

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		4189
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	105.5
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		39.7
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	14.73
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	0.9	120V	0.988
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019	7 steps	3985±275	3930
		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		16
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		0.335
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		39.7
(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 @40W4000K	ES 1st ES #3-6	241216025-S1
2	Goniophotometer Test	2025-02-20	SMSBULLET2X20 @40W4000K	ES 1st ES #3-6	241216025-S1
3	THD and PF Test	2025-02-20	SMSBULLET2X20 @40W4000K	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 @40W4000K, 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 @40W4000K	Sample ID	241216025-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

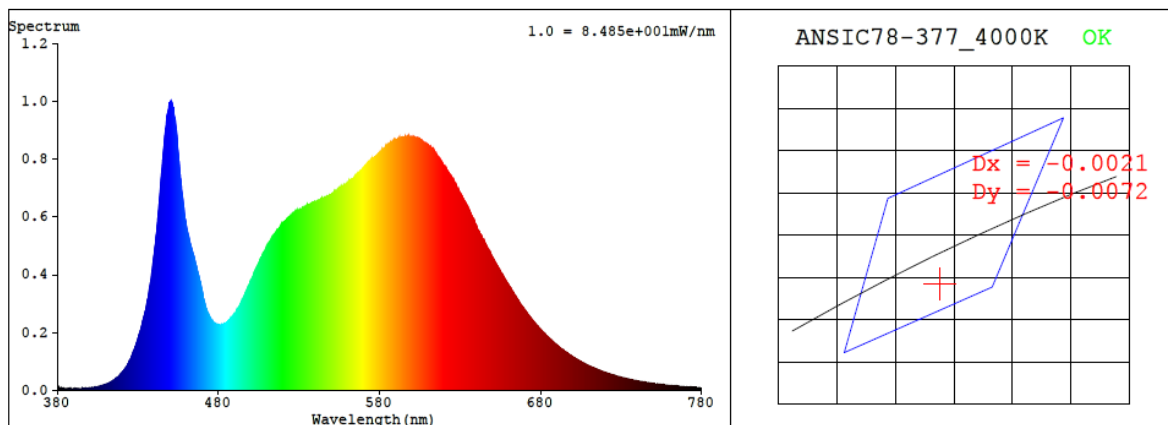
Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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	0.335	39.7	0.988

CCT (K)	CRI	R9	Duv	SDCM	Rf	Rg	IES Rcs,h1
3930	84.4	16	-0.0028	4.1	84	98	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3815$ $y = 0.3715$ / $u' = 0.2279$ $v' = 0.4994$ ($duv = -2.79e-03$)

CCT= 3930K Prcp WL: $L_d = 581.0\text{nm}$ Purity=26.0%

Peak WL: $L_p = 451\text{nm}$ FWHM: $= 22.3\text{nm}$ Ratio: R=19.0% G=77.5% B=3.4%

