

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

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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		16472
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		156.9
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		15864
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	151.1
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		105.0
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	3.77
			277V	11.89
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
			277V	0.899
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5048
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		74.7
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-27
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		0.879
(Goniophotometer – Section 4.2)		Non-Worst Case		0.410
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		105.0
(Goniophotometer – Section 4.2)		Non-Worst Case		102.3

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-12	W34L @ 100W / 5000K	230612001-S1
2	Goniophotometer Test	2023-06-12	W34L @ 100W / 5000K	230612001-S1
3	THD and PF Test	2023-06-12	W34L @ 100W / 5000K	230612001-S1

Remark (If any)

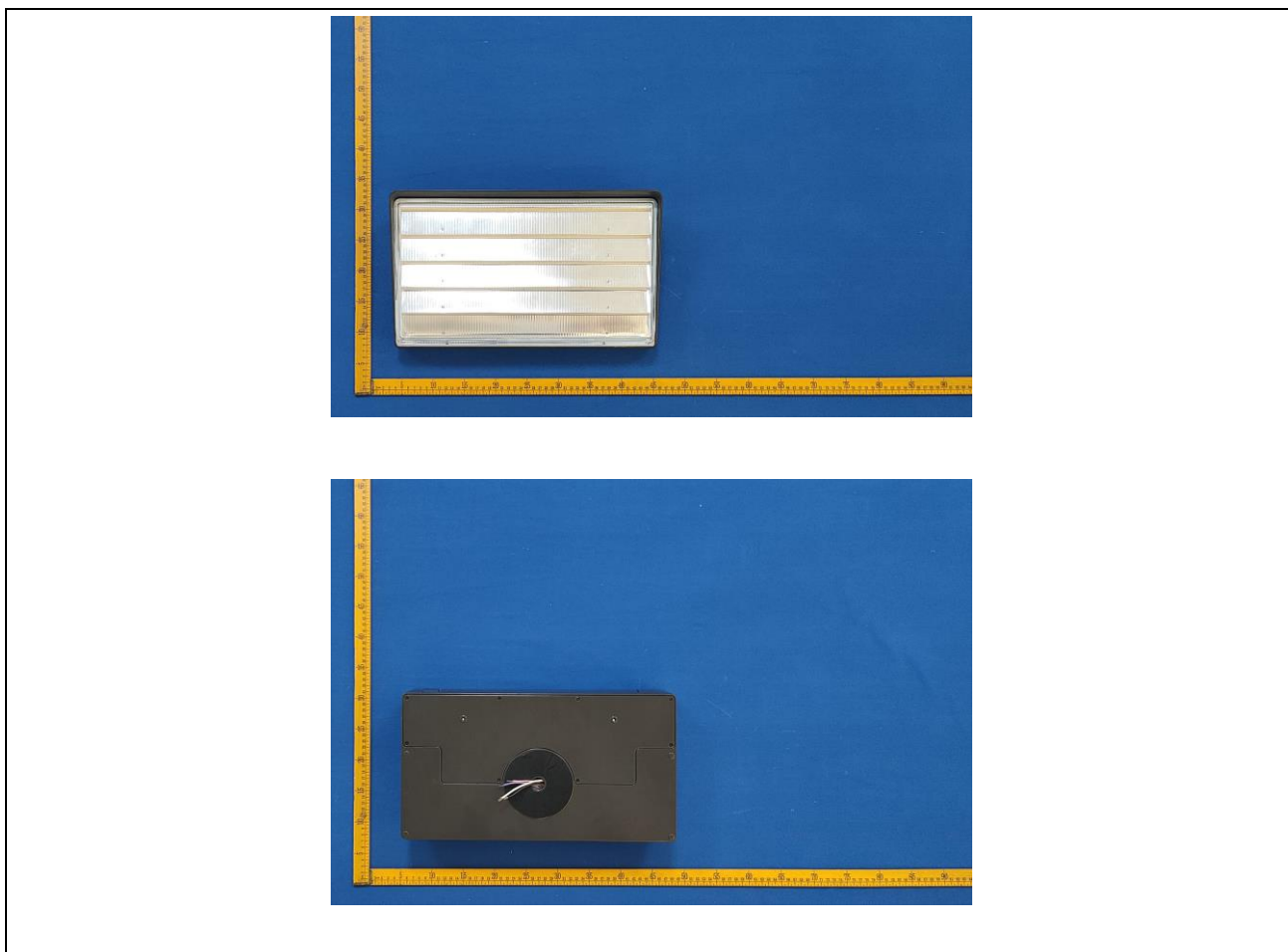
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34L @ 100W / 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 @ 100W / 5000K	Sample ID	230612001-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

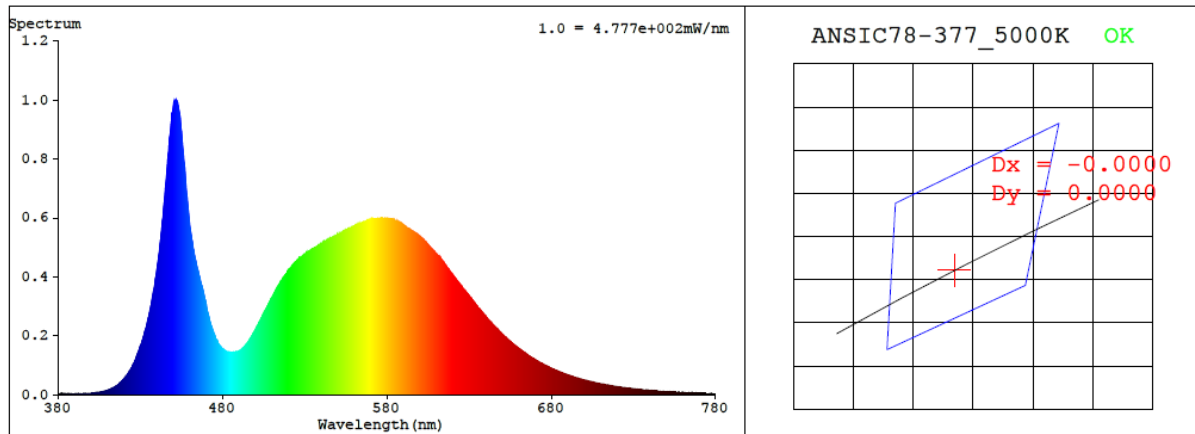
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.879	105.0	0.995
277.0	60	0.410	102.3	0.899

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5048	74.7	-27	0.0001	75	94	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3438$ $y = 0.3506$ / $u' = 0.2109$ $v' = 0.4840$ ($duv=2.69e-05$)

