

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

Dongguan New Testing Centre Co., Ltd.

Prepare by:

Alan Wang

Engineer: Alan Wang

Date: 2023-06-13

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

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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		11892
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		164.5
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		11454
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	158.4
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		72.3
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	4.23
			277V	17.67
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.990
			277V	0.837
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5023
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		74.6
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-28
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		75
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%		-17%
Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≤10%		7.6%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		120.0
(Goniophotometer – Section 4.2)		Non-Worst Case		277.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.609
(Goniophotometer – Section 4.2)		Non-Worst Case		0.309
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		72.3
(Goniophotometer – Section 4.2)		Non-Worst Case		71.6

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-12	W34L @ 75W / 5000K	230612001-S1
2	Goniophotometer Test	2023-06-12	W34L @ 75W / 5000K	230612001-S1
3	THD and PF Test	2023-06-12	W34L @ 75W / 5000K	230612001-S1

Remark (If any)

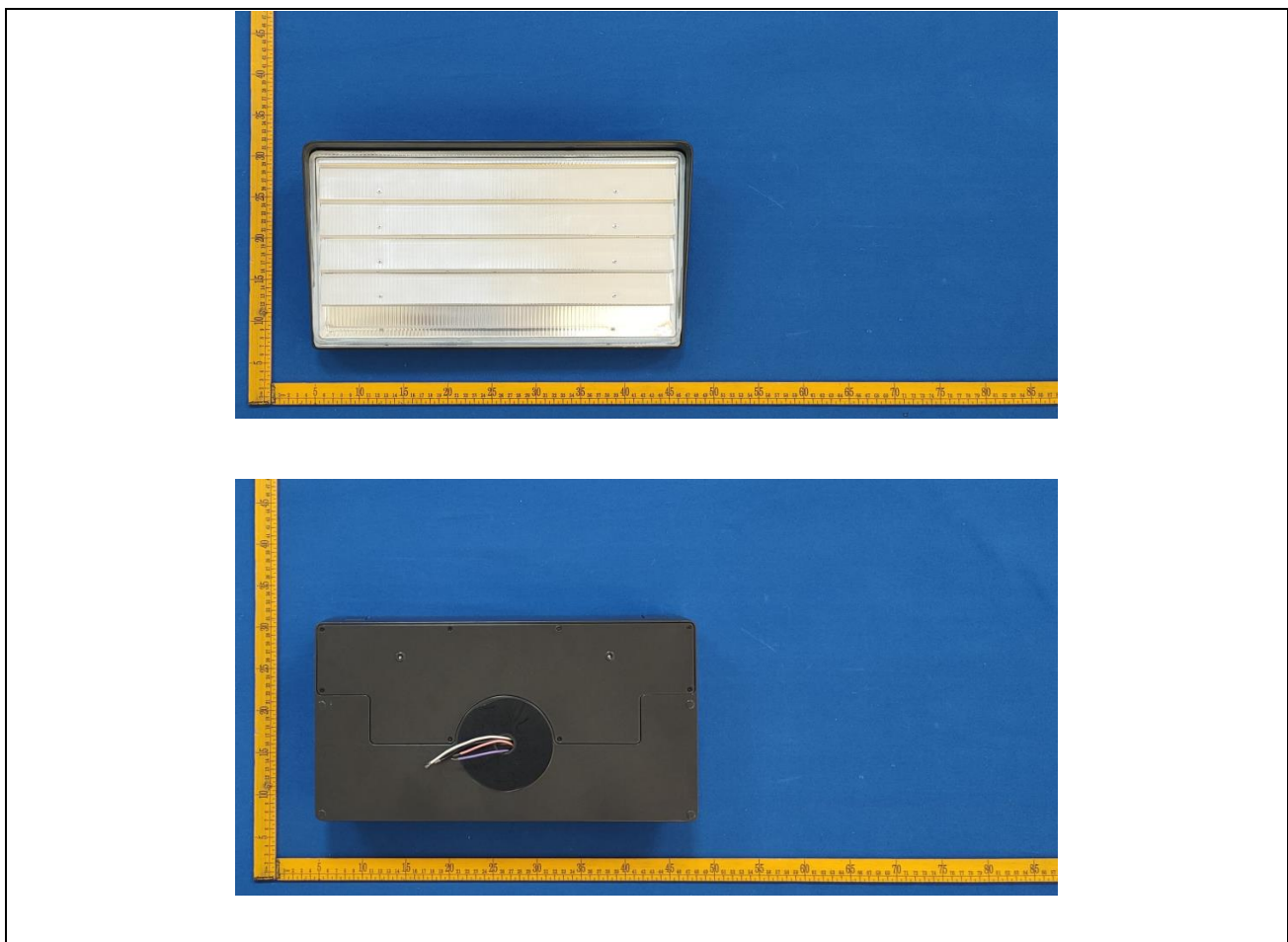
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

3.0 Product Description

Luminaire Description: Model No. W34L @ 75W / 5000K, 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.	W34L @ 75W / 5000K	Sample ID	230612001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

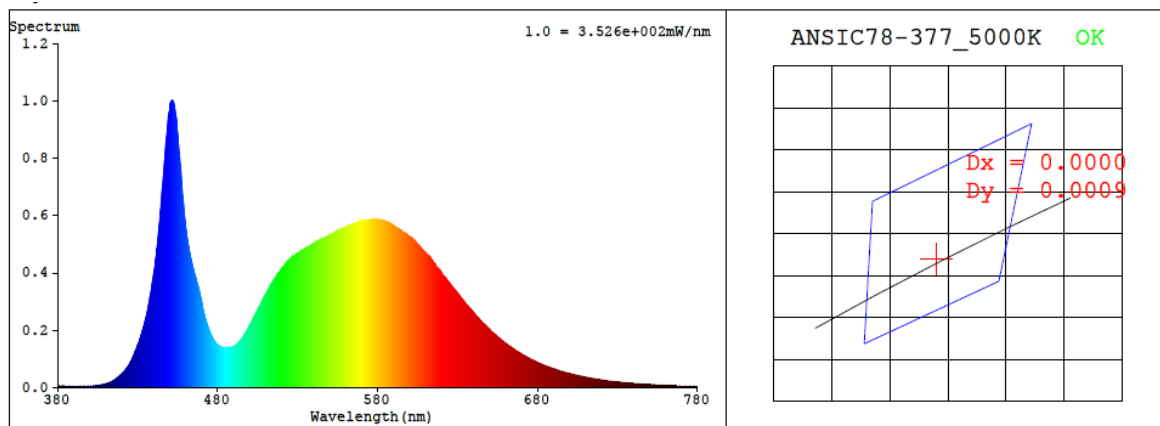
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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.</p> <p>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	0.609	72.3	0.990
277.0	60	0.309	71.6	0.837

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5023	74.6	-28	0.0004	75	94	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3445$ $y = 0.3520$ / $u' = 0.2109$ $v' = 0.4848$ ($duv=4.45e-04$)

CCT= 5023K Prcp WL: $L_d=571.9\text{nm}$ Purity=9.0%

Peak WL: $L_p=452\text{nm}$ FWHM: $=19.3\text{nm}$ Ratio: $R=14.6\%$ $G=81.7\%$ $B=3.7\%$