Render Index: $R_a = 84.4$ AvgR = 78.4 TM30: $R_f = 84$ $R_g = 98$

EEL: 0.12904 A+

R1 =84 R2 =90 R3 =94 R4 =84 R5 =84 R6 =86 R7 =86

R8 =67 R9 =16 R10=76 R11=84 R12=65 R13=86 R14=96 R15=79

4.1 Integrating Sphere Test

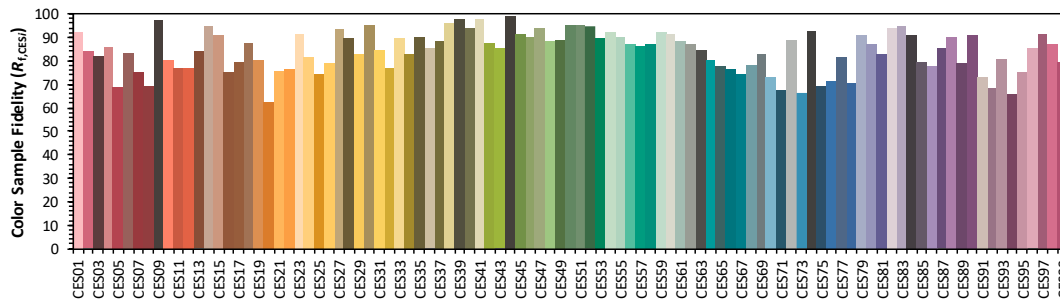
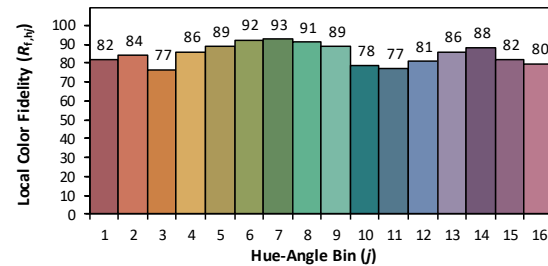
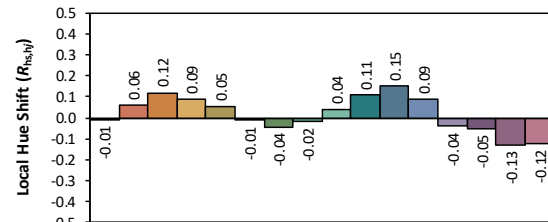
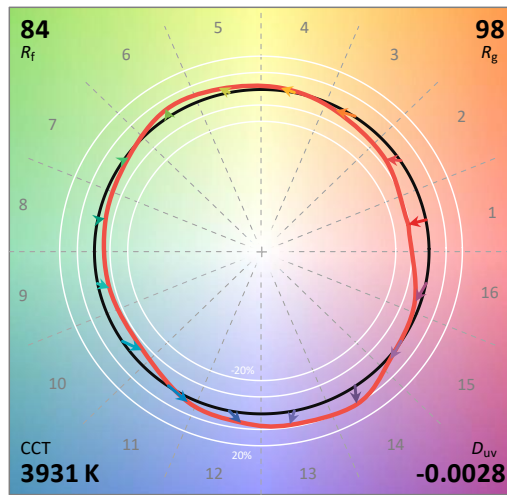
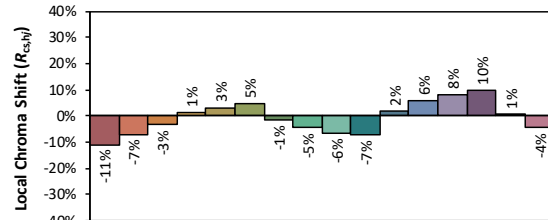
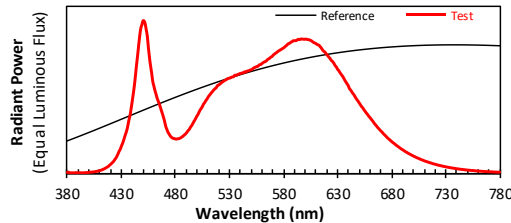
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2025/2/21

Model: SMSBULLET2X20 @40W4000K



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

x 0.3815
 y 0.3713
 u' 0.2280
 v' 0.4993

CIE 13.3-1995
(CRI)