CCT= 5048K Prcp WL: $L_d=572.1nm$ Purity=8.3%

Peak WL: $L_p=452nm$ FWHM: $=20.4nm$ Ratio: $R=14.6\%$ $G=81.7\%$ $B=3.7\%$

Render Index: $R_a = 74.7$ $AvgR = 65.0$ $TM30:R_f=75$ $R_g=93$

EEL: 0.08674 A++ Highest

$R_1 = 72$ $R_2 = 81$ $R_3 = 86$ $R_4 = 74$ $R_5 = 73$ $R_6 = 73$ $R_7 = 82$

$R_8 = 56$ $R_9 = -27$ $R_{10} = 54$ $R_{11} = 70$ $R_{12} = 48$ $R_{13} = 74$ $R_{14} = 92$ $R_{15} = 67$

4.1 Integrating Sphere Test

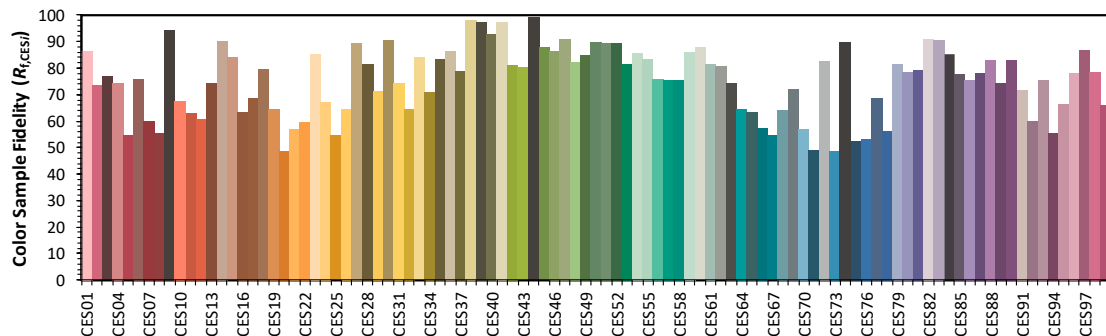
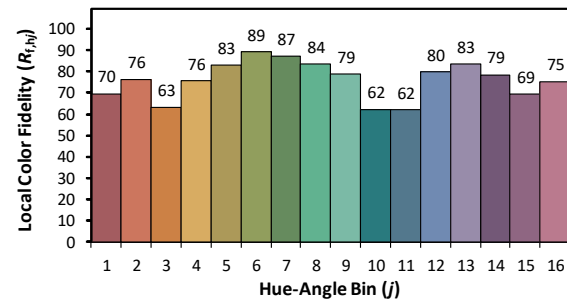
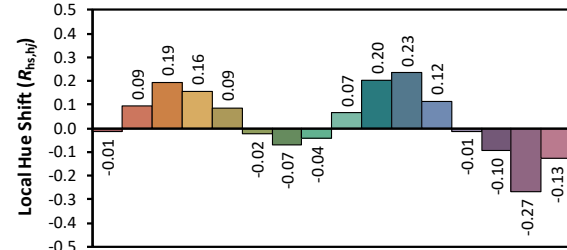
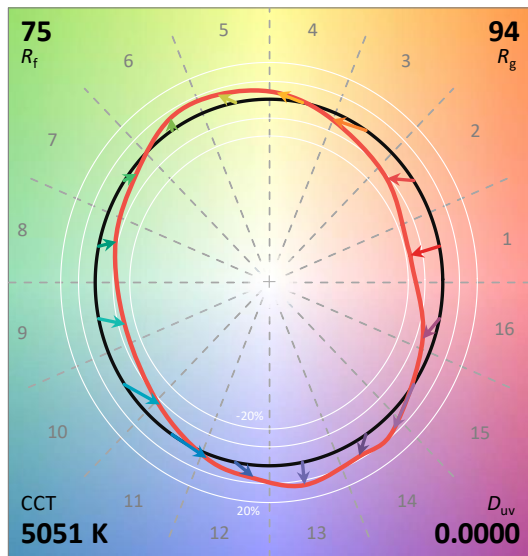
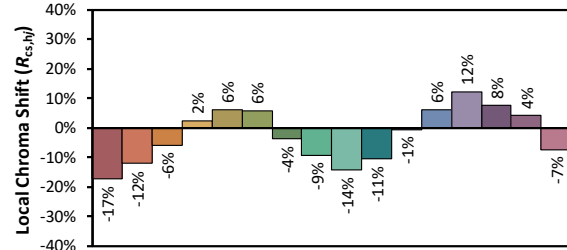
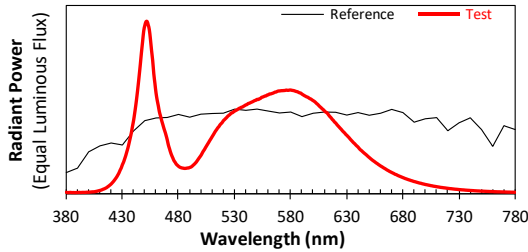
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/13

Model: W34L @ 100W / 5000K



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

x 0.3437

y 0.3504

u' 0.2109

v' 0.4839

CIE 13.3-1995
(CRI)

