

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77-2017

Prepared For

RAB Lighting Inc.

Prepared By

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Issue Date: 2023-06-14
Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		6552
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		157.5
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		6328
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	152.1
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		41.6
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.78
			277V	13.12
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.991
			277V	0.844
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	3985±275	4071
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		76.8
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-15
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		78
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		94
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-15%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		6.9%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		277.0
(Goniophotometer – Section 4.2)		Non-Worst Case		120.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.178
(Goniophotometer – Section 4.2)		Non-Worst Case		0.347
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		41.6
(Goniophotometer – Section 4.2)		Non-Worst Case		41.3

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34M @ 40W / 4000K	230612002-S1
2	Goniophotometer Test	2023-06-13	W34M @ 40W / 4000K	230612002-S1
3	THD and PF Test	2023-06-13	W34M @ 40W / 4000K	230612002-S1

Remark (If any)

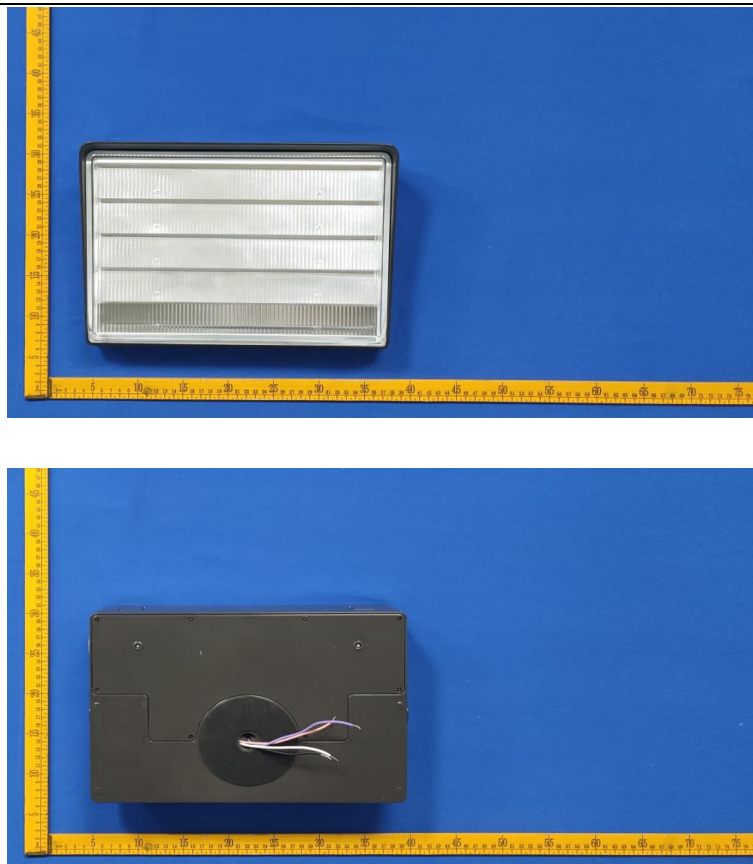
1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

3.0 Product Description

Luminaire Description: Model No. W34M @ 40W / 4000K, color tunable from 3000K, 4000K and 5000K.

Electrical Specification: 120-277Vac, 50/60Hz

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	W34M @ 40W / 4000K	Sample ID	230612002-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

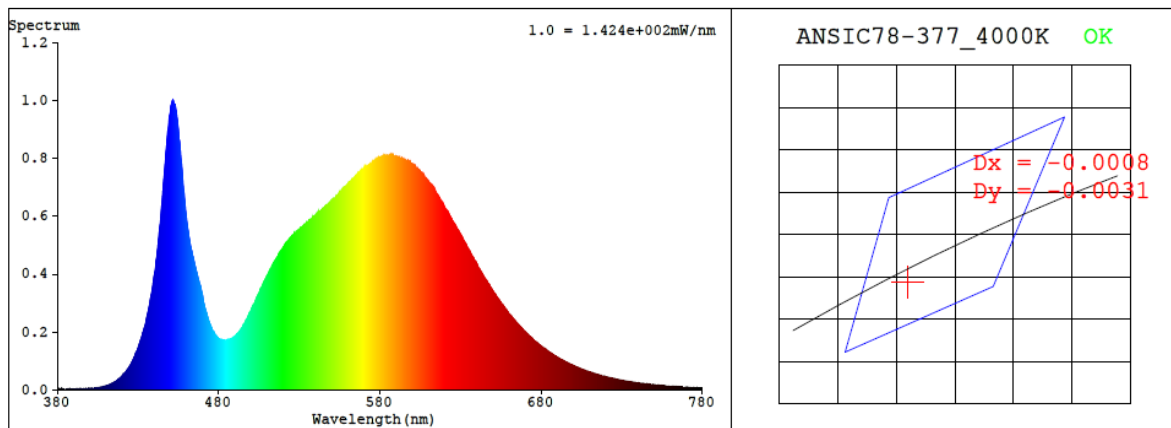
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.347	41.3	0.991
277.0	60	0.178	41.6	0.844

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4071	76.8	-15	-0.0012	78	94	-15%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3766$ $y = 0.3717$ / $u' = 0.2246$ $v' = 0.4988$ ($duv = -1.22e-03$)