R_a 84
 R_g 16

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	7.90E-06	447	9.00E-04	514	5.33E-04	581	8.26E-04	648	4.83E-04	715	7.26E-05
381	1.01E-05	448	9.49E-04	515	5.42E-04	582	8.32E-04	649	4.73E-04	716	7.07E-05
382	6.20E-06	449	9.71E-04	516	5.50E-04	583	8.37E-04	650	4.62E-04	717	6.83E-05
383	5.40E-06	450	9.97E-04	517	5.56E-04	584	8.45E-04	651	4.52E-04	718	6.59E-05
384	5.60E-06	451	9.96E-04	518	5.63E-04	585	8.49E-04	652	4.40E-04	719	6.38E-05
385	5.70E-06	452	9.78E-04	519	5.75E-04	586	8.53E-04	653	4.32E-04	720	6.21E-05
386	5.10E-06	453	9.39E-04	520	5.79E-04	587	8.58E-04	654	4.22E-04	721	6.04E-05
387	6.10E-06	454	8.97E-04	521	5.84E-04	588	8.61E-04	655	4.12E-04	722	5.80E-05
388	7.10E-06	455	8.23E-04	522	5.90E-04	589	8.67E-04	656	4.02E-04	723	5.62E-05
389	5.10E-06	456	7.59E-04	523	5.96E-04	590	8.67E-04	657	3.93E-04	724	5.43E-05
390	5.70E-06	457	7.04E-04	524	6.00E-04	591	8.68E-04	658	3.84E-04	725	5.32E-05
391	6.50E-06	458	6.59E-04	525	6.05E-04	592	8.69E-04	659	3.74E-04	726	5.12E-05
392	6.00E-06	459	6.04E-04	526	6.10E-04	593	8.74E-04	660	3.66E-04	727	4.97E-05
393	6.00E-06	460	5.74E-04	527	6.13E-04	594	8.76E-04	661	3.57E-04	728	4.79E-05
394	5.70E-06	461	5.44E-04	528	6.19E-04	595	8.75E-04	662	3.48E-04	729	4.65E-05
395	5.00E-06	462	5.21E-04	529	6.22E-04	596	8.79E-04	663	3.39E-04	730	4.55E-05
396	6.60E-06	463	4.95E-04	530	6.23E-04	597	8.78E-04	664	3.29E-04	731	4.36E-05
397	7.00E-06	464	4.75E-04	531	6.26E-04	598	8.78E-04	665	3.20E-04	732	4.23E-05
398	7.60E-06	465	4.57E-04	532	6.30E-04	599	8.77E-04	666	3.12E-04	733	4.10E-05
399	7.10E-06	466	4.35E-04	533	6.31E-04	600	8.77E-04	667	3.03E-04	734	3.97E-05
400	8.30E-06	467	4.13E-04	534	6.35E-04	601	8.78E-04	668	2.95E-04	735	3.83E-05
401	9.00E-06	468	3.91E-04	535	6.43E-04	602	8.75E-04	669	2.87E-04	736	3.72E-05
402	1.03E-05	469	3.68E-04	536	6.42E-04	603	8.75E-04	670	2.79E-04	737	3.64E-05
403	1.08E-05	470	3.41E-04	537	6.44E-04	604	8.73E-04	671	2.73E-04	738	3.46E-05
404	1.15E-05	471	3.10E-04	538	6.48E-04	605	8.70E-04	672	2.64E-04	739	3.39E-05
405	1.22E-05	472	2.91E-04	539	6.50E-04	606	8.66E-04	673	2.57E-04	740	3.27E-05
406	1.37E-05	473	2.73E-04	540	6.54E-04	607	8.60E-04	674	2.50E-04	741	3.18E-05
407	1.53E-05	474	2.61E-04	541	6.55E-04	608	8.56E-04	675	2.43E-04	742	3.06E-05
408	1.65E-05	475	2.49E-04	542	6.58E-04	609	8.52E-04	676	2.35E-04	743	2.99E-05
409	1.81E-05	476	2.40E-04	543	6.58E-04	610	8.49E-04	677	2.29E-04	744	2.84E-05
410	2.02E-05	477	2.34E-04	544	6.65E-04	611	8.43E-04	678	2.23E-04	745	2.80E-05
411	2.26E-05	478	2.31E-04	545	6.63E-04	612	8.40E-04	679	2.16E-04	746	2.70E-05
412	2.46E-05	479	2.29E-04	546	6.67E-04	613	8.37E-04	680	2.10E-04	747	2.64E-05
413	2.84E-05	480	2.27E-04	547	6.71E-04	614	8.28E-04	681	2.04E-04	748	2.52E-05