R_a 75

R_g -27

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

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	4.70E-06	447	8.18E-04	514	3.69E-04	581	5.98E-04	648	2.18E-04	715	3.21E-05
381	2.90E-06	448	8.80E-04	515	3.80E-04	582	5.97E-04	649	2.12E-04	716	3.10E-05
382	3.10E-06	449	9.42E-04	516	3.87E-04	583	5.95E-04	650	2.07E-04	717	3.03E-05
383	3.40E-06	450	9.74E-04	517	3.97E-04	584	5.93E-04	651	2.01E-04	718	2.94E-05
384	3.80E-06	451	9.96E-04	518	4.04E-04	585	5.91E-04	652	1.96E-04	719	2.84E-05
385	2.60E-06	452	9.98E-04	519	4.11E-04	586	5.89E-04	653	1.91E-04	720	2.76E-05
386	3.10E-06	453	9.79E-04	520	4.21E-04	587	5.86E-04	654	1.86E-04	721	2.66E-05
387	2.80E-06	454	9.50E-04	521	4.27E-04	588	5.83E-04	655	1.81E-04	722	2.58E-05
388	2.60E-06	455	8.95E-04	522	4.34E-04	589	5.81E-04	656	1.76E-04	723	2.53E-05
389	3.10E-06	456	8.29E-04	523	4.40E-04	590	5.76E-04	657	1.72E-04	724	2.44E-05
390	3.20E-06	457	7.71E-04	524	4.48E-04	591	5.72E-04	658	1.67E-04	725	2.37E-05
391	3.70E-06	458	6.94E-04	525	4.53E-04	592	5.67E-04	659	1.63E-04	726	2.29E-05
392	3.80E-06	459	6.37E-04	526	4.58E-04	593	5.64E-04	660	1.58E-04	727	2.23E-05
393	3.10E-06	460	5.82E-04	527	4.66E-04	594	5.60E-04	661	1.54E-04	728	2.18E-05
394	3.80E-06	461	5.41E-04	528	4.67E-04	595	5.58E-04	662	1.50E-04	729	2.11E-05
395	4.00E-06	462	5.08E-04	529	4.72E-04	596	5.54E-04	663	1.46E-04	730	2.03E-05
396	3.80E-06	463	4.72E-04	530	4.77E-04	597	5.49E-04	664	1.42E-04	731	1.98E-05
397	4.00E-06	464	4.48E-04	531	4.80E-04	598	5.47E-04	665	1.38E-04	732	1.92E-05
398	4.70E-06	465	4.22E-04	532	4.84E-04	599	5.42E-04	666	1.34E-04	733	1.86E-05
399	4.90E-06	466	4.00E-04	533	4.88E-04	600	5.38E-04	667	1.30E-04	734	1.83E-05
400	4.70E-06	467	3.76E-04	534	4.92E-04	601	5.33E-04	668	1.26E-04	735	1.76E-05
401	5.80E-06	468	3.57E-04	535	4.95E-04	602	5.28E-04	669	1.23E-04	736	1.70E-05
402	5.90E-06	469	3.34E-04	536	4.99E-04	603	5.21E-04	670	1.20E-04	737	1.66E-05
403	7.00E-06	470	3.09E-04	537	5.01E-04	604	5.16E-04	671	1.16E-04	738	1.60E-05
404	7.10E-06	471	2.79E-04	538	5.05E-04	605	5.09E-04	672	1.13E-04	739	1.58E-05
405	7.60E-06	472	2.58E-04	539	5.09E-04	606	5.03E-04	673	1.09E-04	740	1.50E-05
406	8.90E-06	473	2.36E-04	540	5.13E-04	607	4.97E-04	674	1.07E-04	741	1.47E-05
407	1.02E-05	474	2.18E-04	541	5.15E-04	608	4.90E-04	675	1.04E-04	742	1.43E-05
408	1.18E-05	475	2.03E-04	542	5.21E-04	609	4.85E-04	676	1.01E-04	743	1.39E-05
409	1.36E-05	476	1.88E-04	543	5.22E-04	610	4.78E-04	677	9.81E-05	744	1.33E-05
410	1.52E-05	477	1.79E-04	544	5.25E-04	611	4.72E-04	678	9.54E-05	745	1.30E-05
411	1.71E-05	478	1.69E-04	545	5.29E-04	612	4.68E-04	679	9.26E-05	746	1.25E-05
412	1.97E-05	479	1.62E-04	546	5.31E-04	613	4.61E-04	680	8.99E-05	747	1.23E-05
413	2.27E-05	480	1.56E-04	547	5.35E-04	614	4.52E-04	681	8.73E-05	748	1.20E-05
414	2.50E-05	481	1.51E-04	548	5.38E-04	615	4.44E-04	682	8.45E-05	749	1.14E-05
415	2.84E-05	482	1.48E-04	549	5.40E-04	616	4.38E-04	683	8.24E-05	750	1.12E-05
416	3.19E-05	483	1.46E-04	550	5.45E-04	617	4.29E-04	684	7.99E-05	751	1.09E-05
417	3.70E-05	484	1.45E-04	551	5.44E-04	618	4.22E-04	685	7.76E-05	752	1.07E-05
418	4.17E-05	485	1.44E-04	552	5.48E-04	619	4.14E-04	686	7.56E-05	753	1.03E-05
419	4.71E-05	486	1.44E-04	553	5.50E-04	620	4.08E-04	687	7.32E-05	754	1.01E-05
420	5.27E-05	487	1.44E-04	554	5.56E-04	621	4.00E-04	688	7.14E-05	755	9.70E-06
421	5.99E-05	488	1.46E-04	555	5.59E-04	622	3.92E-04	689	6.91E-05	756	9.50E-06
422	6.72E-05	489	1.46E-04	556	5.61E-04	623	3.85E-04	690	6.70E-05	757	9.10E-06
423	7.57E-05	490	1.49E-04	557	5.64E-04	624	3.78E-04	691	6.56E-05	758	8.90E-06
424	8.46E-05	491	1.51E-04	558	5.65E-04	625	3.71E-04	692	6.35E-05	759	8.80E-06
425	9.42E-05	492	1.55E-04	559	5.70E-04	626	3.63E-04	693	6.16E-05	760	8.50E-06
426	1.06E-04	493	1.62E-04	560	5.71E-04	627	3.56E-04	694	5.97E-05	761	8.10E-06
427	1.18E-04	494	1.67E-04	561	5.76E-04	628	3.50E-04	695	5.79E-05	762	7.80E-06
428	1.33E-04	495	1.74E-04	562	5.76E-04	629	3.42E-04	696	5.69E-05	763	7.70E-06
429	1.46E-04	496	1.82E-04	563	5.79E-04	630	3.36E-04	697	5.46E-05	764	7.30E-06
430	1.65E-04	497	1.91E-04	564	5.81E-04	631	3.29E-04	698	5.31E-05	765	7.20E-06
431	1.79E-04	498	2.01E-04	565	5.84E-04	632	3.22E-04	699	5.15E-05	766	7.20E-06
432	1.98E-04	499	2.10E-04	566	5.87E-04	633	3.14E-04	700	4.99E-05	767	6.80E-06
433	2.18E-04	500	2.19E-04	567	5.88E-04	634	3.07E-04	701	4.87E-05	768	6.60E-06
434	2.41E-04	501	2.30E-04	568	5.91E-04	635	3.00E-04	702	4.73E-05	769	6.40E-06
435	2.64E-04	502	2.43E-04	569	5.94E-04	636	2.93E-04	703	4.59E-05	770	6.30E-06
436	2.92E-04	503	2.52E-04	570	5.94E-04	637	2.87E-04	704	4.46E-05	771	6.20E-06
437	3.21E-04	504	2.63E-04	571	5.95E-04	638	2.80E-04	705	4.30E-05	772	5.90E-06
438	3.51E-04	505	2.74E-04	572	5.96E-04	639	2.73E-04	706	4.21E-05	773	5.70E-06
439	3.88E-04	506	2.85E-04	573	5.96E-04	640	2.68E-04	707	4.04E-05	774	5.50E-06
440	4.23E-04	507	2.96E-04	574	5.96E-04	641	2.59E-04	708	3.94E-05	775	5.50E-06
441	4.66E-04	508	3.07E-04	575	5.97E-04	642	2.52E-04	709	3.83E-05	776	5.20E-06
442	5.13E-04	509	3.17E-04	576	5.99E-04	643	2.47E-04	710	3.72E-05	777	4.90E-06
443	5.66E-04	510	3.28E-04	577	5.98E-04	644	2.41E-04	711	3.60E-05	778	5.00E-06
444	6.23E-04	511	3.39E-04	578	5.98E-04	645	2.35E-04	712	3.51E-05	779	4.80E-06
445	6.85E-04	512	3.50E-04	579	5.99E-04	646	2.30E-04	713	3.38E-05	780	4.80E-06
446	7.49E-04	513	3.61E-04	580	5.99E-04	647	2.24E-04	714	3.27E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34L @ 100W / 5000K	Sample ID	230612001-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	40.5

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	0.879	105.0	0.995
NON-WORST CASE	277.0	60	0.410	102.3	0.899

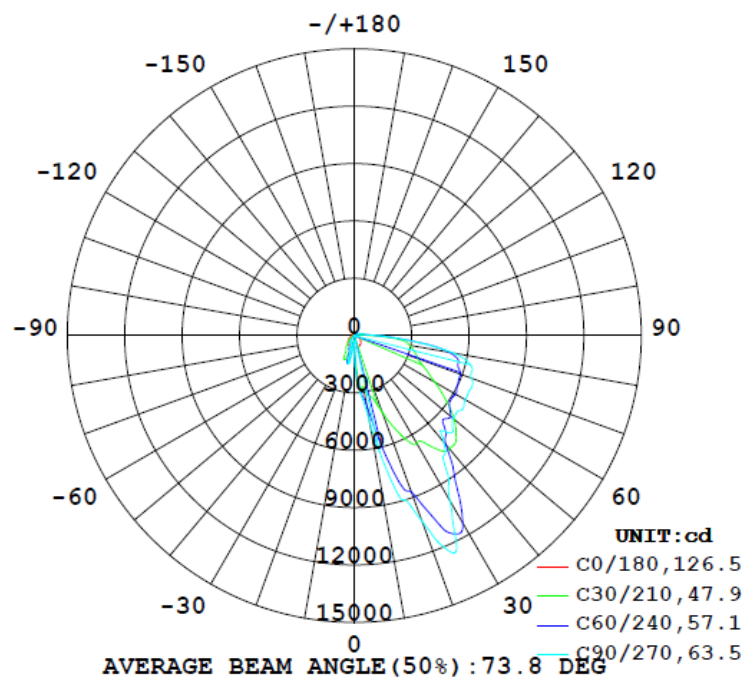
Test Result

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	16472	104.1	134.5	63.1	83.8	156.9	7.3%	B1-U3-G5
0°-90° zones	15864	104.1	134.5	63.1	83.8	151.1	7.6%	B1-U3-G5

