

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

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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		9588
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		147.3
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		9260
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	142.2
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		65.1
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.46
			277V	7.22
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
			277V	0.920
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5087
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		74.8
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-26
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		76
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%		6.9%
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		0.545
(Goniophotometer – Section 4.2)		Non-Worst Case		0.252
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		65.1
(Goniophotometer – Section 4.2)		Non-Worst Case		64.3

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34M @ 60W / 5000K	230612002-S1
2	Goniophotometer Test	2023-06-13	W34M @ 60W / 5000K	230612002-S1
3	THD and PF Test	2023-06-13	W34M @ 60W / 5000K	230612002-S1

Remark (If any)

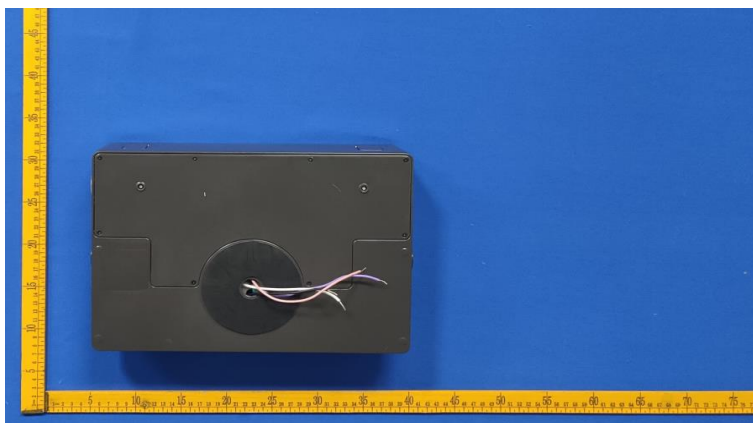
1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

3.0 Product Description

Luminaire Description: Model No. W34M @ 60W / 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.	W34M @ 60W / 5000K	Sample ID	230612002-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

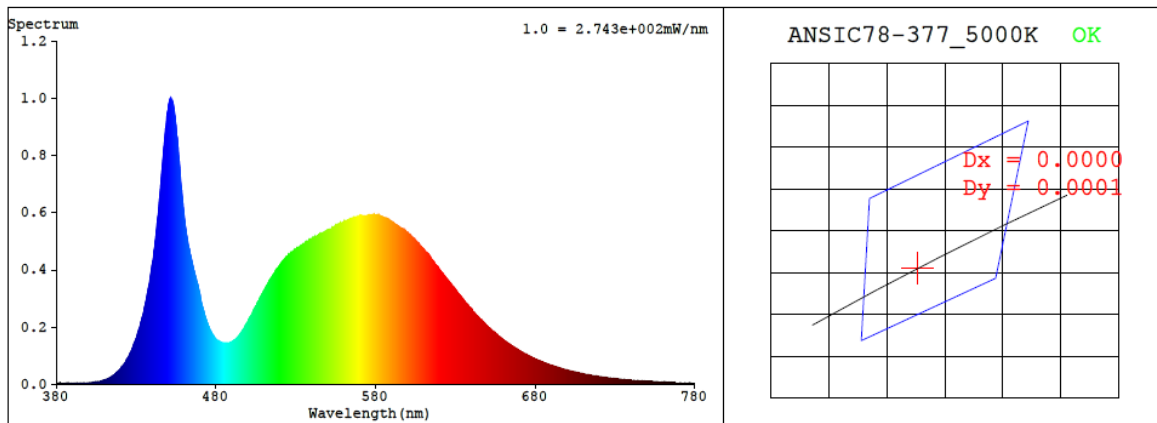
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.545	65.1	0.995
277.0	60	0.252	64.3	0.920

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5087	74.8	-26	0.0001	76	94	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3427$ $y = 0.3498$ / $u' = 0.2105$ $v' = 0.4835$ ($duv=5.69e-05$)