CCT= 4071K Prcp WL: Ld=579.5nm Purity=24.6%

Peak WL: Lp=452nm FWHM: =20.2nm Ratio:R=17.3% G=79.6% B=3.2%

Render Index: Ra = 76.8 AvgR = 68.1 TM30:Rf=78 Rg=94

EEL: 0.08882 A++ Highest

R1 =74 R2 =84 R3 =91 R4 =74 R5 =74 R6 =77 R7 =83

R8 =56 R9 =-15 R10=62 R11=71 R12=50 R13=77 R14=95 R15=69

4.1 Integrating Sphere Test

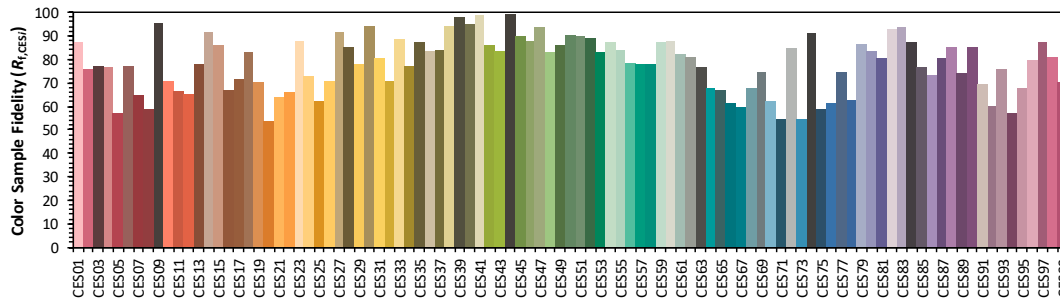
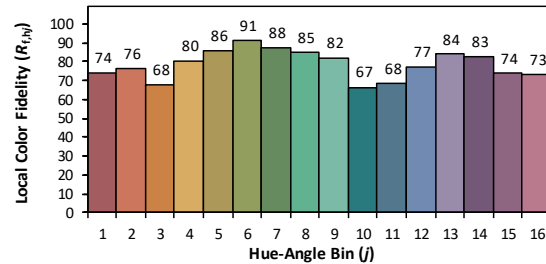
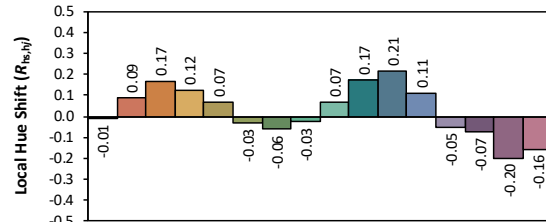
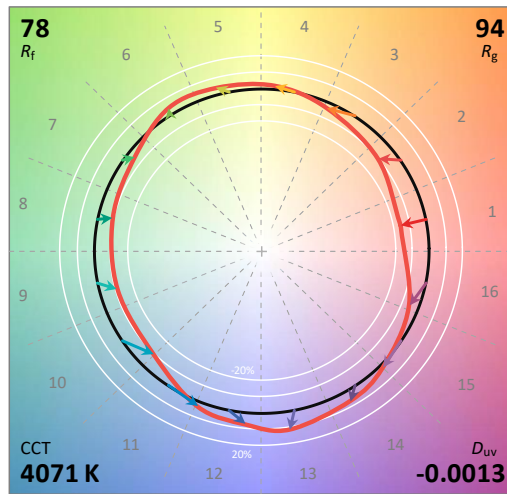
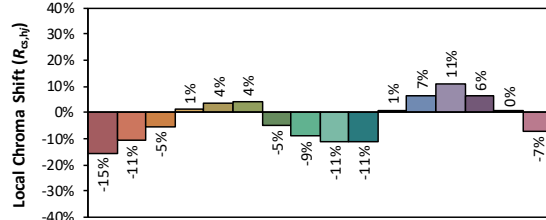
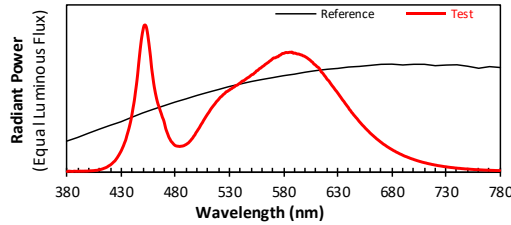
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34M @ 40W / 4000K



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

x 0.3765
 y 0.3716
 u' 0.2246
 v' 0.4987

CIE 13.3-1995
(CRI)

R_a 77
 R_g -15

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	1.00E-06	447	8.01E-04	514	4.37E-04	581	8.06E-04	648	3.61E-04	715	5.29E-05
381	3.30E-06	448	8.66E-04	515	4.47E-04	582	8.09E-04	649	3.51E-04	716	5.17E-05
382	3.30E-06	449	9.20E-04	516	4.56E-04	583	8.09E-04	650	3.42E-04	717	4.97E-05
383	2.50E-06	450	9.61E-04	517	4.65E-04	584	8.08E-04	651	3.34E-04	718	4.82E-05
384	2.10E-06	451	9.92E-04	518	4.75E-04	585	8.10E-04	652	3.25E-04	719	4.70E-05
385	1.70E-06	452	9.96E-04	519	4.83E-04	586	8.11E-04	653	3.17E-04	720	4.52E-05
386	3.20E-06	453	9.85E-04	520	4.91E-04	587	8.11E-04	654	3.10E-04	721	4.43E-05
387	3.30E-06	454	9.50E-04	521	5.00E-04	588	8.12E-04	655	3.02E-04	722	4.26E-05
388	2.60E-06	455	8.99E-04	522	5.08E-04	589	8.04E-04	656	2.93E-04	723	4.11E-05
389	2.70E-06	456	8.41E-04	523	5.13E-04	590	8.05E-04	657	2.86E-04	724	4.01E-05
390	3.10E-06	457	7.79E-04	524	5.22E-04	591	8.05E-04	658	2.79E-04	725	3.89E-05
391	2.20E-06	458	7.05E-04	525	5.28E-04	592	8.01E-04	659	2.72E-04	726	3.78E-05
392	3.80E-06	459	6.50E-04	526	5.34E-04	593	7.99E-04	660	2.64E-04	727	3.66E-05
393	3.30E-06	460	5.97E-04	527	5.43E-04	594	7.99E-04	661	2.57E-04	728	3.53E-05
394	3.60E-06	461	5.54E-04	528	5.45E-04	595	7.97E-04	662	2.50E-04	729	3.41E-05
395	3.40E-06	462	5.16E-04	529	5.50E-04	596	7.93E-04	663	2.44E-04	730	3.35E-05
396	3.90E-06	463	4.84E-04	530	5.54E-04	597	7.92E-04	664	2.37E-04	731	3.25E-05
397	3.90E-06	464	4.57E-04	531	5.61E-04	598	7.87E-04	665	2.31E-04	732	3.11E-05
398	3.90E-06	465	4.38E-04	532	5.64E-04	599	7.85E-04	666	2.24E-04	733	3.03E-05
399	4.40E-06	466	4.13E-04	533	5.70E-04	600	7.81E-04	667	2.19E-04	734	2.93E-05
400	4.90E-06	467	3.93E-04	534	5.74E-04	601	7.77E-04	668	2.13E-04	735	2.84E-05
401	5.70E-06	468	3.69E-04	535	5.79E-04	602	7.72E-04	669	2.07E-04	736	2.77E-05
402	6.00E-06	469	3.52E-04	536	5.85E-04	603	7.66E-04	670	2.01E-04	737	2.70E-05
403	6.40E-06	470	3.26E-04	537	5.87E-04	604	7.61E-04	671	1.96E-04	738	2.59E-05
404	6.90E-06	471	2.94E-04	538	5.92E-04	605	7.55E-04	672	1.89E-04	739	2.49E-05
405	7.50E-06	472	2.73E-04	539	5.98E-04	606	7.48E-04	673	1.85E-04	740	2.45E-05
406	8.70E-06	473	2.54E-04	540	6.03E-04	607	7.43E-04	674	1.80E-04	741	2.35E-05
407	8.90E-06	474	2.34E-04	541	6.09E-04	608	7.32E-04	675	1.75E-04	742	2.28E-05
408	1.03E-05	475	2.21E-04	542	6.16E-04	609	7.27E-04	676	1.69E-04	743	2.26E-05
409	1.22E-05	476	2.07E-04	543	6.17E-04	610	7.21E-04	677	1.65E-04	744	2.16E-05
410	1.33E-05	477	1.99E-04	544	6.22E-04	611	7.13E-04	678	1.60E-04	745	2.08E-05
411	1.54E-05	478	1.90E-04	545	6.28E-04	612	7.09E-04	679	1.56E-04	746	2.02E-05
412	1.75E-05	479	1.82E-04	546	6.33E-04	613	7.02E-04	680	1.51E-04	747	1.97E-05
413	1.99E-05	480	1.77E-04	547	6.38E-04	614	6.91E-04	681	1.47E-04	748	1.86E-05
414	2.30E-05	481	1.75E-04	548	6.42E-04	615	6.77E-04	682	1.43E-04	749	1.86E-05
415	2.55E-05	482	1.73E-04	549	6.48E-04	616	6.72E-04	683	1.39E-04	750	1.81E-05
416	2.86E-05	483	1.72E-04	550	6.54E-04	617	6.62E-04	684	1.35E-04	751	1.73E-05
417	3.25E-05	484	1.71E-04	551	6.59E-04	618	6.52E-04	685	1.31E-04	752	1.72E-05
418	3.79E-05	485	1.73E-04	552	6.62E-04	619	6.43E-04	686	1.27E-04	753	1.64E-05
419	4.21E-05	486	1.73E-04	553	6.69E-04	620	6.31E-04	687	1.24E-04	754	1.59E-05
420	4.66E-05	487	1.75E-04	554	6.75E-04	621	6.23E-04	688	1.20E-04	755	1.55E-05
421	5.28E-05	488	1.77E-04	555	6.84E-04	622	6.16E-04	689	1.17E-04	756	1.48E-05
422	5.95E-05	489	1.81E-04	556	6.87E-04	623	6.05E-04	690	1.13E-04	757	1.43E-05
423	6.67E-05	490	1.85E-04	557	6.94E-04	624	5.94E-04	691	1.09E-04	758	1.39E-05
424	7.29E-05	491	1.90E-04	558	7.01E-04	625	5.84E-04	692	1.06E-04	759	1.37E-05
425	8.29E-05	492	1.95E-04	559	7.04E-04	626	5.75E-04	693	1.03E-04	760	1.31E-05
426	9.30E-05	493	2.03E-04	560	7.11E-04	627	5.65E-04	694	1.01E-04	761	1.32E-05
427	1.05E-04	494	2.11E-04	561	7.16E-04	628	5.55E-04	695	9.75E-05	762	1.24E-05
428	1.17E-04	495	2.20E-04	562	7.21E-04	629	5.46E-04	696	9.50E-05	763	1.20E-05
429	1.30E-04	496	2.29E-04	563	7.28E-04	630	5.36E-04	697	9.17E-05	764	1.17E-05
430	1.43E-04	497	2.41E-04	564	7.33E-04	631	5.26E-04	698	8.90E-05	765	1.12E-05
431	1.60E-04	498	2.50E-04	565	7.38E-04	632	5.15E-04	699	8.64E-05	766	1.08E-05
432	1.77E-04	499	2.64E-04	566	7.43E-04	633	5.05E-04	700	8.43E-05	767	1.05E-05
433	1.97E-04	500	2.74E-04	567	7.50E-04	634	4.95E-04	701	8.12E-05	768	1.03E-05
434	2.15E-04	501	2.86E-04	568	7.54E-04	635	4.84E-04	702	7.91E-05	769	1.00E-05
435	2.42E-04	502	2.97E-04	569	7.60E-04	636	4.76E-04	703	7.65E-05	770	9.80E-06
436	2.67E-04	503	3.10E-04	570	7.67E-04	637	4.64E-04	704	7.41E-05	771	9.60E-06
437	2.93E-04	504	3.23E-04	571	7.72E-04	638	4.55E-04	705	7.20E-05	772	9.10E-06
438	3.22E-04	505	3.33E-04	572	7.73E-04	639	4.45E-04	706	6.97E-05	773	8.90E-06
439	3.56E-04	506	3.47E-04	573	7.76E-04	640	4.36E-04	707	6.77E-05	774	8.70E-06
440	3.97E-04	507	3.59E-04	574	7.80E-04	641	4.23E-04	708	6.54E-05	775	8.40E-06
441	4.40E-04	508	3.71E-04	575	7.81E-04	642	4.15E-04	709	6.35E-05	776	7.90E-06
442	4.82E-04	509	3.82E-04	576	7.89E-04	643	4.04E-04	710	6.18E-05	777	7.90E-06
443	5.38E-04	510	3.94E-04	577	7.92E-04	644	3.96E-04	711	6.00E-05	778	7.60E-06
444	5.93E-04	511	4.04E-04	578	7.97E-04	645	3.85E-04	712	5.85E-05	779	7.70E-06
445	6.56E-04	512	4.16E-04	579	8.02E-04	646	3.78E-04	713	5.62E-05	780	7.70E-06
446	7.31E-04	513	4.27E-04	580	8.03E-04	647	3.69E-04	714	5.47E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34M @ 40W / 4000K	Sample ID	230612002-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	42.1