Render Index: $R_a = 74.6$ $\text{AvgR} = 64.9$ $\text{TM30:Rf}=75$ $R_g=93$

EEL: 0.08317 A++ Highest

$R_1=72$ $R_2=81$ $R_3=87$ $R_4=74$ $R_5=73$ $R_6=73$ $R_7=82$

$R_8=56$ $R_9=-28$ $R_{10}=54$ $R_{11}=70$ $R_{12}=47$ $R_{13}=74$ $R_{14}=92$ $R_{15}=66$

4.1 Integrating Sphere Test

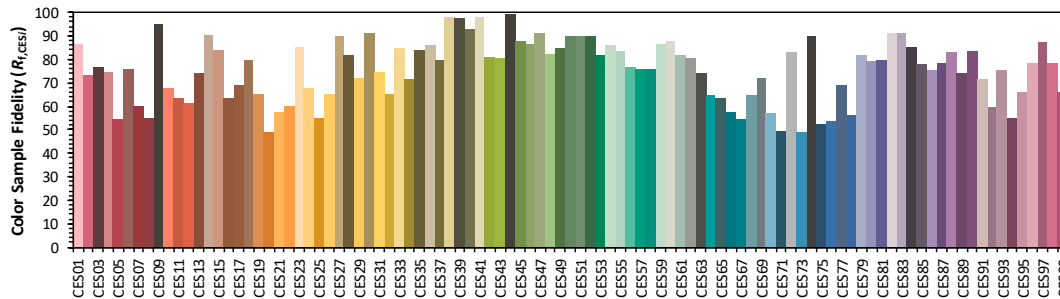
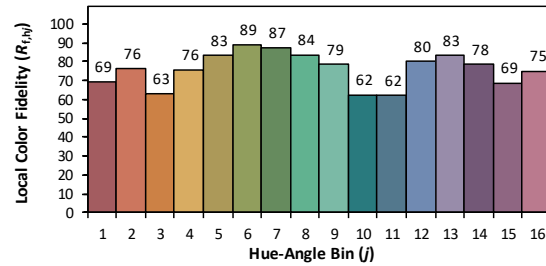
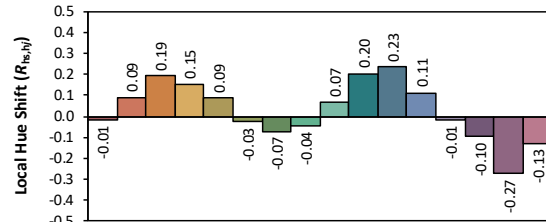
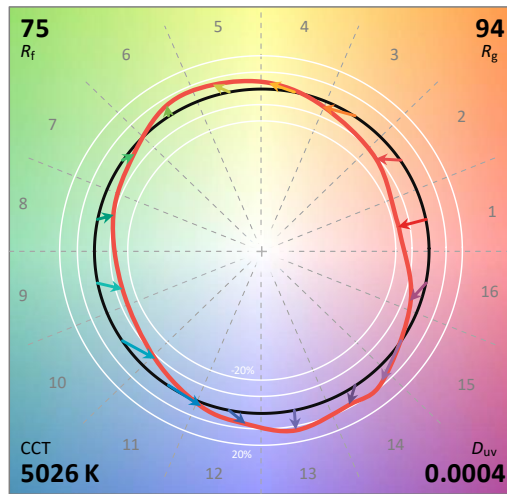
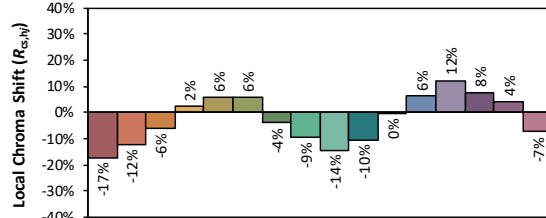
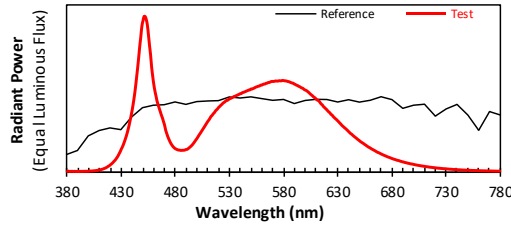
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/13

Model: W34L @ 75W / 5000K



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

x 0.3445
 y 0.3519
 u' 0.2109
 v' 0.4847

CIE 13.3-1995
(CRI)