CCT= 5087K Prcp WL: $L_d=571.4nm$ Purity=7.8%

Peak WL: $L_p=452nm$ FWHM: $=20.4nm$ Ratio:R=14.5% G=81.7% B=3.8%

Render Index: $R_a = 74.8$ AvgR = 65.2 TM30:Rf=75 Rg=93

EEL: 0.09417 A++ Highest

R1 =72 R2 =81 R3 =86 R4 =74 R5 =73 R6 =73 R7 =82

R8 =57 R9 =-26 R10=54 R11=70 R12=48 R13=74 R14=92 R15=67

4.1 Integrating Sphere Test

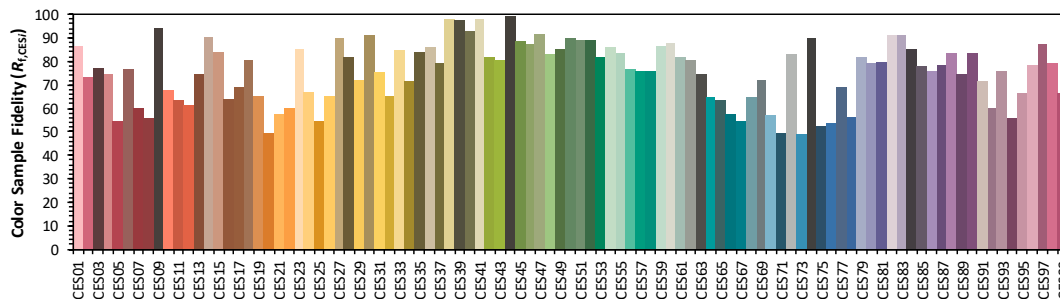
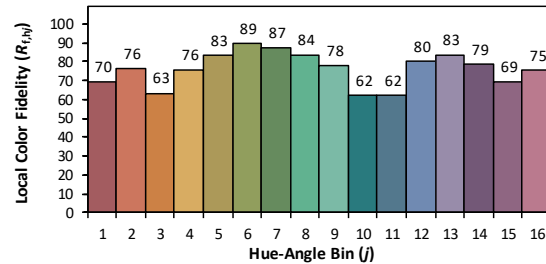
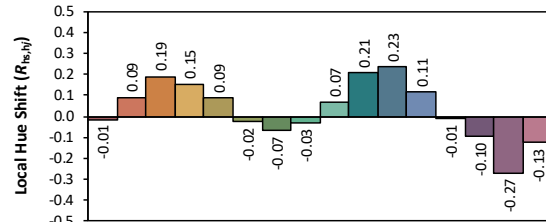
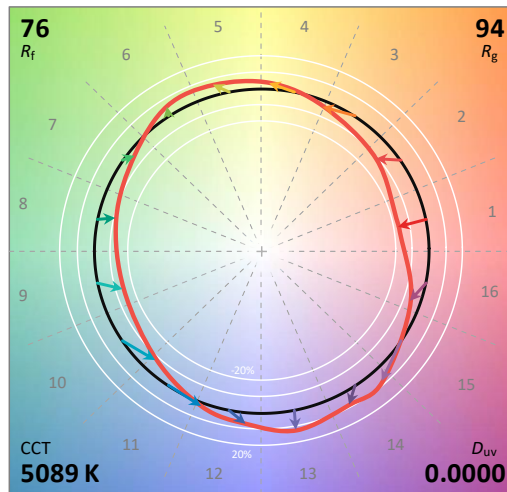
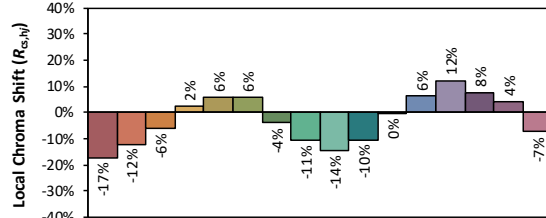
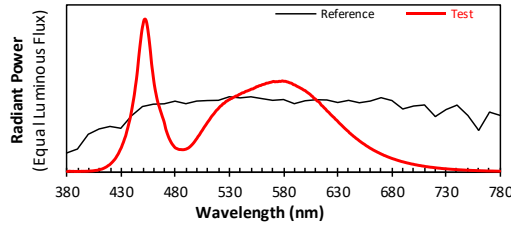
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34M @ 60W / 5000K



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

x 0.3427
 y 0.3496
 u' 0.2105
 v' 0.4833

CIE 13.3-1995
(CRI)