Test Method
<p>The Samples were tested according to the IES LM-79-2008.</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	277.0	60	0.178	41.6	0.844
NON-WORST CASE	120.0	60	0.347	41.3	0.991

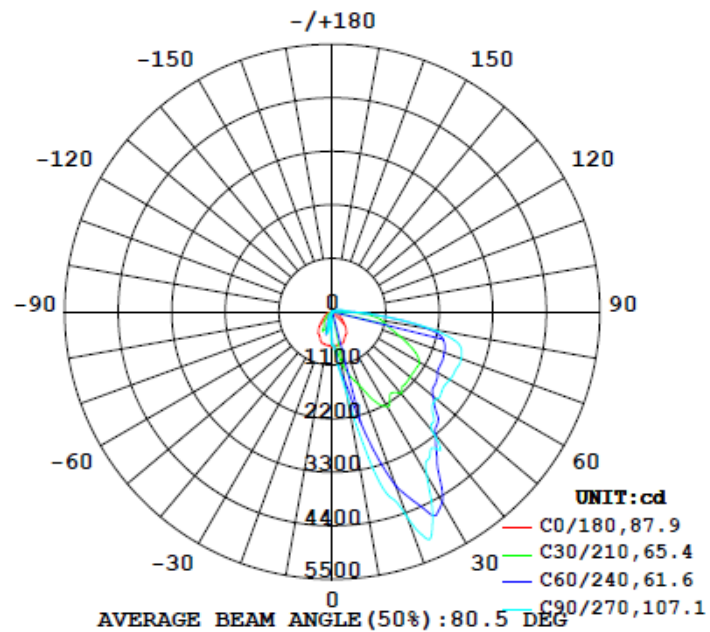
Test Result

Result Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement (80°-90°)	BUG
		C0-180	C90-270	C0-180	C90-270			
0°-180° zones	6552	90.6	124.2	63.8	61.4	157.5	6.7%	B1-U3-G3
0°-90° zones	6328	90.6	124.2	63.8	61.4	152.1	6.9%	B1-U3-G3

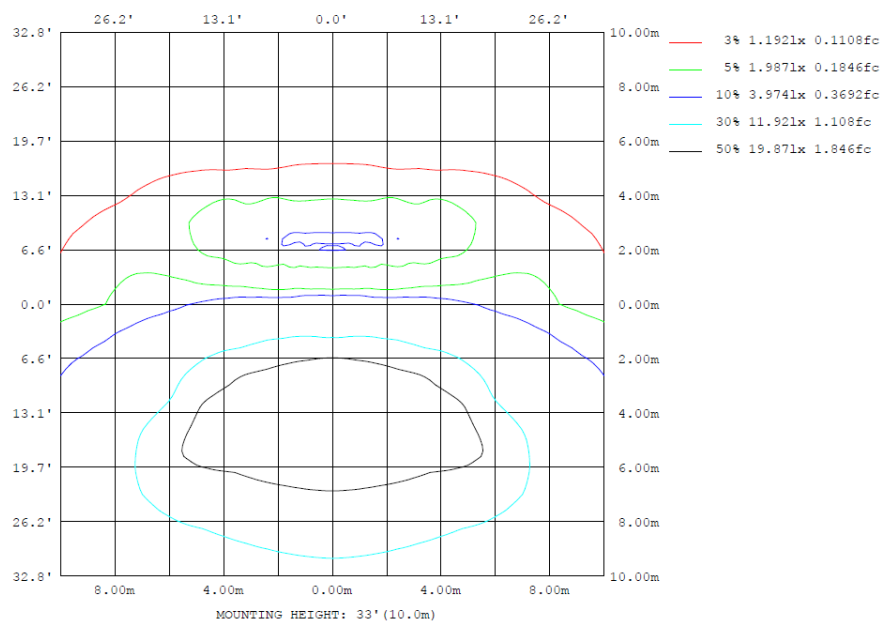
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