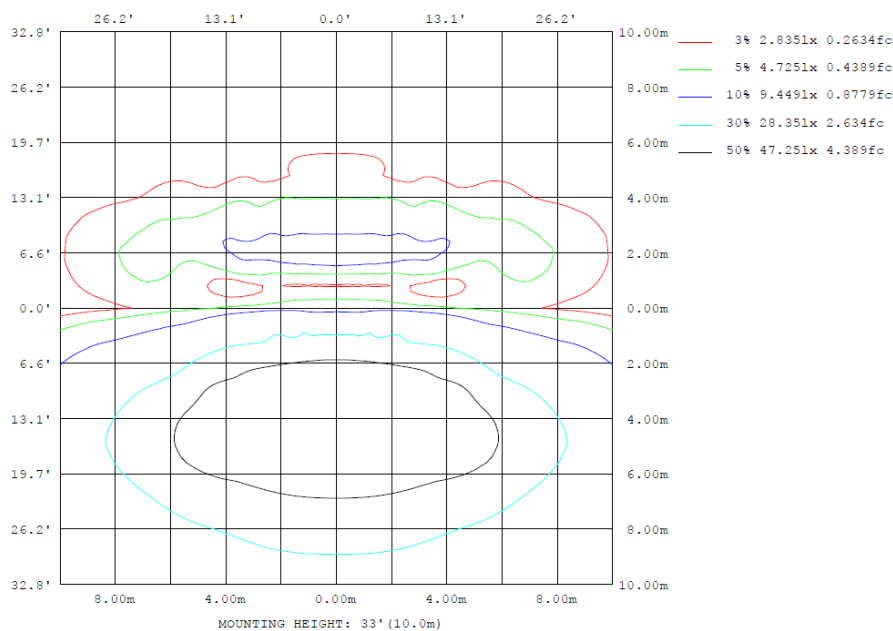
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

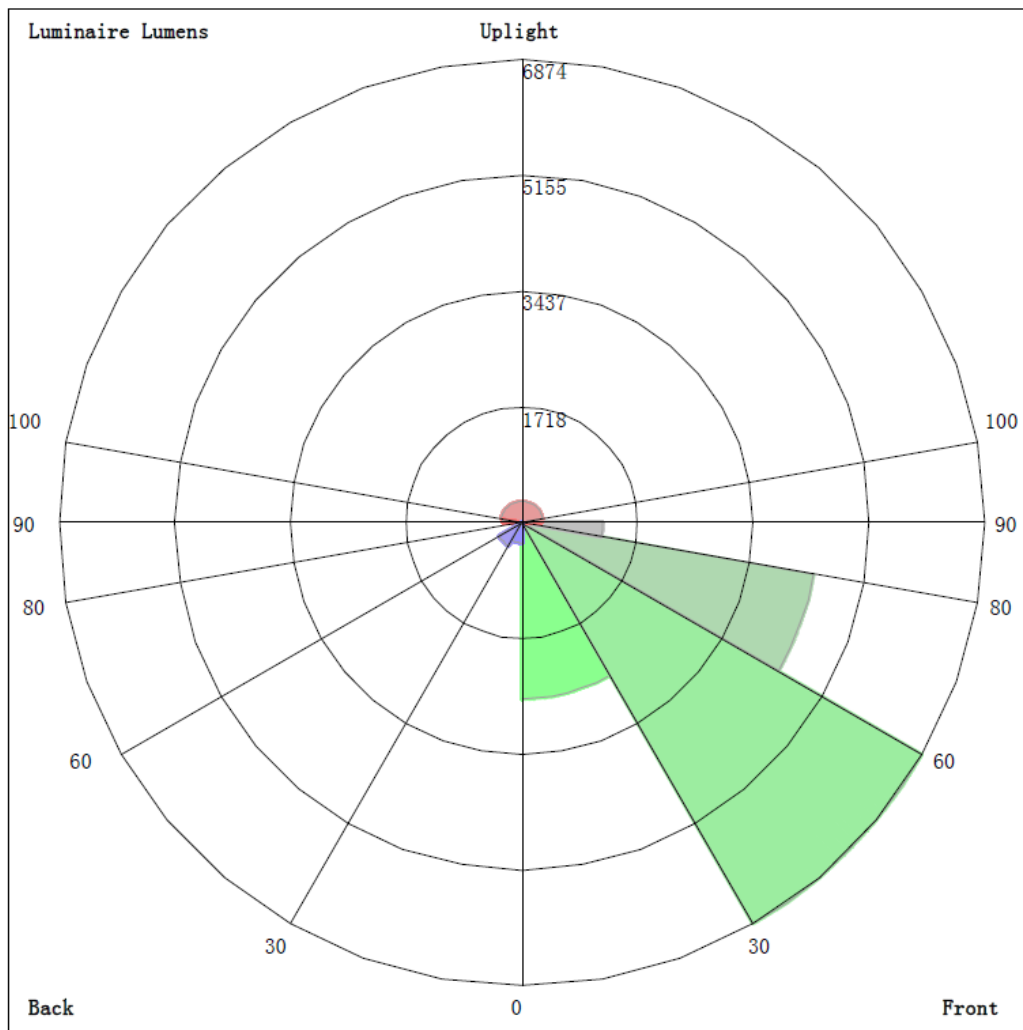
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	ℓlum, lamp
10	61.63	327.2	452.5	327.2	61.63	47.54	129.4	47.54	0- 10	140.2	140.2	0.85,0.85
20	62.12	726.1	1030	726.1	62.12	122.4	73.20	122.4	10- 20	845.7	985.9	5.99,5.99
30	57.93	1048	1002	1048	57.93	54.46	41.00	54.46	20- 30	1927	2912	17.7,17.7
40	52.47	895.6	726.2	895.6	52.47	41.20	12.70	41.20	30- 40	2418	5330	32.4,32.4
50	43.87	611.7	671.6	611.7	43.87	16.11	2.239	16.11	40- 50	2441	7771	47.2,47.2
60	34.99	540.4	670.5	540.4	34.99	5.372	0.5203	5.372	50- 60	2406	10177	61.8,61.8
70	24.30	506.3	651.2	506.3	24.30	2.568	0.1525	2.568	60- 70	2331	12508	75.9,75.9
80	10.67	450.0	524.9	450.0	10.67	1.996	0.3491	1.996	70- 80	2148	14656	89,89
90	2.594	110.6	121.7	110.6	2.594	1.413	0.5310	1.413	80- 90	1208	15864	96.3,96.3
100	2.056	38.66	52.90	38.66	2.056	0.9401	0.6346	0.9401	90-100	292.5	16156	98.1,98.1
110	1.527	17.30	24.67	17.30	1.527	0.8600	0.6556	0.8600	100-110	134.4	16291	98.9,98.9
120	1.060	13.93	16.62	13.93	1.060	0.8067	0.6363	0.8067	110-120	71.39	16362	99.3,99.3
130	0.8080	8.857	16.10	8.857	0.8080	0.7845	0.7096	0.7845	120-130	49.74	16412	99.6,99.6
140	0.6610	5.754	9.679	5.754	0.6610	0.7045	0.7369	0.7045	130-140	32.86	16445	99.8,99.8
150	0.5192	3.821	6.175	3.821	0.5192	0.6132	0.6756	0.6132	140-150	16.28	16461	99.9,99.9
160	0.4152	2.333	3.405	2.333	0.4152	0.5778	0.5152	0.5778	150-160	7.790	16469	100,100
170	0.3542	0.2610	0.9033	0.2610	0.3542	0.4547	0.3007	0.4547	160-170	2.506	16471	100,100
180	0.4034	0.3665	0.3459	0.3665	0.4034	0.3963	0.3297	0.3963	170-180	0.3321	16472	100,100
DEG	LUMINOUS INTENSITY:×10cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	140.23	0-10	140.23	0.85%
10-20	845.66	0-20	985.89	5.99%
20-30	1926.54	0-30	2912.43	17.68%
30-40	2417.89	0-40	5330.32	32.36%
40-50	2441.15	0-50	7771.47	47.18%
50-60	2405.76	0-60	10177.23	61.79%
60-70	2330.50	0-70	12507.73	75.94%
70-80	2147.86	0-80	14655.59	88.98%
80-90	1208.25	0-90	15863.84	96.31%
90-100	292.54	0-100	16156.38	98.09%
100-110	134.38	0-110	16290.76	98.90%
110-120	71.39	0-120	16362.15	99.34%
120-130	49.74	0-130	16411.89	99.64%
130-140	32.86	0-140	16444.75	99.84%
140-150	16.28	0-150	16461.03	99.94%
150-160	7.79	0-160	16468.82	99.98%
160-170	2.51	0-170	16471.33	100.00%
170-180	0.33	0-180	16471.66	100.00%