414	3.12E-05	481	2.26E-04	548	6.71E-04	615	8.20E-04	682	1.99E-04	749	2.46E-05
415	3.51E-05	482	2.28E-04	549	6.76E-04	616	8.09E-04	683	1.93E-04	750	2.37E-05
416	3.89E-05	483	2.28E-04	550	6.78E-04	617	8.00E-04	684	1.87E-04	751	2.30E-05
417	4.36E-05	484	2.31E-04	551	6.81E-04	618	7.95E-04	685	1.82E-04	752	2.28E-05
418	4.79E-05	485	2.34E-04	552	6.87E-04	619	7.87E-04	686	1.77E-04	753	2.16E-05
419	5.49E-05	486	2.40E-04	553	6.92E-04	620	7.77E-04	687	1.72E-04	754	2.10E-05
420	6.07E-05	487	2.44E-04	554	6.94E-04	621	7.69E-04	688	1.67E-04	755	2.08E-05
421	6.74E-05	488	2.51E-04	555	6.99E-04	622	7.60E-04	689	1.62E-04	756	2.02E-05
422	7.46E-05	489	2.57E-04	556	6.99E-04	623	7.52E-04	690	1.57E-04	757	1.92E-05
423	8.20E-05	490	2.64E-04	557	7.06E-04	624	7.42E-04	691	1.53E-04	758	1.83E-05
424	9.29E-05	491	2.74E-04	558	7.11E-04	625	7.34E-04	692	1.48E-04	759	1.81E-05
425	1.02E-04	492	2.83E-04	559	7.12E-04	626	7.26E-04	693	1.43E-04	760	1.75E-05
426	1.16E-04	493	2.91E-04	560	7.18E-04	627	7.15E-04	694	1.40E-04	761	1.69E-05
427	1.31E-04	494	3.04E-04	561	7.24E-04	628	7.03E-04	695	1.35E-04	762	1.63E-05
428	1.47E-04	495	3.13E-04	562	7.28E-04	629	6.96E-04	696	1.31E-04	763	1.58E-05
429	1.60E-04	496	3.25E-04	563	7.31E-04	630	6.81E-04	697	1.27E-04	764	1.51E-05
430	1.79E-04	497	3.39E-04	564	7.35E-04	631	6.74E-04	698	1.23E-04	765	1.50E-05
431	1.96E-04	498	3.50E-04	565	7.43E-04	632	6.62E-04	699	1.20E-04	766	1.43E-05
432	2.16E-04	499	3.64E-04	566	7.48E-04	633	6.52E-04	700	1.16E-04	767	1.41E-05
433	2.39E-04	500	3.77E-04	567	7.52E-04	634	6.42E-04	701	1.13E-04	768	1.36E-05
434	2.61E-04	501	3.88E-04	568	7.59E-04	635	6.32E-04	702	1.09E-04	769	1.30E-05
435	2.82E-04	502	4.03E-04	569	7.63E-04	636	6.20E-04	703	1.06E-04	770	1.28E-05
436	3.13E-04	503	4.17E-04	570	7.69E-04	637	6.07E-04	704	1.02E-04	771	1.24E-05
437	3.50E-04	504	4.27E-04	571	7.77E-04	638	5.95E-04	705	1.00E-04	772	1.20E-05
438	3.79E-04	505	4.38E-04	572	7.82E-04	639	5.84E-04	706	9.61E-05	773	1.20E-05
439	4.22E-04	506	4.54E-04	573	7.87E-04	640	5.73E-04	707	9.34E-05	774	1.15E-05
440	4.71E-04	507	4.63E-04	574	7.93E-04	641	5.55E-04	708	9.00E-05	775	1.09E-05
441	5.19E-04	508	4.75E-04	575	7.98E-04	642	5.47E-04	709	8.80E-05	776	1.06E-05
442	5.72E-04	509	4.85E-04	576	8.02E-04	643	5.37E-04	710	8.47E-05	777	1.03E-05
443	6.37E-04	510	4.96E-04	577	8.07E-04	644	5.25E-04	711	8.23E-05	778	1.00E-05
444	7.06E-04	511	5.07E-04	578	8.11E-04	645	5.17E-04	712	7.98E-05	779	1.00E-05
445	7.69E-04	512	5.16E-04	579	8.16E-04	646	5.05E-04	713	7.75E-05	780	1.00E-05
446	8.37E-04	513	5.25E-04	580	8.20E-04	647	4.93E-04	714	7.50E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	SMSBULLET2X20 @40W4000K	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