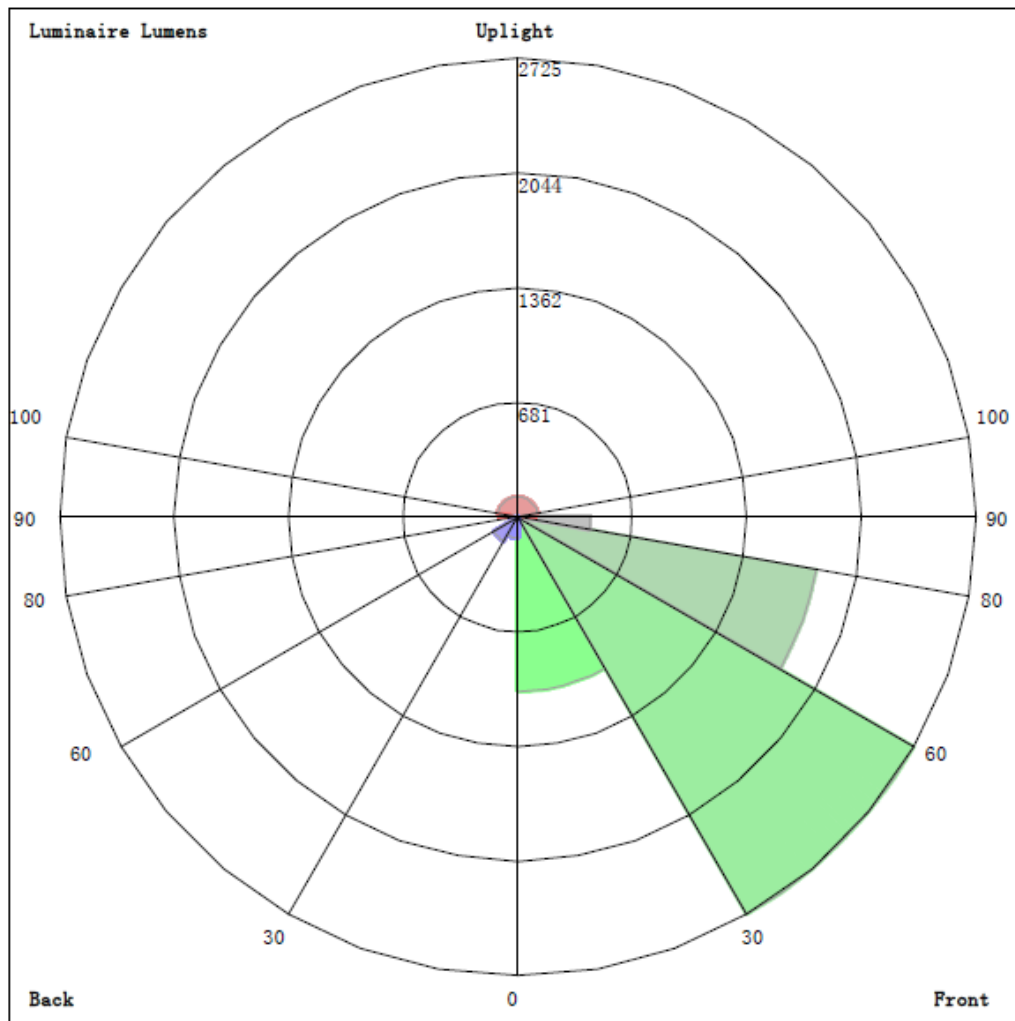
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	± zone	± total	%lum, lamp
10	702.0	1289	1713	1289	702.0	163.2	320.9	163.2	0- 10	59.00	59.00	0.90,0.90
20	669.7	2574	4477	2574	669.7	466.5	244.6	466.5	10- 20	334.3	393.3	6,6
30	540.6	3864	3883	3864	540.6	273.0	126.6	273.0	20- 30	767.1	1160	17.7,17.7
40	437.6	3912	3187	3912	437.6	157.2	46.77	157.2	30- 40	951.2	2112	32.2,32.2
50	275.5	2826	2785	2826	275.5	66.12	8.531	66.12	40- 50	981.1	3093	47.2,47.2
60	180.4	2241	2790	2241	180.4	26.72	2.011	26.72	50- 60	958.2	4051	61.8,61.8
70	113.0	2091	2817	2091	113.0	14.76	0.5707	14.76	60- 70	957.0	5008	76.4,76.4
80	42.03	1870	2095	1870	42.03	11.13	1.385	11.13	70- 80	881.3	5889	89.9,89.9
90	12.52	381.7	418.4	381.7	12.52	7.460	2.182	7.460	80- 90	438.8	6328	96.6,96.6
100	8.781	140.6	216.3	140.6	8.781	4.108	2.624	4.108	90-100	103.7	6432	98.2,98.2
110	6.680	67.82	97.19	67.82	6.680	3.751	2.717	3.751	100-110	49.32	6481	98.9,98.9
120	5.059	55.77	69.33	55.77	5.059	3.522	2.672	3.522	110-120	27.83	6509	99.3,99.3
130	3.939	39.39	56.71	39.39	3.939	3.364	2.992	3.364	120-130	19.50	6528	99.6,99.6
140	3.052	22.13	47.78	22.13	3.052	2.993	3.071	2.993	130-140	13.58	6542	99.8,99.8
150	2.353	12.30	22.47	12.30	2.353	2.595	2.779	2.595	140-150	6.264	6548	99.9,99.9
160	1.791	5.920	10.02	5.920	1.791	2.391	2.047	2.391	150-160	2.717	6551	100,100
170	1.429	1.064	1.157	1.064	1.429	1.750	1.218	1.750	160-170	0.7711	6552	100,100
180	1.628	1.475	1.339	1.475	1.628	1.554	1.317	1.554	170-180	0.1306	6552	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	59.00	0-10	59.00	0.90%
10-20	334.34	0-20	393.34	6.00%
20-30	767.06	0-30	1160.40	17.71%
30-40	951.16	0-40	2111.56	32.23%
40-50	981.09	0-50	3092.65	47.21%
50-60	958.18	0-60	4050.83	61.83%
60-70	956.95	0-70	5007.78	76.44%
70-80	881.28	0-80	5889.06	89.89%
80-90	438.80	0-90	6327.86	96.59%
90-100	103.66	0-100	6431.52	98.17%
100-110	49.32	0-110	6480.84	98.92%
110-120	27.83	0-120	6508.67	99.35%
120-130	19.50	0-130	6528.17	99.64%
130-140	13.58	0-140	6541.75	99.85%
140-150	6.26	0-150	6548.01	99.95%
150-160	2.72	0-160	6550.73	99.99%
160-170	0.77	0-170	6551.50	100.00%
170-180	0.13	0-180	6551.63	100.00%