R_a 75
 R_g -28

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	3.00E-06	447	8.05E-04	514	3.63E-04	581	5.85E-04	648	2.13E-04	715	3.06E-05
381	4.90E-06	448	8.68E-04	515	3.73E-04	582	5.84E-04	649	2.07E-04	716	2.97E-05
382	2.60E-06	449	9.36E-04	516	3.80E-04	583	5.83E-04	650	2.02E-04	717	2.90E-05
383	3.20E-06	450	9.70E-04	517	3.91E-04	584	5.80E-04	651	1.96E-04	718	2.81E-05
384	3.60E-06	451	9.97E-04	518	3.98E-04	585	5.79E-04	652	1.91E-04	719	2.73E-05
385	3.50E-06	452	9.97E-04	519	4.04E-04	586	5.76E-04	653	1.86E-04	720	2.65E-05
386	2.60E-06	453	9.79E-04	520	4.14E-04	587	5.73E-04	654	1.82E-04	721	2.56E-05
387	3.90E-06	454	9.45E-04	521	4.20E-04	588	5.70E-04	655	1.77E-04	722	2.48E-05
388	2.60E-06	455	8.84E-04	522	4.27E-04	589	5.69E-04	656	1.72E-04	723	2.40E-05
389	2.90E-06	456	8.15E-04	523	4.33E-04	590	5.64E-04	657	1.67E-04	724	2.35E-05
390	2.70E-06	457	7.53E-04	524	4.41E-04	591	5.61E-04	658	1.62E-04	725	2.28E-05
391	3.00E-06	458	6.74E-04	525	4.46E-04	592	5.56E-04	659	1.58E-04	726	2.20E-05
392	3.40E-06	459	6.14E-04	526	4.51E-04	593	5.54E-04	660	1.54E-04	727	2.13E-05
393	3.20E-06	460	5.62E-04	527	4.58E-04	594	5.49E-04	661	1.50E-04	728	2.08E-05
394	3.30E-06	461	5.21E-04	528	4.59E-04	595	5.47E-04	662	1.46E-04	729	2.01E-05
395	3.80E-06	462	4.89E-04	529	4.63E-04	596	5.42E-04	663	1.42E-04	730	1.95E-05
396	3.40E-06	463	4.55E-04	530	4.69E-04	597	5.38E-04	664	1.38E-04	731	1.89E-05
397	4.20E-06	464	4.32E-04	531	4.71E-04	598	5.36E-04	665	1.34E-04	732	1.85E-05
398	3.80E-06	465	4.09E-04	532	4.75E-04	599	5.30E-04	666	1.30E-04	733	1.78E-05
399	4.40E-06	466	3.87E-04	533	4.78E-04	600	5.26E-04	667	1.26E-04	734	1.73E-05
400	4.40E-06	467	3.65E-04	534	4.83E-04	601	5.23E-04	668	1.23E-04	735	1.69E-05
401	5.30E-06	468	3.46E-04	535	4.85E-04	602	5.18E-04	669	1.20E-04	736	1.62E-05
402	5.70E-06	469	3.23E-04	536	4.88E-04	603	5.12E-04	670	1.16E-04	737	1.58E-05
403	5.70E-06	470	3.00E-04	537	4.92E-04	604	5.05E-04	671	1.13E-04	738	1.54E-05
404	6.60E-06	471	2.68E-04	538	4.95E-04	605	4.99E-04	672	1.10E-04	739	1.48E-05
405	7.10E-06	472	2.47E-04	539	4.98E-04	606	4.93E-04	673	1.07E-04	740	1.46E-05
406	8.00E-06	473	2.26E-04	540	5.02E-04	607	4.87E-04	674	1.04E-04	741	1.41E-05
407	8.90E-06	474	2.09E-04	541	5.03E-04	608	4.80E-04	675	1.01E-04	742	1.35E-05
408	1.02E-05	475	1.94E-04	542	5.09E-04	609	4.76E-04	676	9.72E-05	743	1.33E-05
409	1.14E-05	476	1.81E-04	543	5.10E-04	610	4.69E-04	677	9.51E-05	744	1.29E-05
410	1.27E-05	477	1.70E-04	544	5.13E-04	611	4.62E-04	678	9.24E-05	745	1.23E-05
411	1.43E-05	478	1.61E-04	545	5.16E-04	612	4.59E-04	679	8.96E-05	746	1.19E-05
412	1.66E-05	479	1.54E-04	546	5.19E-04	613	4.54E-04	680	8.69E-05	747	1.18E-05
413	1.84E-05	480	1.48E-04	547	5.22E-04	614	4.44E-04	681	8.43E-05	748	1.16E-05
414	2.14E-05	481	1.46E-04	548	5.26E-04	615	4.35E-04	682	8.18E-05	749	1.09E-05
415	2.40E-05	482	1.42E-04	549	5.27E-04	616	4.29E-04	683	7.97E-05	750	1.07E-05
416	2.76E-05	483	1.40E-04	550	5.32E-04	617	4.19E-04	684	7.74E-05	751	1.04E-05
417	3.19E-05	484	1.39E-04	551	5.32E-04	618	4.13E-04	685	7.50E-05	752	1.03E-05
418	3.64E-05	485	1.38E-04	552	5.35E-04	619	4.06E-04	686	7.33E-05	753	9.70E-06
419	4.06E-05	486	1.38E-04	553	5.38E-04	620	4.00E-04	687	7.17E-05	754	9.50E-06
420	4.64E-05	487	1.39E-04	554	5.43E-04	621	3.91E-04	688	6.88E-05	755	9.20E-06
421	5.20E-05	488	1.39E-04	555	5.45E-04	622	3.85E-04	689	6.70E-05	756	9.00E-06
422	5.83E-05	489	1.41E-04	556	5.48E-04	623	3.78E-04	690	6.49E-05	757	8.80E-06
423	6.62E-05	490	1.44E-04	557	5.50E-04	624	3.69E-04	691	6.33E-05	758	8.50E-06
424	7.34E-05	491	1.45E-04	558	5.52E-04	625	3.64E-04	692	6.10E-05	759	8.40E-06
425	8.24E-05	492	1.50E-04	559	5.57E-04	626	3.55E-04	693	5.95E-05	760	8.00E-06
426	9.24E-05	493	1.56E-04	560	5.57E-04	627	3.48E-04	694	5.78E-05	761	7.70E-06
427	1.04E-04	494	1.62E-04	561	5.61E-04	628	3.42E-04	695	5.59E-05	762	7.50E-06
428	1.17E-04	495	1.69E-04	562	5.64E-04	629	3.36E-04	696	5.44E-05	763	7.10E-06
429	1.30E-04	496	1.77E-04	563	5.65E-04	630	3.29E-04	697	5.27E-05	764	7.00E-06
430	1.47E-04	497	1.86E-04	564	5.69E-04	631	3.22E-04	698	5.13E-05	765	6.90E-06
431	1.61E-04	498	1.96E-04	565	5.70E-04	632	3.14E-04	699	5.01E-05	766	6.60E-06
432	1.78E-04	499	2.06E-04	566	5.74E-04	633	3.07E-04	700	4.86E-05	767	6.40E-06
433	1.97E-04	500	2.15E-04	567	5.74E-04	634	2.99E-04	701	4.69E-05	768	6.30E-06
434	2.18E-04	501	2.26E-04	568	5.78E-04	635	2.93E-04	702	4.54E-05	769	6.10E-06
435	2.40E-04	502	2.38E-04	569	5.80E-04	636	2.86E-04	703	4.41E-05	770	5.90E-06
436	2.66E-04	503	2.48E-04	570	5.80E-04	637	2.80E-04	704	4.29E-05	771	5.70E-06
437	2.94E-04	504	2.59E-04	571	5.80E-04	638	2.75E-04	705	4.15E-05	772	5.70E-06
438	3.26E-04	505	2.70E-04	572	5.82E-04	639	2.67E-04	706	4.05E-05	773	5.30E-06
439	3.60E-04	506	2.80E-04	573	5.84E-04	640	2.61E-04	707	3.91E-05	774	5.20E-06
440	3.96E-04	507	2.91E-04	574	5.83E-04	641	2.54E-04	708	3.83E-05	775	5.20E-06
441	4.39E-04	508	3.02E-04	575	5.83E-04	642	2.47E-04	709	3.67E-05	776	5.00E-06
442	4.85E-04	509	3.13E-04	576	5.85E-04	643	2.42E-04	710	3.60E-05	777	4.70E-06
443	5.39E-04	510	3.24E-04	577	5.85E-04	644	2.36E-04	711	3.49E-05	778	4.60E-06
444	6.00E-04	511	3.33E-04	578	5.84E-04	645	2.29E-04	712	3.36E-05	779	4.70E-06
445	6.63E-04	512	3.44E-04	579	5.87E-04	646	2.24E-04	713	3.28E-05	780	4.70E-06
446	7.31E-04	513	3.56E-04	580	5.86E-04	647	2.18E-04	714	3.18E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34L @ 75W / 5000K	Sample ID	230612001-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	120.0	60	0.609	72.3	0.990
NON-WORST CASE	277.0	60	0.309	71.6	0.837

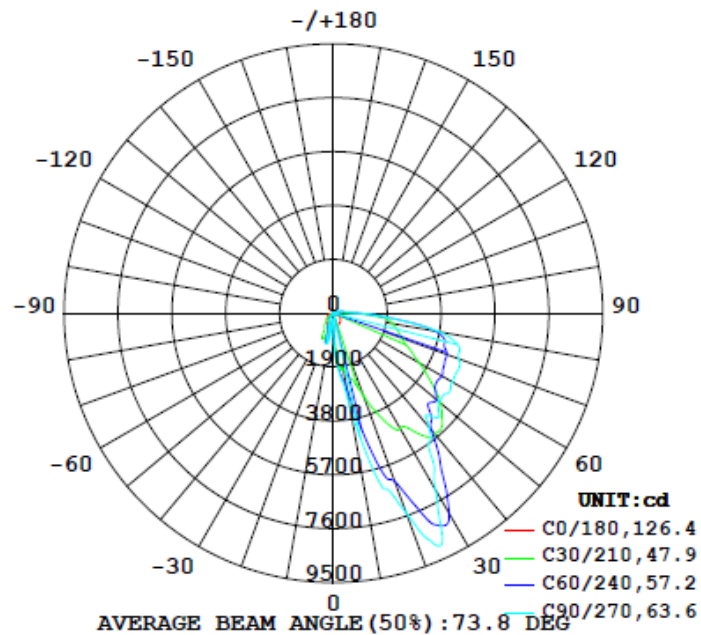
Test Result

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	11892	4.4	134.5	63.3	84.0	164.5	7.3%	B1-U3-G5
0°-90° zones	11454	4.4	134.5	63.3	84.0	158.4	7.6%	B1-U3-G5