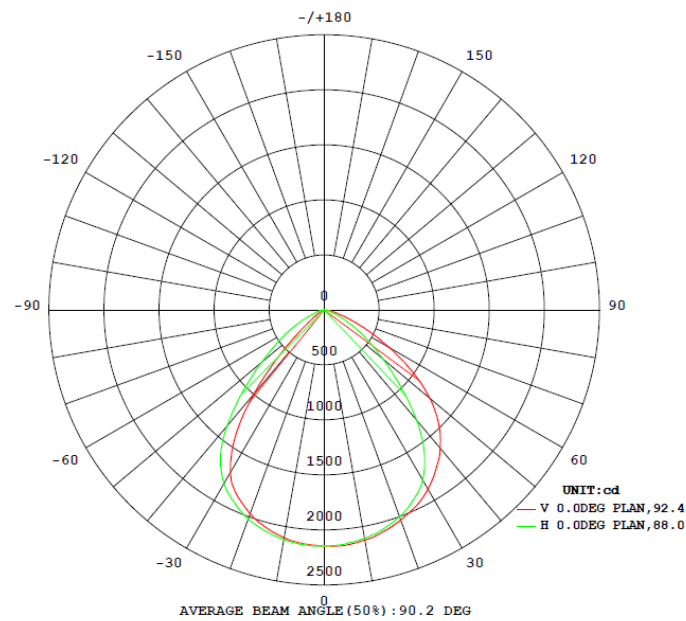
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.335	39.7	0.988
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