4.2 Goniophotometer Test

LCS/BUG

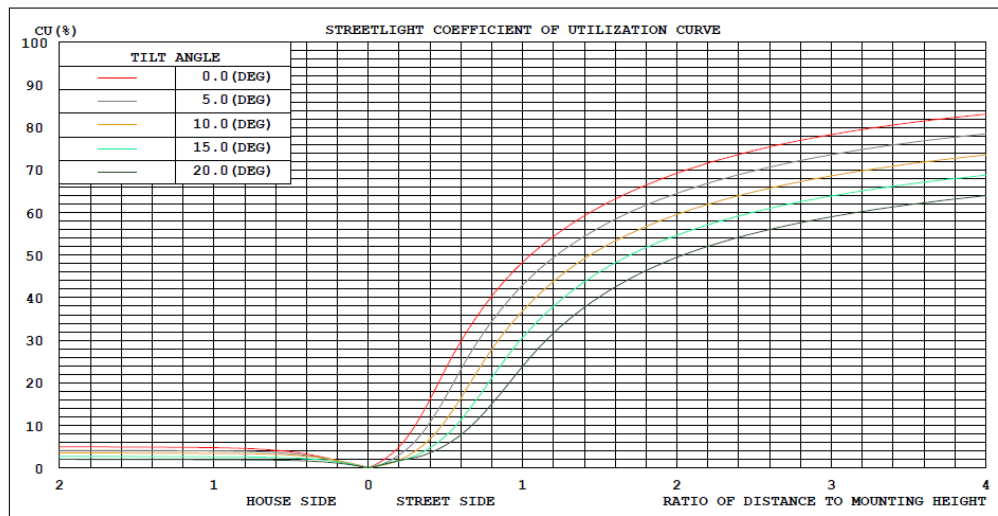


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

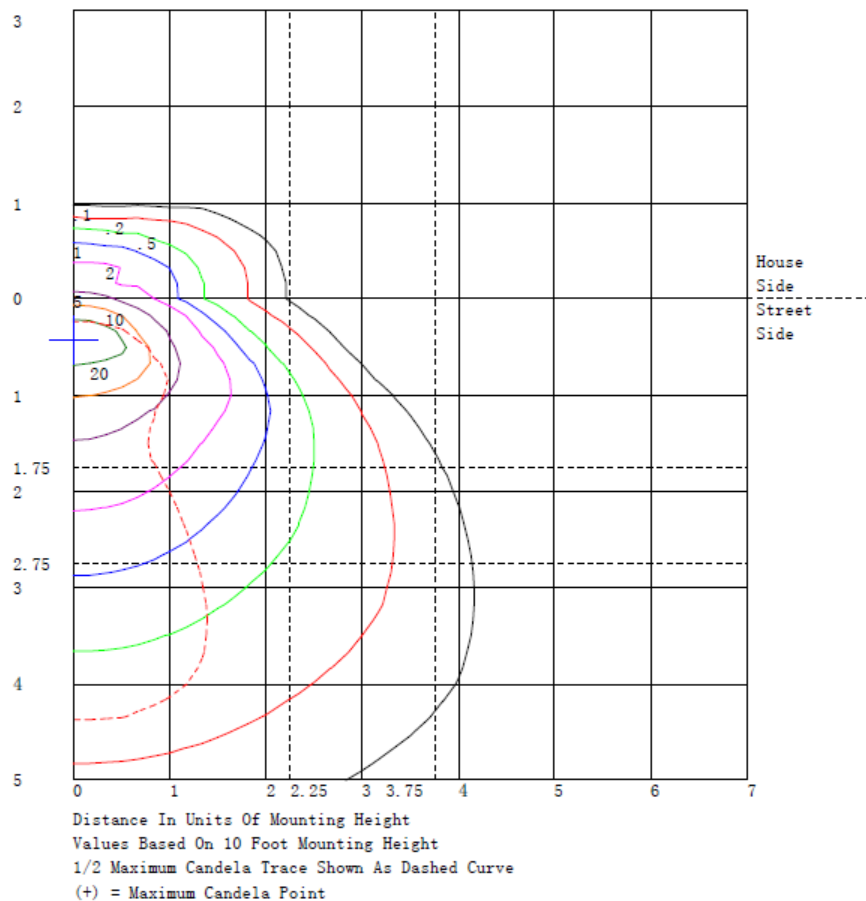
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1036.1	N.A.	15.8
FM - Front-Medium (30-60)	2724.8	N.A.	41.6
FH - Front-High (60-80)	1802.5	N.A.	27.5
FVH - Front-Very High (80-90)	432.3	N.A.	6.6
BL - Back-Low (0-30)	124.3	N.A.	1.9
BM - Back-Medium (30-60)	165.7	N.A.	2.5
BH - Back-High (60-80)	35.7	N.A.	0.5
BVH - Back-Very High (80-90)	6.5	N.A.	0.1
UL - Uplight-Low (90-100)	103.7	N.A.	1.6
UH - Uplight-High (100-180)	120.1	N.A.	1.8
Total	6551.7	N.A.	100.0
BUG Rating	B1-U3-G3		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	689	689	689	689	690	690	690	691	691	691	691	691	691	692	693	694	694	694	694
5	700	690	685	686	692	704	722	746	774	804	830	855	879	902	923	940	953	963	968
10	702	691	706	750	834	936	1043	1132	1215	1289	1344	1393	1439	1496	1552	1604	1653	1691	1713
15	693	737	806	902	1038	1190	1346	1462	1589	1742	1983	2249	2521	2773	3003	3200	3343	3439	3484
20	670	822	976	1130	1261	1412	1600	1881	2209	2574	3003	3424	3799	4020	4175	4282	4384	4450	4477
25	597	784	991	1216	1444	1703	2005	2408	2844	3290	3725	4126	4469	4691	4840	4924	4928	4899	4860
30	541	722	945	1209	1507	1853	2255	2804	3359	3864	4195	4415	4517	4425	4262	4076	3980	3914	3883
35	509	728	964	1217	1437	1710	2072	2777	3481	4057	4092	3960	3751	3666	3595	3540	3518	3511	3512
40	438	676	936	1218	1495	1813	2194	2836	3447	3912	3816	3575	3300	3308	3357	3409	3333	3250	3187
45	349	640	932	1225	1505	1796	2109	2553	2967	3288	3299	3209	3077	3032	2998	2970	2941	2921	2913
50	276	534	811	1104	1434	1766	2086	2390	2645	2826	2829	2774	2700	2704	2722	2745	2761	2775	2785
55	222	393	619	901	1303	1712	2081	2275	2399	2474	2530	2564	2589	2630	2669	2705	2735	2758	2771
60	180	304	504	780	1220	1670	2063	2186	2231	2241	2325	2412	2498	2568	2630	2683	2733	2769	2790
65	145	236	404	647	1043	1457	1832	1994	2092	2157	2267	2374	2476	2574	2661	2732	2775	2798	2804
70	113	167	291	485	799	1145	1485	1723	1923	2091	2229	2346	2450	2563	2663	2745	2790	2813	2817
75	74.9	108	203	359	602	887	1193	1500	1790	2042	2188	2294	2377	2483	2578	2654	2695	2715	2718
80	42.0	67.1	149	286	501	757	1037	1344	1632	1870	1957	1990	1994	2027	2055	2077	2087	2093	2095
85	24.5	50.0	113	213	376	558	738	882	998	1077	1075	1046	1007	1006	1010	1017	1019	1021	1024
90	12.5	30.7	59.5	99.0	158	221	281	325	359	382	383	379	373	383	395	407	413	416	418
95	9.19	18.9	33.7	53.6	81.5	112	144	173	199	219	225	226	226	236	246	256	260	262	262
100	8.78	16.5	26.6	38.9	54.6	71.7	89.7	108	125	141	153	163	173	186	198	208	213	216	216
105	8.03	15.2	23.1	31.5	40.9	50.6	60.5	70.3	79.8	88.8	95.5	102	110	122	134	145	150	153	154
110	6.68	11.3	16.7	23.0	30.7	38.8	47.0	54.5	61.5	67.8	72.5	76.5	80.4	85.5	90.3	94.3	96.1	96.9	97.2
115	5.86	10.1	14.8	19.9	25.6	31.8	38.3	45.8	53.1	59.7	63.4	66.2	68.8	72.8	76.6	79.6	80.2	80.0	79.5
120	5.06	8.99	13.0	17.2	20.9	25.2	30.4	39.2	48.1	55.8	57.8	58.4	58.7	61.9	65.4	68.4	69.3	69.5	69.3
125	4.39	7.36	10.5	13.9	17.1	20.9	25.3	32.4	39.7	46.5	50.4	53.4	55.5	57.5	59.0	60.0	60.2	60.1	59.9
130	3.94	5.40	7.51	10.3	13.8	17.9	22.5	27.9	33.6	39.4	45.6	51.2	55.7	57.4	57.9	57.7	57.5	57.1	56.7
135	3.51	3.84	5.16	7.46	11.2	15.6	20.2	23.9	27.6	31.5	35.8	40.5	45.2	50.8	55.9	59.8	60.2	59.5	58.4
140	3.05	2.75	3.53	5.38	9.17	13.4	17.4	19.3	20.7	22.1	24.8	27.8	31.0	34.3	37.7	40.8	43.9	46.3	47.8
145	2.69	1.70	1.81	3.03	6.21	9.85	13.3	14.4	15.2	16.0	18.4	20.9	23.4	24.7	25.8	26.6	27.7	28.5	29.1
150	2.35	1.68	1.67	2.33	4.04	6.12	8.28	9.62	10.9	12.3	14.6	16.8	18.8	19.7	20.1	20.4	21.2	22.0	22.5
155	2.05	1.71	1.67	1.95	2.57	3.48	4.63	6.02	7.58	9.29	11.4	13.4	15.0	15.1	14.9	14.6	14.8	15.0	15.3
160	1.79	1.73	1.69	1.67	1.47	1.44	1.72	2.89	4.35	5.92	7.29	8.50	9.47	9.86	10.0	10.0	10.0	10.0	10.0
165	1.53	1.52	1.49	1.45	1.35	1.26	1.25	1.34	1.56	1.94	2.66	3.46	4.24	4.75	5.16	5.47	5.67	5.80	5.87
170	1.43	1.41	1.38	1.34	1.30	1.25	1.21	1.16	1.11	1.06	1.02	0.98	0.95	0.93	0.91	0.92	1.00	1.08	1.16
175	1.51	1.49	1.48	1.46	1.44	1.41	1.38	1.35	1.32	1.28	1.25	1.21	1.18	1.15	1.13	1.11	1.09	1.08	1.10
180	1.63	1.62	1.62	1.61	1.59	1.57	1.55	1.53	1.50	1.47	1.44	1.41	1.38	1.35	1.33	1.32	1.32	1.33	1.34