R_a 75
 R_g -26

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	2.70E-06	447	8.07E-04	514	3.66E-04	581	5.91E-04	648	2.15E-04	715	3.17E-05
381	3.50E-06	448	8.66E-04	515	3.74E-04	582	5.91E-04	649	2.10E-04	716	3.07E-05
382	4.70E-06	449	9.23E-04	516	3.83E-04	583	5.88E-04	650	2.04E-04	717	3.01E-05
383	3.90E-06	450	9.60E-04	517	3.93E-04	584	5.87E-04	651	1.99E-04	718	2.94E-05
384	3.50E-06	451	9.91E-04	518	4.02E-04	585	5.83E-04	652	1.93E-04	719	2.85E-05
385	3.60E-06	452	9.97E-04	519	4.08E-04	586	5.81E-04	653	1.88E-04	720	2.74E-05
386	3.90E-06	453	9.86E-04	520	4.15E-04	587	5.79E-04	654	1.84E-04	721	2.67E-05
387	2.60E-06	454	9.51E-04	521	4.24E-04	588	5.76E-04	655	1.79E-04	722	2.57E-05
388	3.60E-06	455	9.02E-04	522	4.31E-04	589	5.70E-04	656	1.74E-04	723	2.51E-05
389	2.80E-06	456	8.45E-04	523	4.35E-04	590	5.68E-04	657	1.69E-04	724	2.44E-05
390	3.10E-06	457	7.78E-04	524	4.44E-04	591	5.66E-04	658	1.65E-04	725	2.38E-05
391	3.30E-06	458	7.05E-04	525	4.47E-04	592	5.61E-04	659	1.60E-04	726	2.27E-05
392	3.10E-06	459	6.50E-04	526	4.54E-04	593	5.57E-04	660	1.56E-04	727	2.21E-05
393	4.20E-06	460	5.94E-04	527	4.61E-04	594	5.54E-04	661	1.52E-04	728	2.14E-05
394	3.80E-06	461	5.48E-04	528	4.63E-04	595	5.50E-04	662	1.48E-04	729	2.09E-05
395	4.20E-06	462	5.11E-04	529	4.69E-04	596	5.46E-04	663	1.43E-04	730	2.05E-05
396	3.80E-06	463	4.77E-04	530	4.72E-04	597	5.42E-04	664	1.40E-04	731	1.98E-05
397	4.20E-06	464	4.48E-04	531	4.78E-04	598	5.38E-04	665	1.36E-04	732	1.90E-05
398	4.50E-06	465	4.27E-04	532	4.79E-04	599	5.33E-04	666	1.33E-04	733	1.86E-05
399	4.50E-06	466	4.03E-04	533	4.84E-04	600	5.31E-04	667	1.28E-04	734	1.79E-05
400	5.40E-06	467	3.82E-04	534	4.87E-04	601	5.25E-04	668	1.26E-04	735	1.75E-05
401	5.70E-06	468	3.59E-04	535	4.91E-04	602	5.19E-04	669	1.22E-04	736	1.69E-05
402	6.20E-06	469	3.39E-04	536	4.95E-04	603	5.14E-04	670	1.18E-04	737	1.66E-05
403	6.60E-06	470	3.15E-04	537	4.96E-04	604	5.09E-04	671	1.15E-04	738	1.61E-05
404	7.40E-06	471	2.83E-04	538	5.00E-04	605	5.03E-04	672	1.12E-04	739	1.54E-05
405	8.30E-06	472	2.61E-04	539	5.05E-04	606	4.96E-04	673	1.08E-04	740	1.52E-05
406	9.50E-06	473	2.40E-04	540	5.08E-04	607	4.91E-04	674	1.06E-04	741	1.47E-05
407	1.01E-05	474	2.22E-04	541	5.12E-04	608	4.82E-04	675	1.03E-04	742	1.42E-05
408	1.12E-05	475	2.07E-04	542	5.16E-04	609	4.78E-04	676	9.96E-05	743	1.37E-05
409	1.33E-05	476	1.94E-04	543	5.17E-04	610	4.72E-04	677	9.69E-05	744	1.34E-05
410	1.49E-05	477	1.82E-04	544	5.20E-04	611	4.64E-04	678	9.42E-05	745	1.31E-05
411	1.72E-05	478	1.73E-04	545	5.25E-04	612	4.60E-04	679	9.15E-05	746	1.25E-05
412	1.86E-05	479	1.64E-04	546	5.27E-04	613	4.55E-04	680	8.88E-05	747	1.23E-05
413	2.16E-05	480	1.57E-04	547	5.30E-04	614	4.47E-04	681	8.63E-05	748	1.18E-05