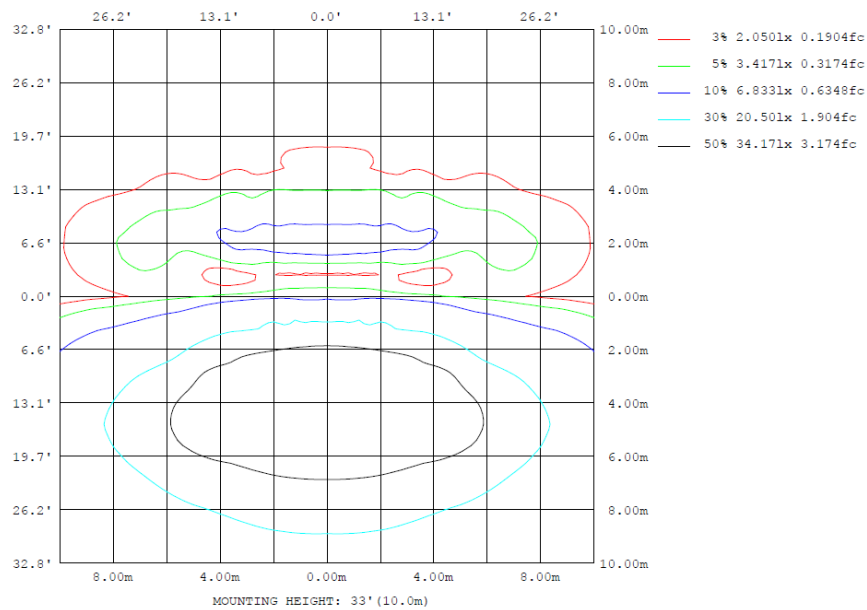
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

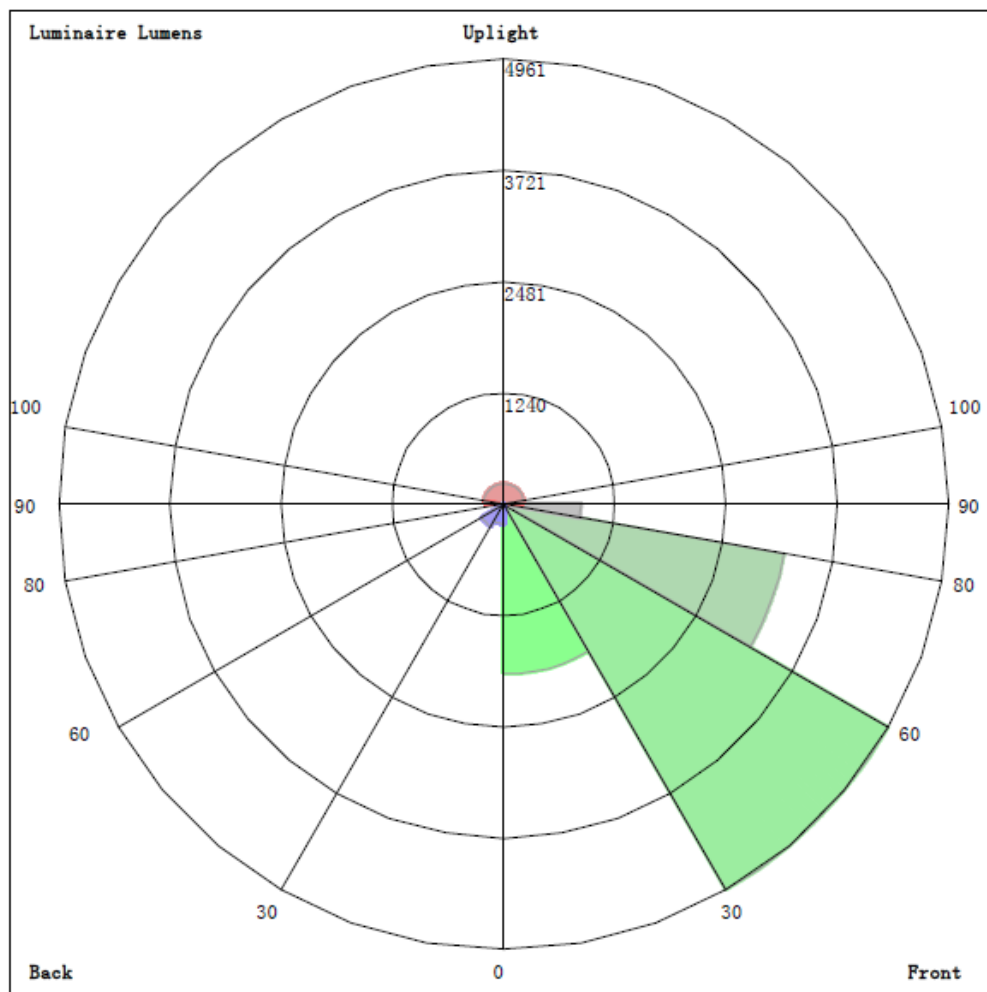
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	φ zone	φ total	lum, lamp
10	446.7	2366	3314	2366	446.7	338.7	922.5	338.7	0- 10	101.6	101.6	0.85,0.85
20	450.3	5274	7475	5274	450.3	904.9	531.0	904.9	10- 20	613.9	715.5	6.02,6.02
30	420.1	7576	7207	7576	420.1	396.5	296.6	396.5	20- 30	1394	2109	17.7,17.7
40	380.5	6453	5250	6453	380.5	298.2	93.16	298.2	30- 40	1745	3854	32.4,32.4
50	317.9	4418	4849	4418	317.9	117.4	15.93	117.4	40- 50	1762	5617	47.2,47.2
60	253.2	3900	4843	3900	253.2	39.26	3.819	39.26	50- 60	1737	7354	61.8,61.8
70	175.7	3656	4699	3656	175.7	18.61	1.098	18.61	60- 70	1682	9036	76,76
80	76.10	3245	3760	3245	76.10	14.48	2.515	14.48	70- 80	1550	10586	89,89
90	18.66	815.1	914.0	815.1	18.66	10.25	3.829	10.25	80- 90	867.7	11454	96.3,96.3
100	14.85	278.1	382.2	278.1	14.85	6.805	4.582	6.805	90-100	211.3	11665	98.1,98.1
110	11.01	124.7	177.8	124.7	11.01	6.227	4.738	6.227	100-110	96.70	11762	98.9,98.9
120	7.575	101.0	120.0	101.0	7.575	5.838	4.596	5.838	110-120	51.51	11813	99.3,99.3
130	5.825	62.95	117.5	62.95	5.825	5.680	5.124	5.680	120-130	35.96	11849	99.6,99.6
140	4.760	41.52	68.23	41.52	4.760	5.101	5.327	5.101	130-140	23.64	11873	99.8,99.8
150	3.748	27.59	44.64	27.59	3.748	4.437	4.888	4.437	140-150	11.74	11885	99.9,99.9
160	2.997	16.79	24.48	16.79	2.997	4.182	3.733	4.182	150-160	5.622	11890	100,100
170	2.563	1.894	5.550	1.894	2.563	3.298	2.182	3.298	160-170	1.798	11892	100,100
180	2.921	2.655	2.504	2.655	2.921	2.859	2.391	2.859	170-180	0.2402	11892	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	101.56	0-10	101.56	0.85%
10-20	613.95	0-20	715.51	6.02%
20-30	1393.95	0-30	2109.46	17.74%
30-40	1745.03	0-40	3854.49	32.41%
40-50	1762.27	0-50	5616.76	47.23%
50-60	1737.39	0-60	7354.15	61.84%
60-70	1682.25	0-70	9036.40	75.99%
70-80	1549.59	0-80	10585.99	89.02%
80-90	867.66	0-90	11453.65	96.31%
90-100	211.32	0-100	11664.97	98.09%
100-110	96.70	0-110	11761.67	98.90%
110-120	51.51	0-120	11813.18	99.34%
120-130	35.96	0-130	11849.14	99.64%
130-140	23.64	0-140	11872.78	99.84%
140-150	11.74	0-150	11884.52	99.94%
150-160	5.62	0-160	11890.14	99.98%
160-170	1.80	0-170	11891.94	100.00%
170-180	0.24	0-180	11892.18	100.00%