Test Result

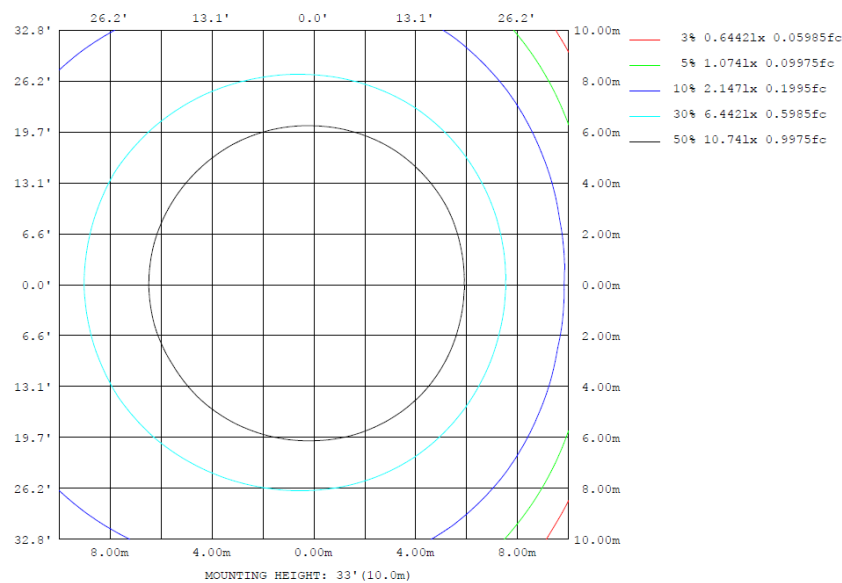
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	NEMA Type
	C0-180	C90-270	C0-180	C90-270		(0°-90°)	
4189	124.0	129.0	92.2	88.5	105.5	100.0%	6H x 6V

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	Φ zone	Φ total	Φ lum, lamp
10	2103	2099	2108	2114	2124	2120	2119	2109	0- 10	203.5	203.5	4.86,4.86
20	1972	1977	1999	2017	2032	2020	2021	1989	10- 20	583.6	787.1	18.8,18.8
30	1708	1752	1787	1837	1883	1852	1822	1773	20- 30	882.1	1669	39.8,39.8
40	994.0	1131	1304	1532	1639	1583	1372	1193	30- 40	998.3	2668	63.7,63.7
50	241.3	444.9	695.5	1010	1255	1081	747.2	493.6	40- 50	799.0	3467	82.8,82.8
60	58.67	115.2	318.0	441.1	678.5	490.2	347.7	138.4	50- 60	460.8	3927	93.8,93.8
70	2.328	22.46	97.97	148.3	238.1	166.7	112.2	27.88	60- 70	195.0	4122	98.4,98.4
80	0.0859	3.975	9.156	25.00	56.32	32.33	20.68	5.385	70- 80	57.60	4180	99.8,99.8
90	0	0	0	0	0	0	0	0	80- 90	9.119	4189	100,100
100	0	0	0	0	0	0	0	0	90-100	0	4189	100,100
110	0	0	0	0	0	0	0	0	100-110	0	4189	100,100
120	0	0	0	0	0	0	0	0	110-120	0	4189	100,100
130	0	0	0	0	0	0	0	0	120-130	0	4189	100,100
140	0	0	0	0	0	0	0	0	130-140	0	4189	100,100
150	0	0	0	0	0	0	0	0	140-150	0	4189	100,100
160	0	0	0	0	0	0	0	0	150-160	0	4189	100,100
170	0	0	0	0	0	0	0	0	160-170	0	4189	100,100
180	0	0	0	0	0	0	0	0	170-180	0	4189	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