414	2.47E-05	481	1.53E-04	548	5.33E-04	615	4.36E-04	682	8.40E-05	749	1.13E-05
415	2.84E-05	482	1.50E-04	549	5.35E-04	616	4.31E-04	683	8.20E-05	750	1.11E-05
416	3.20E-05	483	1.47E-04	550	5.39E-04	617	4.23E-04	684	7.93E-05	751	1.08E-05
417	3.67E-05	484	1.46E-04	551	5.41E-04	618	4.16E-04	685	7.71E-05	752	1.06E-05
418	4.22E-05	485	1.46E-04	552	5.42E-04	619	4.10E-04	686	7.48E-05	753	1.02E-05
419	4.60E-05	486	1.45E-04	553	5.47E-04	620	4.00E-04	687	7.27E-05	754	9.90E-06
420	5.24E-05	487	1.45E-04	554	5.50E-04	621	3.94E-04	688	7.06E-05	755	9.50E-06
421	5.94E-05	488	1.45E-04	555	5.56E-04	622	3.88E-04	689	6.82E-05	756	9.50E-06
422	6.66E-05	489	1.47E-04	556	5.56E-04	623	3.80E-04	690	6.66E-05	757	9.10E-06
423	7.47E-05	490	1.49E-04	557	5.60E-04	624	3.72E-04	691	6.49E-05	758	8.90E-06
424	8.28E-05	491	1.53E-04	558	5.63E-04	625	3.66E-04	692	6.30E-05	759	8.60E-06
425	9.30E-05	492	1.56E-04	559	5.64E-04	626	3.59E-04	693	6.11E-05	760	8.20E-06
426	1.05E-04	493	1.61E-04	560	5.68E-04	627	3.53E-04	694	5.93E-05	761	8.10E-06
427	1.16E-04	494	1.68E-04	561	5.70E-04	628	3.44E-04	695	5.76E-05	762	8.00E-06
428	1.30E-04	495	1.75E-04	562	5.72E-04	629	3.39E-04	696	5.61E-05	763	7.50E-06
429	1.45E-04	496	1.82E-04	563	5.74E-04	630	3.32E-04	697	5.44E-05	764	7.50E-06
430	1.59E-04	497	1.91E-04	564	5.79E-04	631	3.24E-04	698	5.25E-05	765	7.20E-06
431	1.78E-04	498	2.00E-04	565	5.79E-04	632	3.16E-04	699	5.11E-05	766	7.00E-06
432	1.95E-04	499	2.10E-04	566	5.80E-04	633	3.10E-04	700	5.02E-05	767	6.70E-06
433	2.17E-04	500	2.19E-04	567	5.83E-04	634	3.03E-04	701	4.83E-05	768	6.40E-06
434	2.36E-04	501	2.31E-04	568	5.84E-04	635	2.96E-04	702	4.67E-05	769	6.30E-06
435	2.63E-04	502	2.40E-04	569	5.86E-04	636	2.89E-04	703	4.57E-05	770	6.20E-06
436	2.89E-04	503	2.51E-04	570	5.89E-04	637	2.82E-04	704	4.41E-05	771	6.10E-06
437	3.19E-04	504	2.63E-04	571	5.90E-04	638	2.76E-04	705	4.28E-05	772	5.80E-06
438	3.46E-04	505	2.72E-04	572	5.88E-04	639	2.69E-04	706	4.16E-05	773	5.90E-06
439	3.81E-04	506	2.84E-04	573	5.89E-04	640	2.64E-04	707	4.08E-05	774	5.60E-06
440	4.20E-04	507	2.95E-04	574	5.89E-04	641	2.55E-04	708	3.92E-05	775	5.40E-06
441	4.61E-04	508	3.05E-04	575	5.89E-04	642	2.50E-04	709	3.82E-05	776	5.20E-06
442	5.03E-04	509	3.16E-04	576	5.91E-04	643	2.43E-04	710	3.72E-05	777	5.10E-06
443	5.57E-04	510	3.26E-04	577	5.90E-04	644	2.38E-04	711	3.56E-05	778	4.90E-06
444	6.07E-04	511	3.35E-04	578	5.92E-04	645	2.31E-04	712	3.45E-05	779	4.80E-06
445	6.69E-04	512	3.46E-04	579	5.94E-04	646	2.27E-04	713	3.38E-05	780	4.80E-06
446	7.41E-04	513	3.57E-04	580	5.92E-04	647	2.20E-04	714	3.27E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34M @ 60W / 5000K	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	120.0	60	0.545	65.1	0.995
NON-WORST CASE	277.0	60	0.252	64.3	0.920

