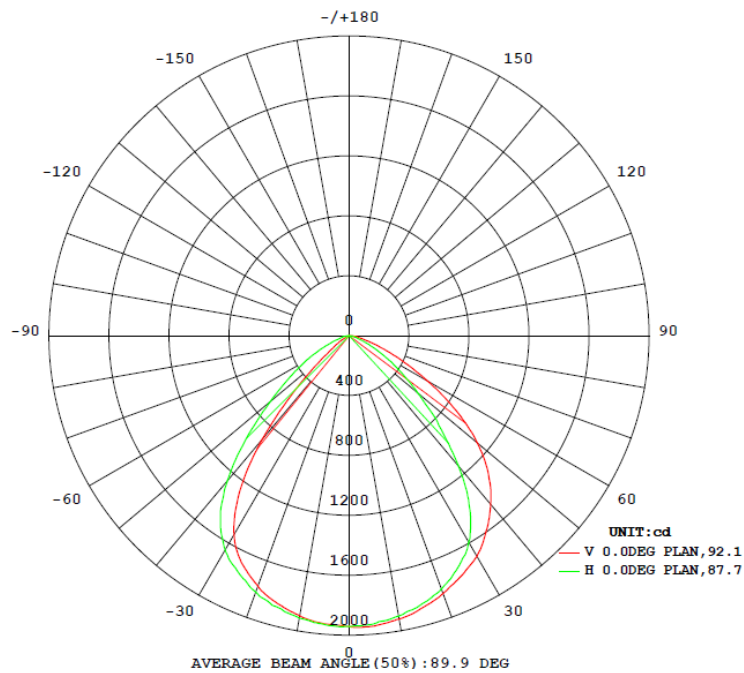
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.326	38.6	0.987
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

Test Result

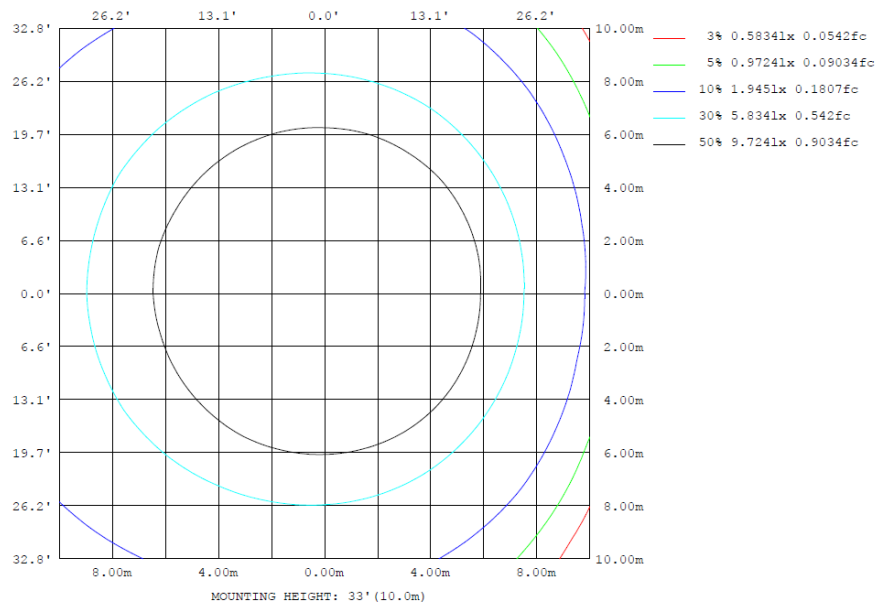
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	NEMA Type
	C0-180	C90-270	C0-180	C90-270		(0°-90°)	
3763	123.8	128.9	91.8	88.0	97.5	100.0%	6H x 6V

4.2 Goniophotometer Test

Lighting Distribution Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	zone	total	lum, lamp
10	1900	1893	1900	1913	1920	1914	1914	1907	0- 10	183.8	183.8	4.88, 4.88
20	1779	1782	1800	1809	1831	1817	1821	1793	10- 20	526.3	710.1	18.9, 18.9
30	1536	1572	1595	1644	1702	1681	1654	1612	20- 30	795.0	1505	40, 40
40	897.3	996.8	1134	1351	1468	1434	1263	1100	30- 40	897.7	2403	63.9, 63.9
50	217.2	375.9	601.5	869.6	1118	991.4	690.0	472.3	40- 50	715.7	3118	82.9, 82.9
60	52.76	94.93	271.6	378.4	602.9	448.7	325.6	135.9	50- 60	411.5	3530	93.8, 93.8
70	2.156	19.29	82.00	128.7	212.9	149.9	106.2	26.66	60- 70	173.6	3704	98.4, 98.4
80	0.0780	3.515	9.287	21.21	49.85	28.67	19.61	5.050	70- 80	51.09	3755	99.8, 99.8
90	0	0	0	0	0	0	0	0	80- 90	8.067	3763	100, 100
100	0	0	0	0	0	0	0	0	90-100	0	3763	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	3763	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	3763	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	3763	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	3763	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	3763	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	3763	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	3763	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	3763	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