4.2 Goniophotometer Test

LCS/BUG

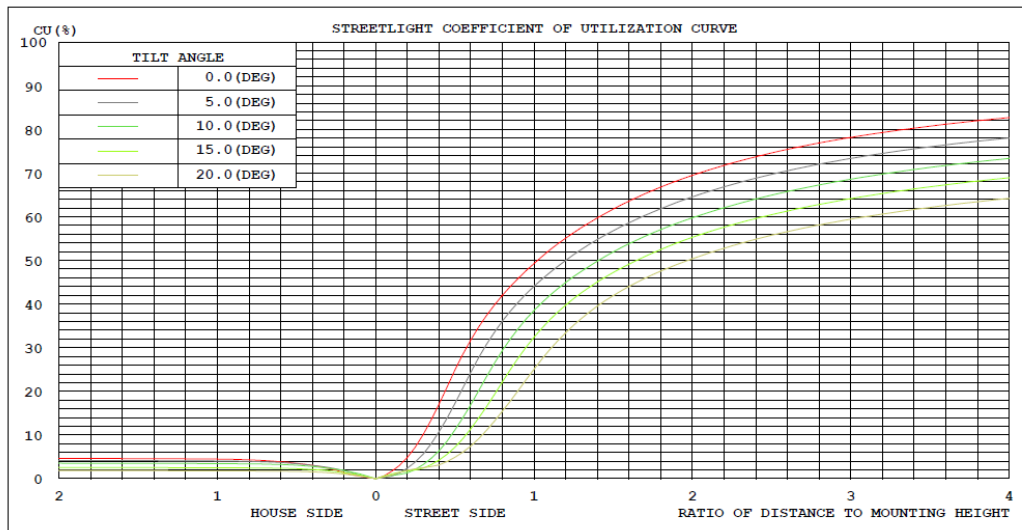


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

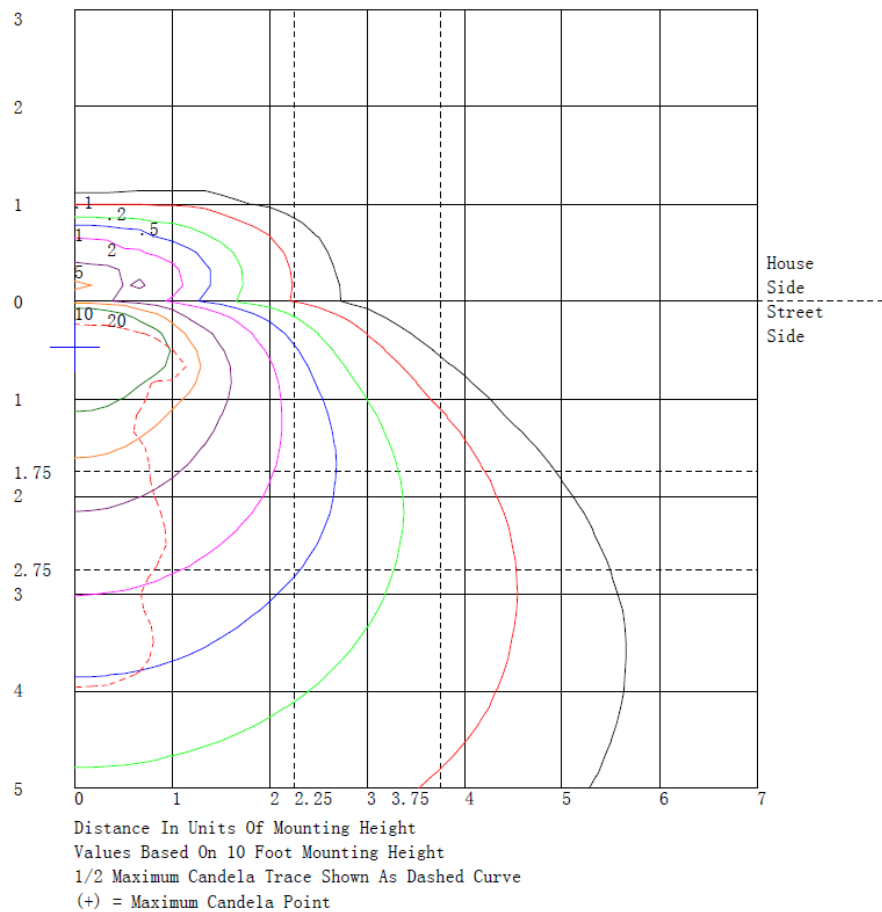
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	2613.1	N.A.	15.9
FM - Front-Medium (30-60)	6873.8	N.A.	41.7
FH - Front-High (60-80)	4403.5	N.A.	26.7
FVH - Front-Very High (80-90)	1196.2	N.A.	7.3
BL - Back-Low (0-30)	299.3	N.A.	1.8
BM - Back-Medium (30-60)	391.0	N.A.	2.4
BH - Back-High (60-80)	74.8	N.A.	0.5
BVH - Back-Very High (80-90)	12.1	N.A.	0.1
UL - Uplight-Low (90-100)	292.5	N.A.	1.8
UH - Uplight-High (100-180)	315.3	N.A.	1.9
Total	16471.6	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