4.2 Goniophotometer Test

LCS/BUG

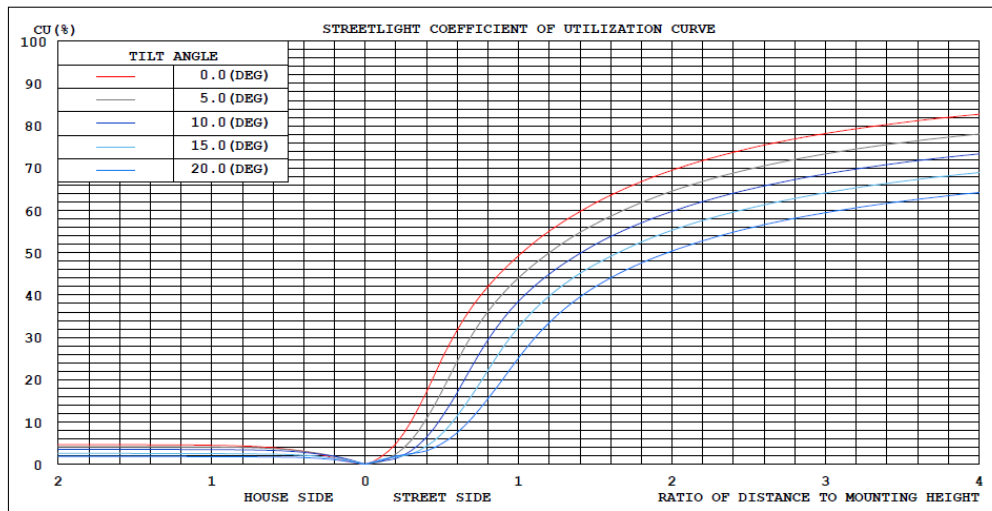


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

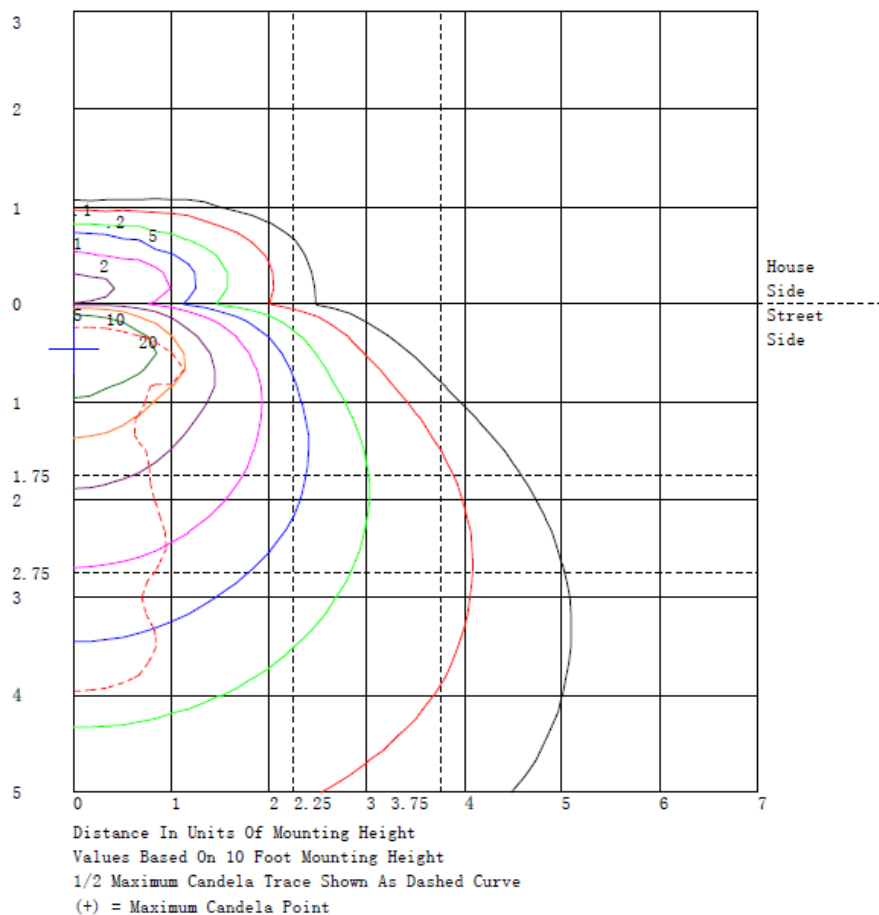
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1892.4	N.A.	15.9
FM - Front-Medium (30-60)	4961.2	N.A.	41.7
FH - Front-High (60-80)	3177.5	N.A.	26.7
FVH - Front-Very High (80-90)	858.9	N.A.	7.2
BL - Back-Low (0-30)	217.0	N.A.	1.8
BM - Back-Medium (30-60)	283.5	N.A.	2.4
BH - Back-High (60-80)	54.3	N.A.	0.5
BVH - Back-Very High (80-90)	8.7	N.A.	0.1
UL - Uplight-Low (90-100)	211.3	N.A.	1.8
UH - Uplight-High (100-180)	227.2	N.A.	1.9
Total	11892.0	N.A.	100.0
BUG Rating	B1-U3-G5		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG) y	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	447	448	449	450	451	453	454	456	457	459	461	464	466	468	470	471	472	473	474
5	445	531	664	844	1129	1419	1672	1751	1778	1784	1847	1908	1956	1961	1952	1939	1941	1945	1950
10	447	986	1413	1727	1872	1946	1991	2112	2239	2366	2467	2569	2681	2843	3005	3151	3241	3296	3314
15	450	1102	1623	2012	2176	2278	2388	2686	3048	3461	3938	4420	4877	5236	5534	5771	5944	6052	6092
20	450	1061	1604	2078	2395	2710	3089	3802	4559	5274	5693	6023	6301	6648	6962	7222	7372	7454	7475
25	438	988	1565	2168	2809	3468	4137	4793	5453	6119	6866	7569	8175	8524	8752	8888	8979	9018	9017
30	420	916	1500	2170	2949	3799	4703	5753	6742	7576	7977	8161	8165	7986	7729	7457	7319	7235	7207
35	405	955	1602	2345	3254	4210	5161	6123	6930	7482	7365	7028	6606	6426	6285	6173	6048	5956	5910
40	380	1025	1759	2580	3634	4668	5575	6094	6385	6453	6163	5768	5380	5320	5335	5380	5334	5286	5250
45	359	1027	1767	2577	3643	4641	5430	5536	5406	5151	4995	4854	4758	4809	4906	5022	5105	5169	5203
50	318	879	1522	2247	3246	4183	4914	4903	4689	4418	4489	4611	4743	4775	4787	4789	4815	4836	4849
55	279	894	1523	2166	2929	3627	4181	4297	4271	4186	4238	4310	4397	4504	4615	4721	4816	4888	4926
60	253	807	1356	1899	2492	3038	3493	3697	3816	3900	4079	4258	4424	4542	4638	4713	4779	4824	4843
65	212	671	1130	1587	2067	2527	2950	3284	3568	3807	4005	4172	4314	4451	4569	4667	4747	4802	4827
70	176	448	770	1142	1603	2085	2560	2969	3337	3656	3901	4100	4259	4396	4504	4586	4647	4685	4699
75	132	281	517	842	1313	1828	2345	2771	3148	3472	3709	3900	4058	4222	4362	4473	4541	4578	4587
80	76.1	174	369	659	1104	1601	2107	2542	2927	3245	3433	3557	3633	3697	3737	3758	3768	3768	3760
85	37.8	105	254	487	883	1302	1685	1869	1977	2030	2061	2066	2056	2051	2043	2033	2028	2023	2018
90	18.7	68.9	145	246	402	563	705	765	797	815	850	880	903	912	915	914	916	916	914
95	14.5	41.1	76.6	121	184	248	308	340	365	385	413	439	461	474	483	487	491	493	492
100	14.9	33.5	55.6	81.3	112	145	180	214	247	278	307	333	354	365	373	377	380	382	382
105	12.5	25.6	40.8	58.1	79.3	101	122	136	150	165	190	216	241	262	279	292	299	301	300
110	11.0	20.9	32.6	46.0	63.2	80.8	97.1	107	116	125	138	152	164	171	175	178	179	178	178
115	9.21	16.5	25.6	36.6	51.4	66.7	81.0	90.3	97.8	104	111	118	125	134	142	148	150	151	151
120	7.57	13.4	20.6	29.3	40.1	51.8	64.2	77.9	90.6	101	104	106	107	111	116	119	120	120	120
125	6.45	10.9	16.7	23.7	32.1	41.6	52.1	64.0	76.0	87.3	96.6	104	110	112	112	111	110	109	108
130	5.82	9.51	14.2	19.9	27.2	35.0	42.9	48.7	55.0	62.9	76.9	91.6	105	113	119	121	121	119	117
135	5.35	8.42	12.3	16.9	23.0	29.3	35.6	40.4	45.0	49.8	55.7	62.3	69.9	80.0	90.1	99.2	105	109	110
140	4.76	6.92	9.82	13.5	18.3	23.5	28.8	33.2	37.4	41.5	46.0	50.4	54.5	58.4	61.8	64.7	66.6	67.8	68.2
145	4.20	3.06	3.68	6.05	11.3	17.5	23.7	27.6	31.0	34.2	38.1	41.8	45.3	48.0	50.2	51.9	53.2	54.0	54.3
150	3.75	2.32	2.48	4.25	8.64	13.9	19.1	22.3	25.1	27.6	30.6	33.5	36.2	38.7	40.8	42.5	43.7	44.4	44.6
155	3.33	2.12	2.15	3.43	6.68	10.6	14.7	17.7	20.4	22.6	24.4	25.9	27.3	28.6	29.7	30.7	31.7	32.4	32.8
160	3.00	2.81	2.74	2.80	2.43	2.59	3.70	7.75	12.4	16.8	18.8	20.1	20.9	21.9	22.8	23.4	23.9	24.3	24.5
165	2.69	2.64	2.58	2.51	2.21	2.06	2.22	3.05	4.36	6.15	8.94	11.8	14.4	15.5	16.0	16.3	16.6	16.8	16.9
170	2.56	2.51	2.46	2.39	2.31	2.22	2.13	2.05	1.97	1.89	1.65	1.54	1.69	2.70	3.87	4.97	5.35	5.52	5.55
175	2.71	2.68	2.65	2.61	2.57	2.52	2.47	2.41	2.36	2.30	2.23	2.17	2.11	2.06	2.02	1.99	1.96	1.95	1.99
180	2.92	2.91	2.90	2.88	2.85	2.82	2.79	2.75	2.70	2.65	2.60	2.54	2.49	2.44	2.41	2.39	2.41	2.45	2.50