UNIT: cd																			
C (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	694	694	694	693	692	691	691	691	691	691	691	690	690	690	689	689	689	689	693
5	963	953	940	923	902	879	855	830	804	774	746	722	704	692	686	685	690	700	647
10	1691	1653	1604	1552	1496	1439	1393	1344	1289	1215	1132	1043	936	834	750	706	691	702	505
15	3439	3343	3200	3003	2773	2521	2249	1983	1742	1589	1462	1346	1190	1038	902	806	737	693	451
20	4450	4384	4282	4175	4020	3799	3424	3003	2574	2209	1881	1600	1412	1261	1130	976	822	670	415
25	4899	4928	4924	4840	4691	4469	4126	3725	3290	2844	2408	2005	1703	1444	1216	991	784	597	376
30	3914	3980	4076	4262	4425	4517	4415	4195	3864	3359	2804	2255	1853	1507	1209	945	722	541	394
35	3511	3518	3540	3595	3666	3751	3960	4092	4057	3481	2777	2072	1710	1437	1217	964	728	509	420
40	3250	3333	3409	3357	3308	3300	3575	3816	3912	3447	2836	2194	1813	1495	1218	936	676	438	401
45	2921	2941	2970	2998	3032	3077	3209	3299	3288	2967	2553	2109	1796	1505	1225	932	640	349	356
50	2775	2761	2745	2722	2704	2700	2774	2829	2826	2645	2390	2086	1766	1434	1104	811	534	276	280
55	2758	2735	2705	2669	2630	2589	2564	2530	2474	2399	2275	2081	1712	1303	901	619	393	222	227
60	2769	2733	2683	2630	2568	2498	2412	2325	2241	2231	2186	2063	1670	1220	780	504	304	180	187
65	2798	2775	2732	2661	2574	2476	2374	2267	2157	2092	1994	1832	1457	1043	647	404	236	145	148
70	2813	2790	2745	2663	2563	2450	2346	2229	2091	1923	1723	1485	1145	799	485	291	167	113	106
75	2715	2695	2654	2578	2483	2377	2294	2188	2042	1790	1500	1193	887	602	359	203	108	74.9	66.8
80	2093	2087	2077	2055	2027	1994	1990	1957	1870	1632	1344	1037	757	501	286	149	67.1	42.0	39.4
85	1021	1019	1017	1010	1006	1007	1046	1075	1077	998	882	738	558	376	213	113	50.0	24.5	26.2
90	416	413	407	395	383	373	379	383	382	359	325	281	221	158	99.0	59.5	30.7	12.5	13.4
95	262	260	256	246	236	226	226	225	219	199	173	144	112	81.5	53.6	33.7	18.9	9.19	9.68
100	216	213	208	198	186	173	163	153	141	125	108	89.7	71.7	54.6	38.9	26.6	16.5	8.78	8.42
105	153	150	145	134	122	110	102	95.5	88.8	79.8	70.3	60.5	50.6	40.9	31.5	23.1	15.2	8.03	7.59
110	96.9	96.1	94.3	90.3	85.5	80.4	76.5	72.5	67.8	61.5	54.5	47.0	38.8	30.7	23.0	16.7	11.3	6.68	6.59
115	80.0	80.2	79.6	76.6	72.8	68.8	66.2	63.4	59.7	53.1	45.8	38.3	31.8	25.6	19.9	14.8	10.1	5.86	6.01
120	69.5	69.3	68.4	65.4	61.9	58.7	58.4	57.8	55.8	48.1	39.2	30.4	25.2	20.9	17.2	13.0	8.99	5.06	5.84
125	60.1	60.2	60.0	59.0	57.5	55.5	53.4	50.4	46.5	39.7	32.4	25.3	20.9	17.1	13.9	10.5	7.36	4.39	5.25
130	57.1	57.5	57.7	57.9	57.4	55.7	51.2	45.6	39.4	33.6	27.9	22.5	17.9	13.8	10.3	7.51	5.40	3.94	4.12
135	59.5	60.2	59.8	55.9	50.8	45.2	40.5	35.8	31.5	27.6	23.9	20.2	15.6	11.2	7.46	5.16	3.84	3.51	3.74
140	46.3	43.9	40.8	37.7	34.3	31.0	27.8	24.4	22.1	20.7	19.3	17.4	13.4	9.17	5.38	3.53	2.75	3.05	3.28
145	28.5	27.7	26.6	25.8	24.7	23.4	20.9	18.4	16.0	15.2	14.4	13.3	9.85	6.21	3.03	1.81	1.70	2.69	2.97
150	22.0	21.2	20.4	20.1	19.7	18.8	16.8	14.6	12.3	10.9	9.62	8.28	6.12	4.04	2.33	1.67	1.68	2.35	2.68
155	15.0	14.8	14.6	14.9	15.1	15.0	13.4	11.4	9.29	7.58	6.02	4.63	3.48	2.07	1.35	1.67	1.71	2.05	2.39
160	10.0	10.0	10.0	10.0	9.86	9.47	8.50	7.29	5.92	4.35	2.89	1.72	1.44	1.47	1.67	1.69	1.73	1.79	2.13
165	5.80	5.67	5.47	5.16	4.75	4.24	3.46	2.66	1.94	1.56	1.34	1.25	1.26	1.35	1.45	1.49	1.52	1.53	1.85
170	1.08	1.00	0.92	0.91	0.93	0.95	0.98	1.02	1.06	1.11	1.16	1.21	1.25	1.30	1.34	1.38	1.41	1.43	1.67
175	1.08	1.09	1.11	1.13	1.15	1.18	1.21	1.25	1.28	1.32	1.35	1.38	1.41	1.44	1.46	1.48	1.49	1.51	1.65
180	1.33	1.32	1.32	1.33	1.35	1.38	1.41	1.44	1.47	1.50	1.53	1.55	1.57	1.59	1.61	1.62	1.62	1.63	1.61