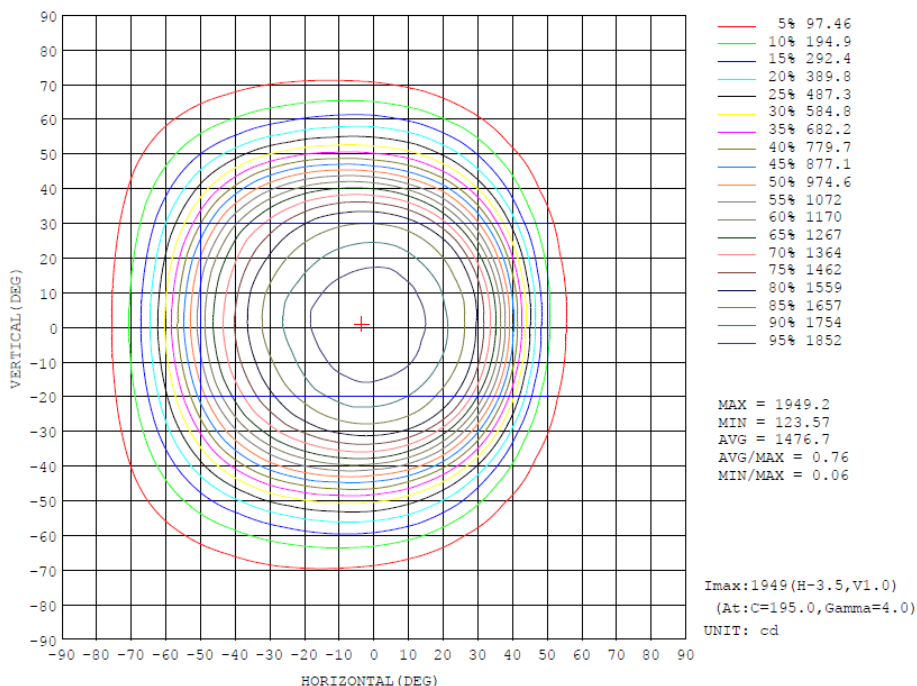
Zonal (lm)		Total (lm)		Percent
0-10	183.80	0-10	183.80	4.88%
10-20	526.29	0-20	710.09	18.87%
20-30	794.99	0-30	1505.08	40.00%
30-40	897.66	0-40	2402.74	63.86%
40-50	715.71	0-50	3118.45	82.88%
50-60	411.47	0-60	3529.92	93.81%
60-70	173.58	0-70	3703.50	98.43%
70-80	51.09	0-80	3754.59	99.79%
80-90	8.07	0-90	3762.66	100.00%
90-100	0.00	0-100	3762.66	100.00%
100-110	0.00	0-110	3762.66	100.00%
110-120	0.00	0-120	3762.66	100.00%
120-130	0.00	0-130	3762.66	100.00%
130-140	0.00	0-140	3762.66	100.00%
140-150	0.00	0-150	3762.66	100.00%
150-160	0.00	0-160	3762.66	100.00%
160-170	0.00	0-170	3762.66	100.00%
170-180	0.00	0-180	3762.66	100.00%