C (DEG)																			UNIT: cd	
y	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	
0	473	472	471	470	468	466	464	461	459	457	456	454	453	451	450	449	448	447	461	
5	1945	1941	1939	1952	1961	1956	1908	1847	1784	1778	1751	1672	1419	1129	844	664	531	445	420	
10	3296	3241	3151	3005	2843	2681	2569	2467	2366	2239	2112	1991	1946	1872	1727	1413	986	447	391	
15	6052	5944	5771	5534	5236	4877	4420	3938	3461	3048	2686	2388	2278	2176	2012	1623	1102	450	327	
20	7454	7372	7222	6962	6648	6301	6023	5693	5274	4559	3802	3089	2710	2395	2078	1604	1061	450	268	
25	9018	8979	8888	8752	8524	8175	7569	6866	6119	5453	4793	4137	3468	2809	2168	1565	988	438	303	
30	7235	7319	7457	7729	7986	8165	8161	7977	7576	6742	5753	4703	3799	2949	2170	1500	916	420	447	
35	5956	6048	6173	6285	6426	6606	7028	7365	7482	6930	6123	5161	4210	3254	2345	1602	955	405	562	
40	5286	5334	5380	5335	5320	5380	5768	6163	6453	6385	6094	5575	4668	3634	2580	1759	1025	380	573	
45	5169	5105	5022	4906	4809	4758	4854	4995	5151	5406	5536	5430	4641	3643	2577	1767	1027	359	500	
50	4836	4815	4789	4787	4775	4743	4611	4489	4418	4689	4903	4914	4183	3246	2247	1522	879	318	403	
55	4888	4816	4721	4615	4504	4397	4310	4238	4186	4271	4297	4181	3627	2929	2166	1523	894	279	341	
60	4824	4779	4713	4638	4542	4424	4258	4079	3900	3816	3697	3493	3038	2492	1899	1356	807	253	287	
65	4802	4747	4667	4569	4451	4314	4172	4005	3807	3568	3284	2950	2527	2067	1587	1130	671	212	225	
70	4685	4647	4586	4504	4396	4259	4100	3901	3656	3337	2969	2560	2085	1603	1142	770	448	176	171	
75	4578	4541	4473	4362	4222	4058	3900	3709	3472	3148	2771	2345	1828	1313	842	517	281	132	121	
80	3768	3768	3758	3737	3697	3633	3557	3433	3245	2927	2542	2107	1601	1104	659	369	174	76.1	66.1	
85	2023	2028	2033	2043	2051	2056	2066	2061	2030	1977	1869	1685	1302	883	487	254	105	37.8	36.9	
90	916	916	914	915	912	903	880	850	815	797	765	705	563	402	246	145	68.9	18.7	19.9	
95	493	491	487	483	474	461	439	413	385	365	340	308	248	184	121	76.6	41.1	14.5	15.1	
100	382	380	377	373	365	354	333	307	278	247	214	180	145	112	81.3	55.6	33.5	14.9	14.1	
105	301	299	292	279	262	241	216	190	165	150	136	122	101	79.3	58.1	40.8	25.6	12.5	12.0	
110	178	179	178	175	171	164	152	138	125	116	107	97.1	80.8	63.2	46.0	32.6	20.9	11.0	10.6	
115	151	150	148	142	134	125	118	111	104	97.8	90.3	81.0	66.7	51.4	36.6	25.6	16.5	9.21	3.33	
120	120	120	119	116	111	107	106	104	101	90.6	77.9	64.2	51.8	40.1	29.3	20.6	13.4	7.57	8.11	
125	109	110	111	112	112	110	104	96.6	87.3	76.0	64.0	52.1	41.6	32.1	23.7	16.7	10.9	6.45	7.56	
130	119	121	121	119	113	105	91.6	76.9	62.9	55.0	48.7	42.9	35.0	27.2	19.9	14.2	9.51	5.82	6.81	
135	109	105	99.2	90.1	80.0	69.9	62.3	55.7	49.8	45.0	40.4	35.6	29.3	23.0	16.9	12.3	8.42	5.35	5.89	
140	67.8	66.6	64.7	61.8	58.4	54.5	50.4	46.0	41.5	37.4	33.2	28.8	23.5	18.3	13.5	9.82	6.92	4.76	5.53	
145	54.0	53.2	51.9	50.2	48.0	45.3	41.8	38.1	34.2	31.0	27.6	23.7	17.5	11.3	6.05	3.68	3.06	4.20	4.82	
150	44.4	43.7	42.5	40.8	38.7	36.2	33.5	30.6	27.6	25.1	22.3	19.1	13.9	8.64	4.25	2.48	2.32	3.75	3.33	
155	32.4	31.7	30.7	29.7	28.6	27.3	25.9	24.4	22.6	20.4	17.7	14.7	10.6	6.68	3.43	2.15	2.12	3.33	3.94	
160	24.3	23.9	23.4	22.8	21.9	20.9	20.1	18.8	16.8	12.4	7.75	3.70	2.59	2.43	2.80	2.74	2.81	3.00	3.61	
165	16.8	16.6	16.3	16.0	15.5	14.4	11.8	8.94	6.15	4.36	3.05	2.22	2.06	2.21	2.51	2.58	2.64	2.69	3.21	
170	5.52	5.35	4.97	3.87	2.70	1.69	1.54	1.65	1.89	1.97	2.05	2.13	2.22	2.31	2.39	2.46	2.51	2.56	2.95	
175	1.95	1.96	1.99	2.02	2.06	2.11	2.17	2.23	2.30	2.36	2.41	2.47	2.52	2.57	2.61	2.65	2.68	2.71	2.85	