C (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
γ (DEG)	0	61.8	61.9	62.0	62.1	62.2	62.3	62.4	62.5	62.6	62.7	62.9	63.1	63.2	63.4	63.5	63.7	63.9	64.1	64.3
5	61.7	73.5	90.9	114	148	183	217	242	261	274	277	275	272	270	269	268	268	268	269	270
10	61.6	134	192	235	255	267	274	292	310	327	340	353	367	390	412	432	444	451	453	454
15	62.1	153	225	279	302	315	330	370	419	475	540	606	669	717	758	791	816	831	837	838
20	62.1	146	221	287	330	373	425	523	627	726	785	831	870	917	960	995	1016	1027	1030	1031
25	60.3	137	217	300	388	478	570	660	751	843	946	1044	1128	1177	1210	1231	1245	1251	1252	1253
30	57.9	127	207	300	408	526	651	796	932	1048	1105	1133	1135	1110	1075	1037	1018	1006	1002	1003
35	55.9	132	221	324	449	581	712	847	960	1038	1023	976	918	893	873	858	840	828	822	823
40	52.5	141	243	356	502	646	772	844	886	896	855	800	745	737	739	745	739	731	726	727
45	49.5	142	245	358	506	644	754	769	751	716	694	674	660	666	678	693	705	715	720	721
50	43.9	122	211	311	450	580	681	679	649	612	622	639	657	662	664	664	667	670	672	673
55	38.5	123	211	300	406	504	581	596	592	579	587	597	609	623	638	652	665	676	681	682
60	35.0	112	188	263	346	422	485	513	529	540	565	589	612	628	642	652	662	668	671	672
65	29.2	93.2	157	220	287	351	409	455	494	527	555	578	598	617	633	646	657	665	668	669
70	24.3	62.4	107	159	223	289	355	411	462	506	540	568	590	609	624	635	644	649	651	652
75	18.3	38.7	71.4	116	182	254	326	384	437	481	514	540	561	584	604	620	629	634	635	636
80	10.7	24.1	51.0	91.3	153	222	293	353	406	450	477	494	505	515	520	524	525	526	525	526
85	5.27	14.4	35.2	67.8	123	182	236	262	277	285	289	289	287	286	284	282	282	281	280	281
90	2.59	10.2	20.8	34.6	54.9	75.7	94.4	103	108	111	115	118	120	122	122	122	122	122	122	122
95	2.00	5.71	10.7	16.8	25.6	34.6	42.9	47.3	50.6	53.3	57.1	60.7	63.8	65.6	66.7	67.4	67.9	68.0	67.9	67.9
100	2.06	4.63	7.71	11.3	15.6	20.3	25.1	29.8	34.3	38.7	42.7	46.2	49.0	50.6	51.6	52.1	52.6	52.9	52.9	52.9
105	1.72	3.55	5.66	8.07	11.0	14.1	17.0	18.9	20.8	22.9	26.4	30.1	33.7	36.5	38.9	40.7	41.5	41.8	41.7	41.7
110	1.53	2.91	4.53	6.40	8.77	11.2	13.4	14.8	16.1	17.3	19.2	21.1	22.7	23.6	24.2	24.5	24.7	24.7	24.7	24.7
115	1.28	2.27	3.54	5.08	7.16	9.31	11.3	12.6	13.6	14.4	15.4	16.4	17.4	18.6	19.7	20.5	20.8	20.9	20.8	20.8
120	1.06	1.85	2.85	4.07	5.59	7.25	8.99	10.8	12.5	13.9	14.4	14.6	14.7	15.3	16.0	16.5	16.7	16.7	16.6	16.6
125	0.89	1.52	2.31	3.28	4.46	5.79	7.24	8.93	10.6	12.2	13.4	14.4	15.0	15.3	15.4	15.3	15.1	15.0	14.9	14.9
130	0.81	1.32	1.97	2.76	3.76	4.85	5.96	6.80	7.73	8.86	10.8	12.8	14.6	15.6	16.3	16.7	16.6	16.4	16.1	16.1
135	0.74	1.17	1.70	2.35	3.18	4.07	4.94	5.59	6.23	6.92	7.77	8.73	9.82	11.2	12.6	13.9	14.7	15.2	15.4	15.4
140	0.66	0.96	1.37	1.87	2.54	3.27	4.00	4.60	5.18	5.75	6.36	6.97	7.56	8.15	8.68	9.13	9.43	9.61	9.68	9.68
145	0.58	0.44	0.54	0.87	1.59	2.44	3.29	3.83	4.29	4.73	5.27	5.79	6.27	6.65	6.96	7.20	7.38	7.49	7.52	7.52
150	0.52	0.32	0.34	0.59	1.20	1.93	2.66	3.10	3.48	3.82	4.24	4.64	5.03	5.36	5.65	5.88	6.04	6.14	6.17	6.17
155	0.46	0.29	0.30	0.48	0.93	1.48	2.05	2.47	2.83	3.14	3.39	3.60	3.78	3.96	4.12	4.26	4.39	4.49	4.55	4.55
160	0.42	0.38	0.37	0.39	0.35	0.40	0.56	1.11	1.74	2.33	2.61	2.79	2.91	3.05	3.17	3.26	3.33	3.38	3.41	3.41
165	0.37	0.37	0.36	0.35	0.30	0.27	0.31	0.49	0.75	1.04	1.38	1.71	2.00	2.14	2.23	2.27	2.32	2.35	2.36	2.36
170	0.35	0.35	0.34	0.33	0.32	0.31	0.29	0.28	0.27	0.26	0.25	0.24	0.24	0.25	0.29	0.36	0.56	0.76	0.90	0.90
175	0.37	0.37	0.37	0.36	0.35	0.35	0.34	0.33	0.32	0.32	0.31	0.30	0.29	0.28	0.28	0.27	0.27	0.27	0.27	0.27
180	0.40	0.40	0.40	0.40	0.39	0.39	0.39	0.38	0.38	0.37	0.37	0.36	0.35	0.34	0.34	0.33	0.33	0.33	0.34	0.34

C (DEG) \ γ (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	64.1	63.9	63.7	63.5	63.4	63.2	63.1	62.9	62.7	62.6	62.5	62.4	62.3	62.2	62.1	62.0	61.9	61.8	63.6
5	268	268	268	269	270	272	275	277	274	261	242	217	183	148	114	90.9	73.5	61.7	58.1
10	451	444	432	412	390	367	353	340	327	310	292	274	267	255	235	192	134	61.6	53.9
15	831	816	791	758	717	669	606	540	475	419	370	330	315	302	279	225	153	62.1	45.0
20	1027	1016	995	960	917	870	831	785	726	627	523	425	373	330	287	221	146	62.1	36.9
25	1251	1245	1231	1210	1177	1128	1044	946	843	751	660	570	478	388	300	217	137	60.3	42.0
30	1006	1018	1037	1075	1110	1135	1133	1105	1048	932	796	651	526	408	300	207	127	57.9	61.8
35	828	840	858	873	893	918	976	1023	1038	960	847	712	581	449	324	221	132	55.9	77.9
40	731	739	745	739	737	745	800	855	896	886	844	772	646	502	356	243	141	52.5	79.0
45	715	705	693	678	666	660	674	694	716	751	769	754	644	506	358	245	142	49.5	68.8
50	670	667	664	664	662	657	639	622	612	649	679	681	580	450	311	211	122	43.9	55.6
55	676	665	652	638	623	609	597	587	579	592	596	581	504	406	300	211	123	38.5	47.0
60	668	662	652	642	628	612	589	565	540	529	513	485	422	346	263	188	112	35.0	39.6
65	665	657	646	633	617	598	578	555	527	494	455	409	351	287	220	157	93.2	29.2	31.2
70	649	644	635	624	609	590	568	540	506	462	411	355	289	223	159	107	62.4	24.3	23.6
75	634	629	620	604	584	561	540	514	481	437	384	326	254	182	116	71.4	38.7	18.3	16.6
80	526	525	524	520	515	505	494	477	450	406	353	293	222	153	91.3	51.0	24.1	10.7	9.21
85	281	282	282	284	286	287	289	289	285	277	262	236	182	123	67.8	35.2	14.4	5.27	5.11
90	122	122	122	122	122	120	118	115	111	108	103	94.4	75.7	54.9	34.6	20.8	10.2	2.59	2.69
95	68.0	67.9	67.4	66.7	65.6	63.8	60.7	57.1	53.3	50.6	47.3	42.9	34.6	25.6	16.8	10.7	5.71	2.00	2.08
100	52.9	52.6	52.1	51.6	50.6	49.0	46.2	42.7	38.7	34.3	29.8	25.1	20.3	15.6	11.3	7.71	4.63	2.06	1.95
105	41.8	41.5	40.7	38.9	36.5	33.7	30.1	26.4	22.9	20.8	18.9	17.0	14.1	11.0	8.07	5.66	3.55	1.72	1.65
110	24.7	24.7	24.5	24.2	23.6	22.7	21.1	19.2	17.3	16.1	14.8	13.4	11.2	8.77	6.40	4.53	2.91	1.53	1.46
115	20.9	20.8	20.5	19.7	18.6	17.4	16.4	15.4	14.4	13.6	12.6	11.3	9.31	7.16	5.08	3.54	2.27	1.28	1.26
120	16.7	16.7	16.5	16.0	15.3	14.7	14.6	14.4	13.9	12.5	10.8	8.99	7.25	5.59	4.07	2.85	1.85	1.06	1.13
125	15.0	15.1	15.3	15.4	15.3	15.0	14.4	13.4	12.2	10.6	8.93	7.24	5.79	4.46	3.28	2.31	1.52	0.89	1.05
130	16.4	16.6	16.7	16.3	15.6	14.6	12.8	10.8	8.86	7.73	6.80	5.96	4.85	3.76	2.76	1.97	1.32	0.81	0.95
135	15.2	14.7	13.9	12.6	11.2	9.82	8.73	7.77	6.92	6.23	5.59	4.94	4.07	3.18	2.35	1.70	1.17	0.74	0.81
140	9.61	9.43	9.13	8.68	8.15	7.56	6.97	6.36	5.75	5.18	4.60	4.00	3.27	2.54	1.87	1.37	0.96	0.66	0.77
145	7.49	7.38	7.20	6.96	6.65	6.27	5.79	5.27	4.73	4.29	3.83	3.29	2.44	1.59	0.87	0.54	0.44	0.58	0.67
150	6.14	6.04	5.88	5.65	5.36	5.03	4.64	4.24	3.82	3.48	3.10	2.66	1.93	1.20	0.59	0.34	0.32	0.52	0.60
155	4.49	4.39	4.26	4.12	3.96	3.78	3.60	3.39	3.14	2.83	2.47	2.05	1.48	0.93	0.48	0.30	0.29	0.46	0.55
160	3.38	3.33	3.26	3.17	3.05	2.91	2.79	2.61	2.33	1.74	1.11	0.56	0.40	0.35	0.39	0.37	0.38	0.42	0.50
165	2.35	2.32	2.27	2.23	2.14	2.00	1.71	1.38	1.04	0.75	0.49	0.31	0.27	0.30	0.35	0.36	0.37	0.37	0.44
170	0.76	0.86	0.36	0.29	0.25	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.31	0.32	0.33	0.34	0.35	0.35	0.41
175	0.27	0.27	0.27	0.28	0.28	0.29	0.30	0.31	0.32	0.32	0.33	0.34	0.35	0.35	0.36	0.37	0.37	0.37	0.41
180	0.34	0.34	0.33	0.33	0.34	0.34	0.35	0.36	0.37	0.37	0.38	0.38	0.39	0.39	0.40	0.40	0.40	0.40	0.44