4.2 Goniophotometer Test

Area Flux Diagram

		AREA FLUX DIAGRAM															UNIT: lm			Φ t	Φ a	
VERTICAL (DEG)	90	0.01	0.06	0.10	0.14	0.15	0.21	0.31	0.38	0.23	0.10	0.06	0.08	0.07	0.03	0.01	0.00	0.00	0.00	1.93	0.00	
	80	0.02	0.12	0.28	0.49	0.79	1.25	1.66	1.88	1.86	1.59	1.12	0.65	0.32	0.13	0.04	0.01	0.00	0.00	12.2	0.00	
	70	0.03	0.20	0.60	1.34	2.46	3.79	5.03	5.95	6.26	5.69	4.27	2.47	1.09	0.38	0.11	0.02	0.00	0.00	39.7	16.0	
	60	0.04	0.32	1.14	2.90	5.62	8.94	12.0	14.2	15.1	14.1	11.3	7.17	3.18	0.99	0.24	0.04	0.00	0.00	97.4	88.6	
	50	0.05	0.46	1.92	5.33	11.1	18.2	24.5	28.6	30.0	28.2	23.2	15.4	7.31	2.31	0.50	0.07	0.00	0.00	197	192	
	40	0.06	0.62	2.88	8.48	17.9	28.1	36.5	42.5	45.1	44.0	38.2	27.3	14.0	4.30	0.95	0.12	0.01	0.00	311	307	
	30	0.07	0.77	3.84	11.7	23.5	34.7	43.5	49.5	52.6	52.4	48.2	38.2	22.0	7.09	1.43	0.19	0.01	0.00	390	386	
	20	0.08	0.89	4.60	14.0	26.7	38.0	47.0	53.0	56.4	56.3	52.1	44.1	28.3	9.80	1.84	0.26	0.01	0.00	434	430	
	10	0.08	0.96	5.04	15.1	28.0	39.6	48.6	55.0	58.4	58.1	54.0	46.1	31.3	11.3	2.05	0.29	0.01	0.00	454	451	
	0	0.08	0.95	4.97	14.9	27.8	39.2	48.2	54.7	58.3	57.9	53.8	45.8	30.8	10.9	1.97	0.28	0.01	0.00	450	447	
-30	-10	0.07	0.87	4.41	13.3	25.8	37.1	46.2	52.7	56.1	55.7	51.6	43.3	26.9	8.79	1.67	0.23	0.01	0.00	425	421	
	-20	0.07	0.73	3.57	10.7	21.8	33.0	42.0	48.4	51.7	51.2	46.8	36.3	19.8	5.88	1.25	0.16	0.00	0.00	373	370	
	-30	0.06	0.58	2.61	7.58	15.9	25.4	33.6	39.4	42.2	41.0	35.1	24.3	11.6	3.32	0.79	0.09	0.00	0.00	283	279	
	-40	0.05	0.43	1.71	4.65	9.54	15.6	21.1	24.9	26.4	24.8	19.9	12.6	5.52	1.73	0.39	0.05	0.00	0.00	169	163	
	-50	0.04	0.29	1.01	2.49	4.82	7.62	10.4	12.4	13.1	12.0	9.24	5.44	2.25	0.71	0.18	0.03	0.00	0.00	82.0	71.6	
	-60	0.03	0.19	0.52	1.13	2.06	3.23	4.31	5.03	5.14	4.49	3.19	1.71	0.74	0.27	0.08	0.01	0.00	0.00	32.2	8.34	
	-70	0.02	0.12	0.25	0.40	0.59	0.96	1.32	1.49	1.39	1.10	0.71	0.40	0.21	0.09	0.02	0.00	0.00	0.00	9.10	0.00	
	-80	0.01	0.05	0.10	0.12	0.13	0.15	0.20	0.24	0.14	0.05	0.03	0.04	0.04	0.02	0.00	0.00	0.00	0.00	1.32	0.00	
	-90																					
			-90	-80	-70	-60	-50	-40	-30	-20	HORIZONTAL (DEG)				20	30	40	50	60	70	80	90
Φ t	t	0.89	8.61	39.5	115	225	335	426	490	520	509	453	351	205	68.1	13.5	1.85	0.06	0.00	0.00	3762	---
Φ a	a	0.00	0.26	30.0	106	217	327	418	482	512	501	445	343	196	55.8	0.66	0.00	0.00	0.00	0.00	---	3632