Table--3

UNIT: °C

C (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
γ	0	695	697	698	698	697	697	697	696	696	696	695	695	694	694	694	694	694	694
5	586	515	424	334	254	211	185	169	158	153	151	148	146	145	144	144	143	144	144
10	349	236	178	152	147	142	148	163	192	223	253	265	273	280	296	311	321	311	296
15	274	161	133	154	207	269	337	400	427	441	449	460	466	466	450	433	419	433	450
20	242	149	177	255	353	410	450	467	424	365	304	280	266	258	250	246	245	246	250
25	233	167	232	333	431	407	357	299	278	262	249	226	205	188	183	183	185	183	183
30	294	238	257	300	345	333	307	273	241	210	181	160	145	134	128	126	127	126	128
35	353	309	302	306	310	283	249	213	180	151	128	121	119	120	115	111	108	111	115
40	367	335	310	285	260	226	191	157	131	108	88.3	71.8	58.9	49.8	46.4	45.8	46.8	45.8	46.4
45	350	333	296	252	207	174	145	118	90.4	66.3	46.8	36.6	30.7	27.9	25.0	23.5	23.3	23.5	25.0
50	276	262	234	200	163	128	94.9	66.1	47.2	33.3	23.6	16.9	12.8	10.6	8.99	8.38	8.53	8.38	8.99
55	223	211	184	152	118	87.5	60.0	37.1	24.8	17.4	13.2	9.10	6.40	4.83	4.05	3.90	4.16	3.90	4.05
60	184	172	146	114	82.7	60.1	41.3	26.7	18.0	12.6	9.33	6.08	3.86	2.49	1.89	1.80	2.01	1.80	1.89
65	144	132	106	77.5	50.2	36.0	26.3	19.7	14.2	10.2	7.36	4.55	2.40	0.94	0.45	0.44	0.70	0.44	0.45
70	96.5	84.9	68.6	51.8	36.3	26.8	19.8	14.8	10.9	8.02	5.91	3.65	1.85	0.58	0.25	0.31	0.57	0.31	0.25
75	58.8	50.7	42.2	34.0	26.5	20.8	16.1	12.4	9.50	7.26	5.46	3.58	2.05	0.94	0.66	0.72	0.94	0.72	0.66
80	36.4	33.1	29.2	25.2	21.2	17.5	14.1	11.1	8.70	6.65	4.94	3.41	2.21	1.37	1.16	1.21	1.38	1.21	1.16
85	26.8	26.1	23.6	20.3	16.8	14.2	11.9	9.73	7.75	6.01	4.51	3.31	2.39	1.77	1.61	1.66	1.80	1.66	1.61
90	13.9	13.8	12.9	11.8	10.5	9.49	8.50	7.46	6.11	4.78	3.60	2.90	2.42	2.14	2.07	2.10	2.18	2.10	2.07
95	9.81	9.58	8.78	7.76	6.70	5.97	5.31	4.69	3.98	3.33	2.80	2.55	2.43	2.39	2.38	2.41	2.44	2.41	2.38
100	7.99	7.50	6.91	6.29	5.66	5.12	4.60	4.11	3.60	3.14	2.78	2.63	2.57	2.57	2.58	2.60	2.62	2.60	2.58
105	7.12	6.63	6.06	5.50	4.98	4.58	4.22	3.89	3.50	3.15	2.86	2.74	2.70	2.70	2.71	2.73	2.74	2.73	2.71
110	6.39	6.09	5.62	5.09	4.59	4.27	4.00	3.75	3.42	3.11	2.85	2.74	2.70	2.69	2.69	2.71	2.72	2.71	2.69
115	6.01	5.84	5.40	4.88	4.37	4.09	3.86	3.66	3.36	3.07	2.83	2.73	2.69	2.68	2.67	2.68	2.69	2.68	2.67
120	6.24	6.27	5.69	4.91	4.13	3.84	3.65	3.52	3.27	3.02	2.82	2.73	2.69	2.68	2.67	2.67	2.67	2.67	2.67
125	5.74	5.86	5.39	4.71	4.01	3.74	3.57	3.44	3.24	3.05	2.90	2.84	2.82	2.82	2.81	2.80	2.80	2.80	2.81
130	4.23	4.26	4.19	4.07	3.91	3.73	3.55	3.36	3.20	3.06	2.96	2.95	2.97	2.99	3.00	3.00	2.99	3.00	3.00
135	3.88	3.93	3.87	3.74	3.58	3.45	3.33	3.21	3.09	3.00	2.94	2.96	3.00	3.05	3.08	3.09	3.09	3.09	3.08
140	3.44	3.53	3.52	3.46	3.35	3.23	3.11	2.99	2.92	2.87	2.85	2.89	2.95	3.01	3.05	3.07	3.07	3.07	3.05
145	3.16	3.26	3.23	3.14	3.02	2.92	2.84	2.77	2.73	2.72	2.74	2.79	2.85	2.91	2.95	2.97	2.97	2.97	2.95
150	2.90	3.02	2.99	2.89	2.77	2.70	2.64	2.60	2.59	2.60	2.63	2.67	2.71	2.74	2.77	2.79	2.78	2.79	2.77
155	2.63	2.77	2.75	2.66	2.55	2.51	2.47	2.45	2.44	2.43	2.43	2.46	2.48	2.50	2.48	2.44	2.39	2.44	2.48
160	2.37	2.52	2.52	2.47	2.39	2.39	2.39	2.39	2.39	2.35	2.31	2.27	2.25	2.24	2.22	2.17	2.11	2.05	2.11
165	2.09	2.24	2.28	2.26	2.21	2.21	2.19	2.17	2.11	2.05	1.99	1.92	1.85	1.78	1.73	1.69	1.65	1.69	1.73
170	1.85	1.96	1.99	1.97	1.92	1.87	1.82	1.75	1.65	1.55	1.45	1.36	1.28	1.23	1.21	1.21	1.22	1.21	1.21
175	1.76	1.82	1.85	1.84	1.80	1.73	1.64	1.55	1.48	1.42	1.36	1.31	1.27	1.24	1.23	1.24	1.26	1.24	1.23
180	1.60	1.59	1.59	1.60	1.60	1.59	1.58	1.55	1.51	1.46	1.42	1.38	1.35	1.32	1.31	1.31	1.32	1.31	1.31