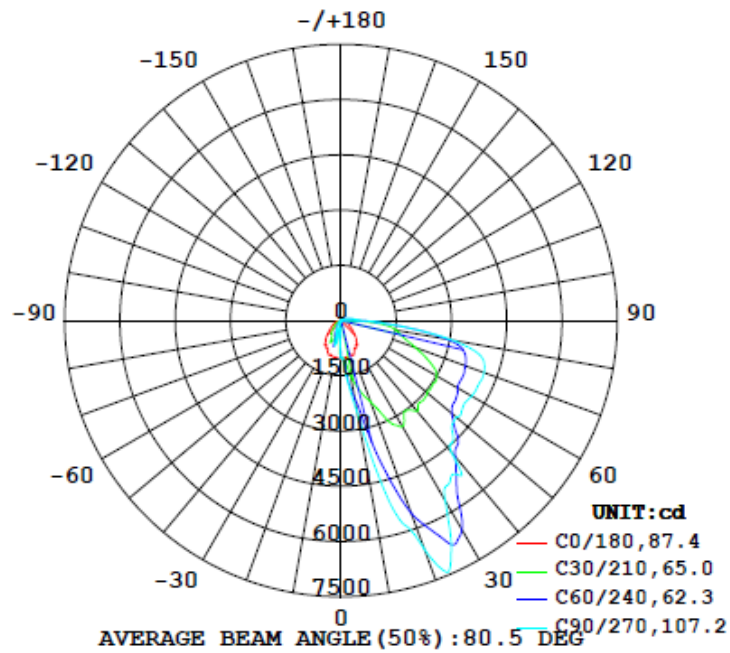
Test Result

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	9588	90.8	123.8	63.8	61.4	147.3	6.7%	B1-U3-G4
0°-90° zones	9260	90.8	123.8	63.8	61.4	142.2	6.9%	B1-U3-G4

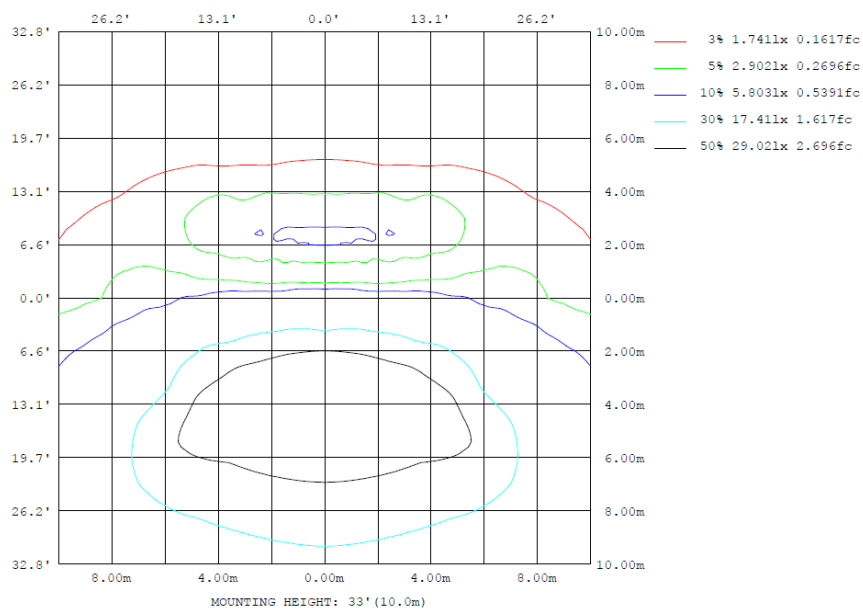
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