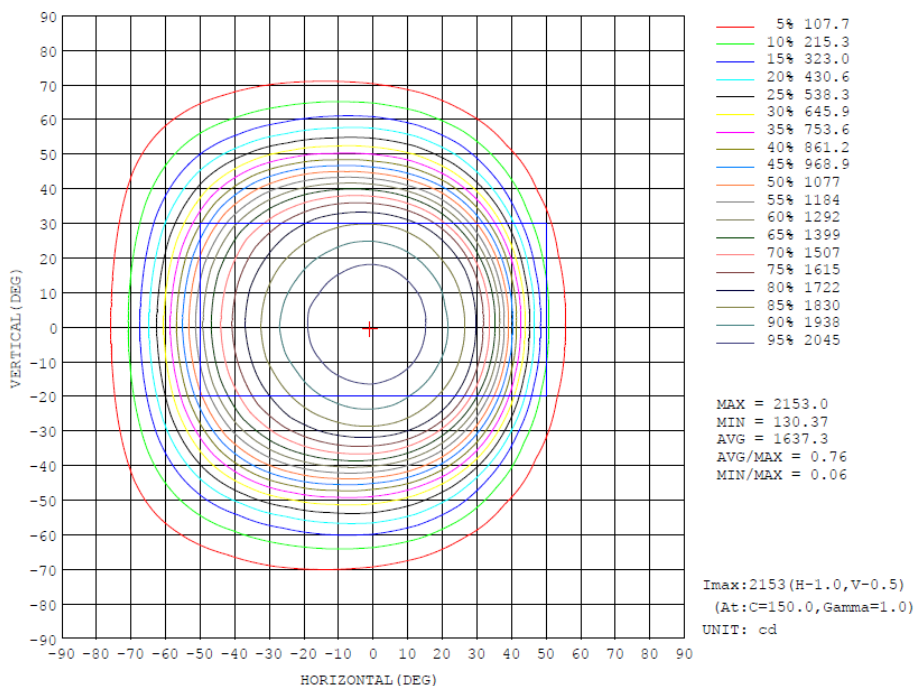
Zonal (lm)		Total (lm)		Percent
0-10	203.46	0-10	203.46	4.86%
10-20	583.63	0-20	787.09	18.79%
20-30	882.08	0-30	1669.17	39.85%
30-40	998.35	0-40	2667.52	63.68%
40-50	799.04	0-50	3466.56	82.75%
50-60	460.75	0-60	3927.31	93.75%
60-70	194.97	0-70	4122.28	98.41%
70-80	57.60	0-80	4179.88	99.78%
80-90	9.12	0-90	4189.00	100.00%
90-100	0.00	0-100	4189.00	100.00%
100-110	0.00	0-110	4189.00	100.00%
110-120	0.00	0-120	4189.00	100.00%
120-130	0.00	0-130	4189.00	100.00%
130-140	0.00	0-140	4189.00	100.00%
140-150	0.00	0-150	4189.00	100.00%
150-160	0.00	0-160	4189.00	100.00%
160-170	0.00	0-170	4189.00	100.00%
170-180	0.00	0-180	4189.00	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	0.12	0.15	0.17	0.24	0.34	0.40	0.24	0.11	0.07	0.08	0.07	0.03	0.01	0.00	0.00	0.00	2.11	0.00	
	80	0.03	0.14	0.31	0.55	0.89	1.39	1.82	2.03	1.98	1.66	1.16	0.67	0.33	0.13	0.04	0.01	0.00	0.00	13.1	0.00	
	70	0.04	0.23	0.66	1.49	2.74	4.19	5.52	6.47	6.72	6.00	4.44	2.52	1.11	0.40	0.12	0.02	0.00	0.00	42.7	16.6	
	60	0.05	0.36	1.27	3.22	6.20	9.78	13.1	15.5	16.3	15.2	12.0	7.43	3.26	1.02	0.26	0.04	0.00	0.00	105	95.0	
	50	0.06	0.52	2.14	5.88	12.1	19.8	26.5	31.0	32.5	30.5	24.9	16.2	7.55	2.40	0.54	0.08	0.00	0.00	213	207	
	40	0.07	0.69	3.20	9.36	19.7	30.8	40.1	46.6	49.5	48.2	41.8	29.6	14.8	4.45	1.01	0.13	0.01	0.00	340	335	
	30	0.08	0.86	4.28	12.9	26.0	38.4	48.1	54.7	58.3	57.9	53.0	42.0	23.8	7.46	1.53	0.20	0.01	0.00	429	426	
	20	0.09	1.00	5.15	15.6	29.8	42.2	51.9	58.9	62.6	62.4	57.7	48.7	31.0	10.5	1.99	0.28	0.01	0.00	480	476	
	10	0.09	1.09	5.66	16.9	31.3	43.9	53.9	60.9	64.6	64.3	59.8	51.0	34.5	12.4	2.26	0.31	0.01	0.00	503	500	
	0	0.09	1.08	5.62	16.8	31.2	43.7	53.8	60.8	64.5	64.1	59.7	50.8	34.2	12.2	2.21	0.31	0.01	0.00	501	498	
-30	-10	0.08	0.99	5.03	15.2	29.2	41.7	51.5	58.6	62.2	61.9	57.2	48.1	30.0	10.0	1.89	0.26	0.01	0.00	474	470	
	-20	0.08	0.84	4.11	12.4	24.9	37.4	47.2	54.1	57.6	57.1	52.2	40.6	22.4	6.85	1.42	0.17	0.01	0.00	419	415	
	-30	0.07	0.67	3.03	8.82	18.5	29.2	38.4	44.8	47.7	46.5	39.8	27.8	13.5	3.94	0.90	0.10	0.00	0.00	324	319	
	-40	0.06	0.50	2.00	5.43	11.1	18.2	24.6	28.9	30.4	28.6	23.1	14.8	6.65	2.05	0.44	0.06	0.00	0.00	197	190	
	-50	0.05	0.34	1.18	2.90	5.59	8.84	12.0	14.3	15.2	14.0	10.9	6.56	2.74	0.83	0.21	0.03	0.00	0.00	95.7	84.8	
	-60	0.04	0.22	0.62	1.32	2.38	3.72	4.98	5.85	6.04	5.34	3.86	2.10	0.90	0.31	0.09	0.01	0.00	0.00	37.8	11.5	
	-70	0.03	0.13	0.29	0.48	0.70	1.11	1.53	1.75	1.66	1.34	0.88	0.49	0.24	0.10	0.03	0.00	0.00	0.00	10.7	0.00	
	-80	0.01	0.06	0.12	0.15	0.15	0.17	0.23	0.28	0.15	0.06	0.04	0.05	0.04	0.02	0.01	0.00	0.00	0.00	1.53	0.00	
	-90																					
			-90	-80	-70	-60	-50	-40	-30	-20	HORIZONTAL (DEG)	20	30	40	50	60	70	80	90			
Φ t	1.01	9.79	44.8	129	253	375	476	546	578	565	502	390	227	75.2	14.9	2.00	0.07	0.00	4189	---		
Φ a	0.00	0.41	34.3	121	244	365	466	536	569	556	493	380	217	61.6	0.73	0.00	0.00	0.00	---	4045		