Isocandela



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table-1																			UNIT: cd			
H (DEG)																						
V (DEG)	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	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	6.39	8.95	10.8	12.1	12.8	13.0	12.7	12.1	10.9	12.2	13.7	15.3	17.9	20.4	22.3	18.4	14.0	9.29			
-70	0.00	9.25	13.9	18.7	22.9	27.3	32.2	37.8	44.1	51.5	62.9	73.8	82.7	88.1	91.5	92.6	91.2	87.5	82.0			
-60	0.00	11.6	19.4	28.5	40.0	54.8	74.2	95.0	121	148	173	199	224	243	261	275	281	280	272			
-50	0.00	13.9	25.3	41.6	66.5	99.2	141	193	251	314	375	437	497	546	579	602	613	616	602			
-40	0.00	16.2	31.6	57.5	99.1	158	238	337	455	583	711	829	926	1006	1070	1115	1144	1152	1134			
-30	0.00	18.2	38.0	74.7	135	227	356	515	697	886	1052	1194	1311	1405	1477	1536	1576	1599	1595			
-20	0.00	19.8	43.8	90.1	170	295	469	684	913	1123	1294	1430	1535	1615	1689	1742	1779	1803	1800			
-10	0.00	20.8	47.9	102	199	348	558	805	1053	1263	1420	1540	1643	1719	1788	1840	1875	1903	1900			
0	0.00	21.3	49.9	108	213	375	603	869	1118	1314	1468	1593	1702	1770	1831	1881	1920	1945	1941			
10	0.00	20.9	48.4	104	204	358	575	836	1089	1288	1439	1575	1676	1745	1802	1850	1886	1910	1914			
20	0.00	19.9	44.6	93.3	179	312	501	736	982	1186	1348	1472	1574	1658	1714	1755	1793	1814	1821			
30	0.00	18.4	39.9	78.3	144	248	392	569	775	979	1156	1290	1397	1484	1555	1603	1634	1652	1654			
40	0.00	16.4	32.6	61.2	108	178	267	382	521	670	815	946	1051	1134	1203	1245	1269	1278	1263			
50	0.00	14.0	26.2	44.5	73.5	111	162	223	293	367	443	519	585	634	677	701	709	710	696			
60	0.00	11.7	20.2	30.3	44.4	62.4	85.0	112	142	172	202	232	258	280	301	316	325	329	326			
70	0.00	9.38	14.2	20.0	25.0	30.7	37.5	45.7	55.3	65.6	77.6	88.8	98.1	105	110	113	113	111	106			
80	0.00	6.47	9.22	11.3	12.6	13.5	13.5	14.7	15.0	14.8	18.1	21.5	24.6	27.1	29.2	30.6	27.2	23.6	19.6			
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			

Table--2																UNIT: °cd				
H (DBG)	V (DBG)																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90		
-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	6.87	4.41	2.23	3.03	3.70	4.16	3.30	2.52	1.79	1.14	0.63	0.28	0.17	0.12	0.10	0.10	0.09	0.00	0.00	
-70	73.2	63.1	52.0	40.6	30.0	21.4	15.6	10.8	7.13	4.34	2.63	1.31	0.81	0.48	0.19	0.08	0.09	0.10	0.00	
-60	251	224	190	148	108	74.1	48.5	29.2	18.9	11.7	6.29	3.02	1.23	0.37	0.11	0.08	0.09	0.00	0.00	
-50	570	523	460	385	303	215	138	82.9	49.1	26.2	13.6	6.41	2.38	0.61	0.18	0.08	0.09	0.00	0.00	
-40	1098	1036	936	806	648	475	308	185	105	58.2	29.3	12.2	3.85	0.98	0.27	0.10	0.09	0.00	0.00	
-30	1580	1534	1448	1305	1113	885	623	363	186	102	54.8	22.8	7.09	1.52	0.35	0.10	0.08	0.00	0.00	
-20	1790	1749	1694	1620	1500	1257	955	614	315	143	78.3	37.4	11.2	2.10	0.38	0.10	0.08	0.00	0.00	
-10	1882	1858	1810	1734	1643	1478	1191	815	439	195	96.7	48.9	15.3	2.42	0.35	0.10	0.08	0.00	0.00	
0	1930	1900	1851	1779	1684	1536	1274	897	493	217	103	52.8	16.6	2.16	0.23	0.08	0.08	0.00	0.00	
10	1901	1870	1820	1748	1661	1510	1230	856	476	217	102	51.1	16.8	2.87	0.46	0.12	0.08	0.00	0.00	
20	1812	1774	1725	1657	1549	1319	1028	688	367	171	85.3	41.4	13.5	2.85	0.56	0.15	0.09	0.00	0.00	
30	1638	1598	1528	1398	1206	988	718	447	241	124	63.3	27.9	8.74	2.34	0.55	0.15	0.09	0.00	0.00	
40	1222	1148	1051	931	766	582	397	249	139	71.9	36.7	16.0	5.63	1.59	0.46	0.14	0.10	0.00	0.00	
50	665	623	555	471	382	285	194	117	66.6	35.1	18.1	8.75	3.53	1.02	0.32	0.13	0.10	0.00	0.00	
60	306	279	244	199	153	108	70.5	41.9	26.0	16.0	8.65	4.37	1.92	0.65	0.20	0.11	0.11	0.00	0.00	
70	97.5	87.1	74.7	59.5	44.8	32.2	22.9	15.2	9.64	6.17	3.48	1.66	0.79	0.32	0.13	0.12	0.12	0.00	0.00	
80	15.4	10.9	6.65	6.59	6.73	7.12	5.51	4.06	2.78	1.82	1.03	0.45	0.29	0.19	0.15	0.14	0.11	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	
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.	SMSBULLET2X20 @40W3000K	Sample ID	241216025-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±1°C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion was calculated.</p>

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD(%)
120.0	60	0.326	38.6	0.987	15.28

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*****