180	2.45	2.41	2.39	2.41	2.44	2.49	2.54	2.60	2.65	2.70	2.75	2.79	2.82	2.85	2.88	2.90	2.91	2.92	2.98	

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 (DEG)	0	472	479	482	482	481	482	482	481	480	479	480	480	481	478	476	474	476	478
5	395	371	348	326	305	284	264	245	229	216	206	201	199	199	200	201	201	201	200
10	341	297	250	216	201	223	269	339	447	564	676	748	804	847	884	910	922	910	884
15	251	223	243	310	422	622	833	1019	1090	1113	1097	1054	992	920	845	782	743	782	845
20	188	211	417	665	898	963	962	905	769	620	491	489	519	560	554	543	531	543	554
25	257	301	529	775	971	885	727	550	479	430	395	355	322	298	287	284	286	284	287
30	477	509	562	603	621	561	480	397	350	316	295	292	297	305	302	299	297	299	302
35	668	723	711	659	580	481	382	297	281	283	291	272	249	227	210	198	191	198	210
40	690	732	652	531	402	355	323	298	252	206	165	140	122	110	100	94.8	93.2	94.8	100
45	583	607	539	439	330	280	241	209	166	126	91.8	71.1	57.1	48.3	42.1	39.2	38.8	39.2	42.1
50	452	464	422	357	280	220	165	117	84.2	59.3	41.7	30.4	23.7	20.3	17.4	16.0	15.9	16.0	17.4
55	373	375	331	269	199	148	103	66.3	44.7	30.8	22.6	15.7	11.6	9.46	8.23	7.98	8.34	7.98	8.23
60	298	288	242	184	125	88.6	60.3	39.3	26.0	17.7	13.0	8.70	6.00	4.53	3.76	3.60	3.82	3.60	3.76
65	224	208	166	117	70.3	47.8	33.3	24.4	17.0	12.2	9.15	5.93	3.57	1.99	1.39	1.32	1.55	1.32	1.39
70	159	141	109	74.9	44.0	30.4	22.7	18.6	13.7	10.1	7.29	4.61	2.53	1.10	0.72	0.79	1.10	0.79	0.72
75	107	90.8	69.3	48.1	29.6	21.8	17.7	15.8	12.4	9.59	7.18	4.90	3.06	1.74	1.41	1.49	1.76	1.49	1.41
80	56.6	47.6	38.5	30.3	23.4	19.4	16.6	14.5	11.7	9.19	6.92	5.02	3.52	2.47	2.21	2.28	2.52	2.28	2.21
85	35.0	32.3	27.9	23.2	18.7	16.2	14.3	12.6	10.5	8.42	6.55	5.07	3.92	3.13	2.94	3.01	3.19	3.01	2.94
90	20.4	20.0	18.2	16.0	13.8	12.5	11.3	10.2	8.74	7.26	5.90	4.94	4.21	3.74	3.64	3.70	3.83	3.70	3.64
95	15.1	14.6	13.3	11.7	10.0	9.18	8.48	7.83	6.82	5.84	4.98	4.54	4.27	4.16	4.14	4.19	4.26	4.19	4.14
100	13.3	12.3	11.0	9.74	8.56	7.86	7.30	6.80	6.09	5.42	4.86	4.61	4.49	4.47	4.49	4.53	4.58	4.53	4.49
105	11.4	10.7	9.71	8.70	7.77	7.26	6.85	6.49	5.93	5.39	4.94	4.77	4.70	4.70	4.72	4.76	4.80	4.76	4.72
110	10.1	9.46	8.71	7.94	7.25	6.85	6.53	6.23	5.74	5.27	4.88	4.72	4.67	4.67	4.69	4.71	4.74	4.71	4.69
115	8.93	8.58	7.97	7.32	6.70	6.41	6.18	5.97	5.55	5.14	4.79	4.66	4.61	4.61	4.62	4.64	4.65	4.64	4.62
120	8.36	8.32	7.79	7.12	6.44	6.19	6.01	5.84	5.47	5.10	4.78	4.65	4.60	4.60	4.59	4.59	4.60	4.59	4.59
125	8.22	8.41	7.84	7.03	6.20	5.98	5.87	5.80	5.51	5.20	4.94	4.86	4.83	4.84	4.83	4.82	4.81	4.82	4.83
130	7.42	7.65	7.27	6.69	6.07	5.88	5.76	5.68	5.47	5.26	5.10	5.08	5.10	5.14	5.14	5.14	5.12	5.14	5.14
135	6.24	6.41	6.31	6.10	5.84	5.70	5.58	5.46	5.31	5.19	5.11	5.14	5.21	5.29	5.32	5.33	5.32	5.33	5.32
140	6.04	6.29	6.14	5.83	5.47	5.30	5.18	5.10	5.03	4.99	4.99	5.07	5.17	5.27	5.31	5.33	5.33	5.33	5.31
145	5.25	5.48	5.41	5.23	4.99	4.87	4.78	4.73	4.72	4.75	4.80	4.90	5.01	5.11	5.16	5.19	5.19	5.19	5.16
150	4.75	4.99	4.98	4.86	4.69	4.58	4.49	4.44	4.47	4.53	4.61	4.68	4.74	4.80	4.85	4.89	4.89	4.89	4.85
155	4.38	4.64	4.65	4.54	4.38	4.31	4.25	4.21	4.24	4.29	4.34	4.36	4.37	4.37	4.36	4.35	4.31	4.35	4.36
160	4.04	4.31	4.31	4.21	4.07	4.10	4.14	4.18	4.18	4.15	4.12	4.09	4.05	4.00	3.92	3.83	3.73	3.83	3.92
165	3.59	3.85	3.90	3.86	3.80	3.84	3.89	3.92	3.86	3.78	3.68	3.57	3.45	3.33	3.23	3.14	3.05	3.14	3.23
170	3.23	3.42	3.46	3.43	3.37	3.37	3.35	3.30	3.16	2.99	2.80	2.60	2.42	2.27	2.20	2.17	2.18	2.17	2.20
175	3.12	3.23	3.25	3.22	3.17	3.14	3.10	3.03	2.88	2.72	2.56	2.44	2.35	2.29	2.26	2.27	2.29	2.27	2.26
180	2.85	2.83	2.82	2.83	2.84	2.85	2.86	2.86	2.82	2.76	2.69	2.62	2.54	2.47	2.43	2.40	2.39	2.40	2.43