Table--3

UNIT: ×10^{od}

C (DEG) y (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	65.0	65.9	66.1	66.1	65.8	65.8	65.7	65.7	65.6	65.5	65.3	65.1	64.9	64.7	64.6	64.5	64.3	64.5	64.6
5	54.6	51.2	48.0	44.9	41.9	38.9	36.1	33.5	31.3	29.5	28.2	27.7	27.5	27.6	27.8	27.9	28.0	27.9	27.8
10	47.0	41.0	34.5	29.8	27.9	31.1	37.7	47.5	62.6	78.8	94.4	105	113	119	124	128	129	128	124
15	34.6	30.7	33.6	43.0	58.6	86.6	116	142	151	154	151	144	135	124	113	104	98.7	104	113
20	26.0	29.3	58.1	92.7	125	133	131	122	104	85.0	68.4	68.1	72.1	77.4	76.5	74.8	73.2	74.8	76.5
25	35.8	41.9	73.0	107	133	122	101	76.3	66.3	59.3	54.2	48.7	44.2	41.0	39.7	39.4	39.7	39.4	39.7
30	65.9	70.3	77.4	82.9	85.2	76.9	65.9	54.5	48.2	43.7	41.0	40.6	41.2	42.1	41.7	41.3	41.0	41.3	41.7
35	92.7	100	98.4	91.1	80.1	66.4	52.7	41.2	38.9	39.2	40.3	37.5	34.3	31.2	29.3	27.9	27.3	27.9	29.3
40	95.2	101	89.9	73.2	55.3	48.8	44.6	41.2	35.0	28.8	23.2	19.5	16.8	14.9	13.6	12.9	12.7	12.9	13.6
45	80.1	83.4	74.2	60.4	45.6	38.5	33.0	28.3	22.5	17.1	12.5	9.70	7.79	6.59	5.75	5.35	5.29	5.35	5.75
50	62.3	64.0	58.2	49.2	38.6	30.4	22.7	16.1	11.5	8.12	5.71	4.11	3.16	2.67	2.32	2.20	2.24	2.20	2.32
55	51.5	51.7	45.6	37.0	27.4	20.3	14.1	9.07	6.09	4.19	3.06	2.13	1.57	1.29	1.13	1.09	1.14	1.09	1.13
60	41.2	39.8	33.3	25.3	17.1	12.1	8.24	5.37	3.55	2.43	1.78	1.19	0.82	0.62	0.51	0.49	0.52	0.49	0.51
65	31.1	28.9	23.0	16.2	9.66	6.55	4.56	3.35	2.33	1.68	1.26	0.81	0.49	0.27	0.19	0.18	0.21	0.18	0.19
70	21.9	19.3	14.9	10.3	6.05	4.19	3.13	2.57	1.89	1.39	1.00	0.63	0.35	0.15	0.10	0.11	0.15	0.11	0.10
75	14.6	12.4	9.46	6.57	4.08	3.01	2.45	1.81	1.72	1.32	0.99	0.68	0.42	0.24	0.20	0.21	0.25	0.21	0.20
80	7.84	6.55	5.29	4.16	3.22	2.67	2.29	2.00	1.62	1.27	0.96	0.69	0.49	0.34	0.31	0.32	0.35	0.32	0.31
85	4.84	4.45	3.84	3.20	2.60	2.25	1.97	1.74	1.44	1.16	0.90	0.70	0.54	0.43	0.41	0.42	0.44	0.42	0.41
90	2.70	2.63	2.42	2.17	1.90	1.73	1.57	1.41	1.20	1.00	0.81	0.68	0.58	0.52	0.51	0.51	0.53	0.51	0.51
95	2.09	2.02	1.83	1.61	1.38	1.27	1.17	1.08	0.94	0.81	0.69	0.63	0.59	0.58	0.57	0.58	0.59	0.58	0.57
100	1.83	1.70	1.52	1.34	1.18	1.09	1.01	0.94	0.84	0.75	0.67	0.64	0.62	0.62	0.62	0.63	0.63	0.63	0.62
105	1.57	1.47	1.34	1.20	1.07	1.00	0.95	0.90	0.82	0.75	0.68	0.66	0.65	0.65	0.65	0.66	0.66	0.66	0.65
110	1.39	1.31	1.20	1.10	1.00	0.95	0.90	0.86	0.79	0.73	0.67	0.65	0.65	0.65	0.65	0.65	0.66	0.65	0.65
115	1.23	1.18	1.10	1.01	0.93	0.89	0.85	0.82	0.77	0.71	0.66	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
120	1.16	1.15	1.08	0.98	0.89	0.85	0.83	0.81	0.76	0.70	0.66	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
125	1.14	1.16	1.09	0.97	0.86	0.83	0.81	0.80	0.76	0.72	0.68	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
130	1.03	1.06	1.01	0.93	0.84	0.81	0.80	0.78	0.76	0.73	0.71	0.70	0.71	0.71	0.71	0.71	0.71	0.71	0.71
135	0.86	0.89	0.87	0.84	0.81	0.79	0.77	0.75	0.73	0.72	0.71	0.71	0.72	0.73	0.74	0.74	0.74	0.74	0.74
140	0.83	0.87	0.85	0.80	0.75	0.73	0.72	0.70	0.70	0.69	0.69	0.70	0.72	0.73	0.73	0.74	0.74	0.74	0.73
145	0.73	0.76	0.75	0.72	0.69	0.67	0.66	0.65	0.65	0.66	0.66	0.68	0.69	0.71	0.71	0.72	0.72	0.72	0.71
150	0.66	0.69	0.69	0.67	0.65	0.63	0.62	0.61	0.62	0.63	0.64	0.65	0.66	0.66	0.67	0.68	0.68	0.68	0.67
155	0.60	0.64	0.64	0.63	0.60	0.59	0.59	0.58	0.59	0.59	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.60	0.60
160	0.56	0.59	0.59	0.58	0.56	0.57	0.57	0.58	0.58	0.57	0.57	0.57	0.56	0.55	0.54	0.53	0.52	0.53	0.54
165	0.50	0.53	0.54	0.53	0.52	0.53	0.54	0.54	0.53	0.52	0.51	0.49	0.48	0.46	0.45	0.43	0.42	0.43	0.45
170	0.45	0.47	0.48	0.47	0.46	0.46	0.46	0.45	0.44	0.41	0.39	0.36	0.33	0.31	0.30	0.30	0.30	0.30	0.30
175	0.43	0.45	0.45	0.45	0.44	0.44	0.43	0.42	0.40	0.38	0.36	0.34	0.33	0.32	0.31	0.32	0.32	0.32	0.31
180	0.39	0.39	0.39	0.39	0.39	0.39	0.40	0.40	0.39	0.38	0.37	0.36	0.35	0.34	0.34	0.33	0.33	0.33	0.34