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	7.47	10.4	12.6	14.0	14.9	15.2	14.8	13.9	12.9	14.3	15.8	17.5	20.7	23.8	26.2	21.2	15.3	9.16
-70	0.00	10.6	15.9	21.5	26.6	31.9	38.0	44.4	51.9	60.7	72.4	84.5	94.8	102	106	108	108	104	98.0
-60	0.00	13.2	22.2	33.0	46.7	65.0	86.1	111	141	171	199	230	257	280	302	318	326	326	318
-50	0.00	15.8	28.9	48.0	77.7	116	165	225	294	366	438	511	579	628	675	701	713	714	696
-40	0.00	18.4	36.2	67.2	115	185	277	393	531	681	826	960	1073	1164	1234	1285	1314	1322	1304
-30	0.00	20.7	43.3	85.5	156	263	414	597	807	1021	1212	1366	1491	1592	1668	1728	1765	1787	1787
-20	0.00	22.4	49.7	103	196	338	541	788	1048	1279	1465	1611	1720	1808	1880	1935	1974	1998	1999
-10	0.00	23.6	54.2	116	225	396	634	915	1194	1421	1593	1725	1837	1924	1992	2044	2081	2108	2108
0	0.00	24.1	56.3	122	238	423	679	977	1255	1472	1639	1768	1883	1969	2032	2085	2124	2147	2147
10	0.00	23.6	54.6	117	228	402	644	932	1215	1438	1606	1741	1847	1931	1998	2050	2091	2117	2119
20	0.00	22.5	50.3	105	201	349	558	816	1089	1318	1498	1638	1742	1829	1894	1947	1991	2013	2021
30	0.00	20.8	44.0	88.0	162	277	435	629	852	1077	1271	1420	1542	1642	1716	1768	1803	1822	1822
40	0.00	18.6	36.8	68.8	121	197	296	422	573	733	890	1031	1146	1235	1309	1356	1385	1392	1372
50	0.00	15.9	29.3	50.1	82.2	124	180	247	322	402	484	565	636	689	734	760	769	769	747
60	0.00	13.3	22.8	34.1	49.8	69.7	94.7	125	158	192	223	255	283	307	330	346	354	355	348
70	0.00	10.7	16.2	22.4	27.9	34.2	41.7	50.9	61.8	73.5	86.5	98.4	108	115	120	122	121	118	112
80	0.00	7.36	10.5	12.8	14.3	15.2	15.4	16.3	17.0	17.8	21.1	24.4	27.6	29.9	31.8	33.0	29.2	25.1	20.7
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)		UNIT: cd																	
V (DEG)	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	
-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	7.56	5.77	3.89	4.10	3.49	4.88	3.83	2.88	2.01	1.28	0.71	0.31	0.19	0.13	0.11	0.11	0.10	0.00	
-70	88.6	77.7	65.2	50.5	36.8	25.9	18.5	12.4	8.09	4.97	2.58	1.12	0.53	0.21	0.09	0.10	0.11	0.00	
-60	295	266	227	180	132	91.0	58.7	34.6	21.9	13.3	7.21	3.36	1.36	0.41	0.12	0.09	0.11	0.00	
-50	662	610	538	453	361	260	168	99.8	57.8	30.1	15.2	7.19	2.64	0.68	0.20	0.09	0.10	0.00	
-40	1261	1184	1075	932	755	558	369	224	125	66.7	33.1	13.3	4.28	1.08	0.30	0.10	0.10	0.00	
-30	1770	1720	1627	1468	1258	1006	717	427	221	118	61.8	25.4	7.20	1.68	0.39	0.11	0.09	0.00	
-20	1986	1942	1884	1806	1672	1402	1069	700	365	165	88.0	41.7	12.0	2.30	0.42	0.12	0.09	0.00	
-10	2090	2059	2009	1923	1825	1643	1323	908	498	222	109	54.4	16.8	2.63	0.38	0.10	0.09	0.00	
0	2133	2103	2048	1972	1866	1708	1413	994	547	241	115	58.7	18.2	2.33	0.24	0.09	0.09	0.00	
10	2108	2071	2017	1936	1832	1666	1353	938	515	234	112	56.0	18.2	3.08	0.48	0.13	0.09	0.00	
20	2003	1965	1902	1818	1705	1454	1123	740	389	180	92.3	44.9	14.3	3.03	0.60	0.16	0.10	0.00	
30	1804	1758	1682	1536	1322	1071	769	468	248	130	67.8	29.9	9.26	2.48	0.59	0.16	0.10	0.00	
40	1326	1246	1138	1000	817	612	412	256	144	76.0	39.0	17.0	6.00	1.68	0.49	0.15	0.11	0.00	
50	716	665	589	497	400	295	198	120	69.0	36.9	19.6	9.39	3.76	1.08	0.34	0.14	0.11	0.00	
60	325	295	255	206	156	110	71.8	43.3	27.3	16.8	9.28	4.67	2.05	0.69	0.21	0.12	0.12	0.00	
70	102	90.3	76.8	60.9	45.7	32.9	23.6	15.9	10.3	6.57	3.71	1.77	0.84	0.34	0.14	0.13	0.14	0.00	
80	16.2	11.4	6.96	6.88	7.02	7.42	5.77	4.28	2.95	1.93	1.09	0.47	0.31	0.21	0.17	0.16	0.13	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.	SMSBULLET2X20 @40W4000K	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	0.335	39.7	0.988	14.73

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*****