C (DEG)																UNIT: °C			
γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	481	480	480	479	480	481	482	482	482	481	482	482	479	472	461				
5	199	199	201	206	216	229	245	264	284	305	326	348	371	395	420				
10	847	804	748	676	564	447	339	269	223	201	216	250	297	341	391				
15	920	992	1054	1097	1113	1090	1019	833	622	422	310	243	223	251	327				
20	560	519	489	491	620	769	905	962	963	898	665	417	211	188	268				
25	298	322	355	395	430	479	550	727	885	971	775	529	301	257	303				
30	305	297	292	295	316	350	397	480	561	621	603	562	509	477	447				
35	227	249	272	291	283	281	297	382	481	580	659	711	723	668	562				
40	110	122	140	165	206	252	298	323	355	402	531	652	732	690	573				
45	48.3	57.1	71.1	91.8	126	166	209	241	280	330	439	539	607	583	500				
50	20.3	23.7	30.4	41.7	59.3	84.2	117	165	220	280	357	422	464	452	403				
55	9.46	11.6	15.7	22.6	30.8	44.7	66.3	103	148	199	269	331	375	373	341				
60	4.53	6.00	8.70	13.0	17.7	26.0	39.3	60.3	88.6	125	184	242	288	298	287				
65	1.99	3.57	5.93	9.15	12.2	17.0	24.4	33.3	47.8	70.3	117	166	208	224	225				
70	1.10	2.53	4.61	7.29	10.1	13.7	18.6	22.7	30.4	44.0	74.9	109	141	159	171				
75	1.74	3.06	4.90	7.18	9.59	12.4	15.8	17.7	21.8	29.6	48.1	69.3	90.8	107	121				
80	2.47	3.52	5.02	6.92	9.19	11.7	14.5	16.6	19.4	23.4	30.3	38.5	47.6	56.6	66.1				
85	3.13	3.92	5.07	6.55	8.42	10.5	12.6	14.3	16.2	18.7	23.2	27.9	32.3	35.0	36.9				
90	3.74	4.21	4.94	5.90	7.26	8.74	10.2	11.3	12.5	13.8	16.0	18.2	20.0	20.4	19.9				
95	4.16	4.27	4.54	4.98	5.84	6.82	7.83	8.48	9.18	10.0	11.7	13.3	14.6	15.1	15.1				
100	4.47	4.49	4.61	4.86	5.42	6.09	6.80	7.30	7.86	8.56	9.74	11.0	12.3	13.3	14.1				
105	4.70	4.70	4.77	4.94	5.39	5.93	6.49	6.85	7.26	7.77	8.70	9.71	10.7	11.4	12.0				
110	4.67	4.67	4.72	4.88	5.27	5.74	6.23	6.53	6.85	7.25	7.94	8.71	9.46	10.1	10.6				
115	4.61	4.61	4.66	4.79	5.14	5.55	5.97	6.18	6.41	6.70	7.32	7.97	8.58	8.93	9.14				
120	4.60	4.60	4.65	4.78	5.10	5.47	5.84	6.01	6.19	6.44	7.12	7.79	8.32	8.36	8.11				
125	4.84	4.83	4.86	4.94	5.20	5.51	5.80	5.87	5.98	6.20	7.03	7.84	8.41	8.22	7.56				
130	5.14	5.10	5.08	5.10	5.26	5.47	5.68	5.76	5.88	6.07	6.69	7.27	7.65	7.42	6.81				
135	5.29	5.21	5.14	5.11	5.19	5.31	5.46	5.58	5.70	5.84	6.10	6.31	6.41	6.24	5.89				
140	5.27	5.17	5.07	4.99	4.99	5.03	5.10	5.18	5.30	5.47	5.83	6.14	6.29	6.04	5.53				
145	5.11	5.01	4.90	4.80	4.75	4.72	4.73	4.78	4.87	4.99	5.23	5.41	5.48	5.25	4.82				
150	4.80	4.74	4.68	4.61	4.53	4.47	4.44	4.49	4.58	4.69	4.86	4.98	4.99	4.75	4.33				
155	4.37	4.37	4.36	4.34	4.29	4.24	4.21	4.25	4.31	4.38	4.54	4.65	4.64	4.38	3.94				
160	4.00	4.05	4.09	4.12	4.15	4.18	4.18	4.14	4.10	4.07	4.21	4.31	4.31	4.04	3.61				
165	3.33	3.45	3.57	3.68	3.78	3.86	3.92	3.89	3.84	3.80	3.86	3.90	3.85	3.59	3.21				
170	2.27	2.42	2.60	2.80	2.99	3.16	3.30	3.35	3.37	3.37	3.43	3.46	3.42	3.23	2.95				
175	2.29	2.35	2.44	2.56	2.72	2.88	3.03	3.10	3.14	3.17	3.22	3.25	3.23	3.12	2.95				
180	2.47	2.54	2.62	2.69	2.76	2.82	2.86	2.86	2.85	2.84	2.82	2.82	2.83	2.82	2.83				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34L @ 75W / 5000K	Sample ID	230612001-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	0.609	72.3	0.990	4.23
277.0	60	0.309	71.6	0.837	17.67

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*****