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	64.7	64.9	65.1	65.3	65.5	65.6	65.7	65.7	65.8	65.8	66.1	66.1	65.9	65.0	63.6				
5	27.6	27.5	27.7	28.2	29.5	31.3	33.5	36.1	38.9	41.9	44.9	48.0	51.2	54.6	58.1				
10	119	113	105	94.4	78.8	62.6	47.5	37.7	31.1	27.9	29.8	34.5	41.0	47.0	53.9				
15	124	135	144	151	154	151	142	116	86.6	58.6	43.0	33.6	30.7	34.6	45.0				
20	77.4	72.1	68.1	68.4	85.0	104	122	131	133	125	92.7	58.1	29.3	26.0	36.9				
25	41.0	44.2	48.7	54.2	59.3	66.3	76.3	101	122	133	107	73.0	41.9	35.8	42.0				
30	42.1	41.2	40.6	41.0	43.7	48.2	54.5	65.9	76.9	85.2	82.9	77.4	70.3	65.9	61.8				
35	31.2	34.3	37.5	40.3	39.2	38.9	41.2	52.7	66.4	80.1	91.1	98.4	100	92.7	77.9				
40	14.9	16.8	19.5	23.2	28.8	35.0	41.2	44.6	48.8	55.3	73.2	89.9	101	95.2	79.0				
45	6.59	7.79	9.70	12.5	17.1	22.5	28.3	33.0	38.5	45.6	60.4	74.2	83.4	80.1	68.8				
50	2.67	3.16	4.11	5.71	8.12	11.5	16.1	22.7	30.4	38.6	49.2	58.2	64.0	62.3	55.6				
55	1.29	1.57	2.13	3.06	4.19	6.09	9.07	14.1	20.3	27.4	37.0	45.6	51.7	51.5	47.0				
60	0.62	0.82	1.19	1.78	2.43	3.55	5.37	8.24	12.1	17.1	25.3	33.3	39.8	41.2	39.6				
65	0.27	0.49	0.81	1.26	1.68	2.33	3.35	4.56	6.55	9.66	16.2	23.0	28.9	31.1	31.2				
70	0.15	0.35	0.63	1.00	1.39	1.89	2.57	3.13	4.19	6.05	10.3	14.9	19.3	21.9	23.6				
75	0.24	0.42	0.68	0.99	1.32	1.72	2.18	2.45	3.01	4.08	6.57	9.46	12.4	14.6	16.6				
80	0.34	0.49	0.69	0.96	1.27	1.62	2.00	2.29	2.67	3.22	4.16	5.29	6.55	7.84	9.21				
85	0.43	0.54	0.70	0.90	1.16	1.44	1.74	1.97	2.25	2.60	3.20	3.84	4.45	4.84	5.11				
90	0.52	0.58	0.68	0.81	1.00	1.20	1.41	1.57	1.73	1.90	2.17	2.42	2.63	2.70	2.69				
95	0.58	0.59	0.63	0.69	0.81	0.94	1.08	1.17	1.27	1.38	1.61	1.83	2.02	2.09	2.08				
100	0.62	0.62	0.64	0.67	0.75	0.84	0.94	1.01	1.09	1.18	1.34	1.52	1.70	1.83	1.95				
105	0.65	0.65	0.66	0.68	0.75	0.82	0.90	0.95	1.00	1.07	1.20	1.34	1.47	1.57	1.65				
110	0.65	0.65	0.65	0.67	0.73	0.79	0.86	0.90	0.95	1.00	1.10	1.20	1.31	1.39	1.46				
115	0.64	0.64	0.64	0.66	0.71	0.77	0.82	0.85	0.89	0.93	1.01	1.10	1.18	1.23	1.26				
120	0.64	0.64	0.64	0.66	0.70	0.76	0.81	0.83	0.85	0.89	0.98	1.08	1.15	1.16	1.13				
125	0.67	0.67	0.67	0.68	0.72	0.76	0.80	0.81	0.83	0.86	0.97	1.09	1.16	1.14	1.05				
130	0.71	0.71	0.70	0.71	0.73	0.76	0.78	0.80	0.81	0.84	0.93	1.01	1.06	1.03	0.95				
135	0.73	0.72	0.71	0.71	0.72	0.73	0.75	0.77	0.79	0.81	0.84	0.87	0.89	0.86	0.81				
140	0.73	0.72	0.70	0.69	0.69	0.70	0.70	0.72	0.73	0.75	0.80	0.85	0.87	0.83	0.77				
145	0.71	0.69	0.68	0.66	0.66	0.65	0.65	0.66	0.67	0.69	0.72	0.75	0.76	0.73	0.67				
150	0.66	0.66	0.65	0.64	0.63	0.62	0.61	0.62	0.63	0.65	0.67	0.69	0.69	0.66	0.60				
155	0.60	0.60	0.60	0.60	0.59	0.59	0.58	0.59	0.59	0.60	0.63	0.64	0.64	0.60	0.55				
160	0.55	0.56	0.57	0.57	0.57	0.58	0.58	0.57	0.57	0.56	0.58	0.59	0.59	0.56	0.50				
165	0.46	0.48	0.49	0.51	0.52	0.53	0.54	0.54	0.53	0.52	0.53	0.54	0.53	0.50	0.44				
170	0.31	0.33	0.36	0.39	0.41	0.44	0.45	0.46	0.46	0.46	0.47	0.48	0.47	0.45	0.41				
175	0.32	0.33	0.34	0.36	0.38	0.40	0.42	0.43	0.44	0.44	0.45	0.45	0.45	0.43	0.41				
180	0.34	0.35	0.36	0.37	0.38	0.39	0.40	0.40	0.40	0.39	0.39	0.39	0.39	0.39	0.40				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34L @ 100W / 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 $25 \pm 1^{\circ}\text{C}$. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion was calculated.</p>

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD(%)
120.0	60	0.879	105.0	0.995	3.77
277.0	60	0.410	102.3	0.899	11.89

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*****