C (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
γ	0	694	695	695	696	696	696	696	697	697	697	698	698	697	695	693			
5	145	146	148	151	153	158	169	185	211	254	334	424	515	586	647				
10	280	273	265	253	223	192	163	148	142	147	152	178	236	349	505				
15	466	466	460	449	441	427	400	337	269	207	154	133	161	274	451				
20	258	266	280	304	365	424	467	450	410	353	255	177	149	242	415				
25	188	205	226	249	262	278	299	357	407	431	333	232	167	233	376				
30	134	145	160	181	210	241	273	307	333	345	300	257	238	294	394				
35	120	119	121	128	151	180	213	249	283	310	306	302	309	353	420				
40	49.8	58.9	71.8	88.3	108	131	157	191	226	260	285	310	335	367	401				
45	27.9	30.7	36.6	46.8	66.3	90.4	118	145	174	207	252	296	333	350	356				
50	10.6	12.8	16.9	23.6	33.3	47.2	66.1	94.9	128	163	200	234	262	276	280				
55	4.83	6.40	9.10	13.2	17.4	24.8	37.1	60.0	87.5	118	152	184	211	223	227				
60	2.49	3.86	6.08	9.33	12.6	18.0	26.7	41.3	60.1	82.7	114	146	172	184	187				
65	0.94	2.40	4.55	7.36	10.2	14.2	19.7	26.3	36.0	50.2	77.5	106	132	144	148				
70	0.58	1.85	3.65	5.91	8.02	10.9	14.8	19.8	26.8	36.3	51.8	68.6	84.9	96.5	106				
75	0.94	2.05	3.58	5.46	7.26	9.50	12.4	16.1	20.8	26.5	34.0	42.2	50.7	58.8	66.8				
80	1.37	2.21	3.41	4.94	6.65	8.70	11.1	14.1	17.5	21.2	25.2	29.2	33.1	36.4	39.4				
85	1.77	2.39	3.31	4.51	6.01	7.75	9.73	11.9	14.2	16.8	20.3	23.6	26.1	26.8	26.2				
90	2.14	2.42	2.90	3.60	4.78	6.11	7.46	8.50	9.49	10.5	11.8	12.9	13.8	13.9	13.4				
95	2.39	2.43	2.55	2.80	3.33	3.98	4.69	5.31	5.97	6.70	7.76	8.78	9.58	9.81	9.68				
100	2.57	2.57	2.63	2.78	3.14	3.60	4.11	4.60	5.12	5.66	6.29	6.91	7.50	7.99	8.42				
105	2.70	2.70	2.74	2.86	3.15	3.50	3.89	4.22	4.58	4.98	5.50	6.06	6.63	7.12	7.59				
110	2.69	2.70	2.74	2.85	3.11	3.42	3.75	4.00	4.27	4.59	5.09	5.62	6.09	6.39	6.59				
115	2.68	2.69	2.73	2.83	3.07	3.36	3.66	3.86	4.09	4.37	4.88	5.40	5.84	6.01	6.01				
120	2.68	2.69	2.73	2.82	3.02	3.27	3.52	3.65	3.84	4.13	4.91	5.69	6.27	6.24	5.84				
125	2.82	2.82	2.84	2.90	3.05	3.24	3.44	3.57	3.74	4.01	4.71	5.39	5.86	5.74	5.25				
130	2.99	2.97	2.95	2.96	3.06	3.20	3.36	3.55	3.73	3.91	4.07	4.19	4.26	4.23	4.12				
135	3.05	3.00	2.96	2.94	3.00	3.09	3.21	3.33	3.45	3.58	3.74	3.87	3.93	3.88	3.74				
140	3.01	2.95	2.89	2.85	2.87	2.92	2.99	3.11	3.23	3.35	3.46	3.52	3.53	3.44	3.28				
145	2.91	2.85	2.79	2.74	2.72	2.73	2.77	2.84	2.92	3.02	3.14	3.23	3.26	3.16	2.97				
150	2.74	2.71	2.67	2.63	2.60	2.59	2.60	2.64	2.70	2.77	2.89	2.99	3.02	2.90	2.68				
155	2.50	2.48	2.46	2.43	2.43	2.44	2.45	2.47	2.51	2.55	2.66	2.75	2.77	2.63	2.39				
160	2.22	2.24	2.25	2.27	2.31	2.35	2.39	2.39	2.39	2.39	2.47	2.52	2.52	2.37	2.13				
165	1.78	1.85	1.92	1.99	2.05	2.11	2.17	2.19	2.21	2.21	2.26	2.28	2.24	2.09	1.85				
170	1.23	1.28	1.36	1.45	1.55	1.65	1.75	1.82	1.87	1.92	1.97	1.99	1.96	1.85	1.67				
175	1.24	1.27	1.31	1.36	1.42	1.48	1.55	1.64	1.73	1.80	1.84	1.85	1.82	1.76	1.65				
180	1.32	1.35	1.38	1.42	1.46	1.51	1.55	1.58	1.59	1.60	1.60	1.59	1.59	1.60	1.61				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34M @ 40W / 4000K	Sample ID	230612002-S1
Temperature (°C)	25.4	Humidity (%RH)	41.0

Test Method
<p>The samples were tested according to the ANSI C82.77:2014</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	0.347	41.3	0.991	2.78
277.0	60	0.178	41.6	0.844	13.12

5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2022-11-09	2023-11-08
NTC-F01-006	2.0 meter Integrating Sphere	2022-11-09	2023-11-08
NTC-F01-012	Standard Lamp	2022-11-09	2023-11-08
NTC-F01-013	Standard Lamp	2022-11-09	2023-11-08
NTC-F01-031	Digital Power Meter	2022-08-31	2023-08-30
NTC-F01-019	Temperature & Humidity Meter	2022-11-12	2023-11-11

*****End of Report*****