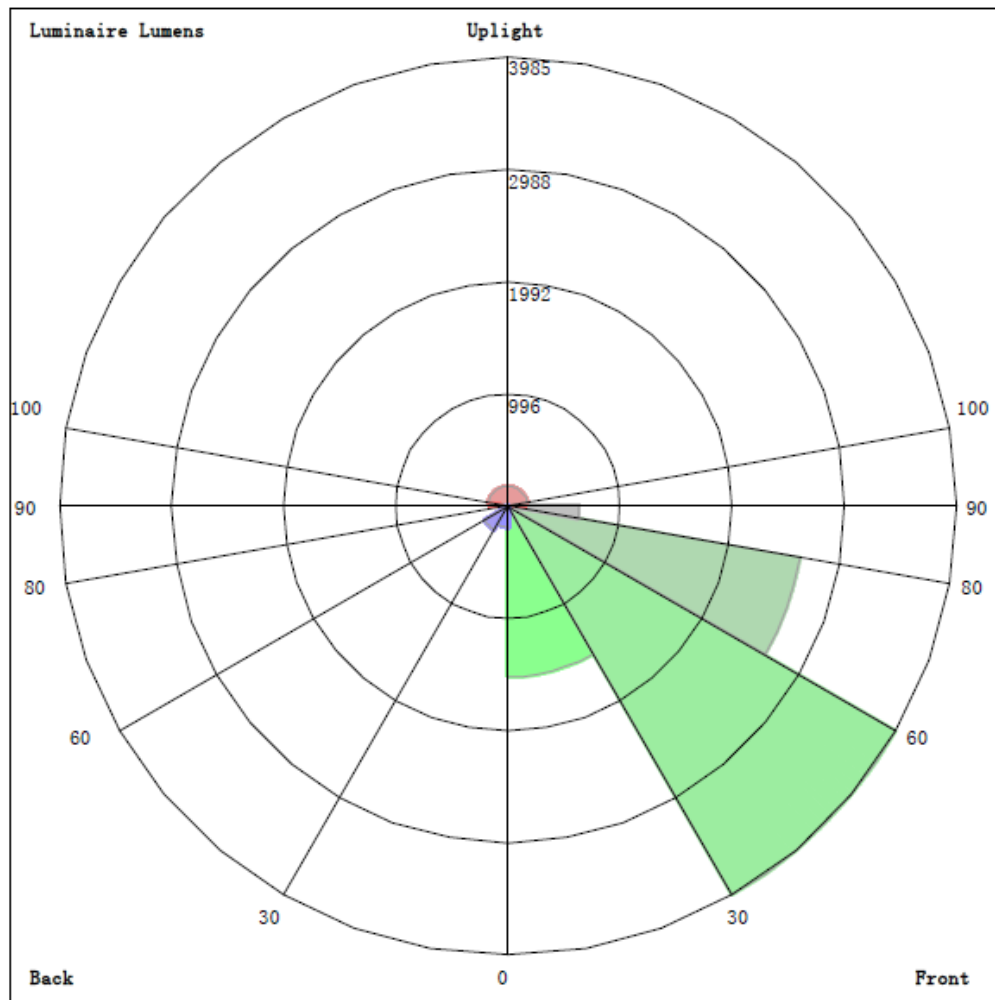
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	zone	total	lum, lamp
10	1029	1902	2515	1902	1029	239.4	464.4	239.4	0- 10	87.37	87.37	0.91,0.91
20	990.8	3782	6583	3782	990.8	697.3	356.4	697.3	10- 20	490.9	578.3	6.03,6.03
30	786.7	5639	5655	5639	786.7	402.5	184.2	402.5	20- 30	1122	1700	17.7,17.7
40	644.4	5672	4652	5672	644.4	228.1	66.55	228.1	30- 40	1392	3092	32.2,32.2
50	406.1	4149	4089	4149	406.1	93.51	12.51	93.51	40- 50	1434	4526	47.2,47.2
60	263.7	3263	4095	3263	263.7	39.20	2.978	39.20	50- 60	1402	5928	61.8,61.8
70	164.5	3045	4129	3045	164.5	21.72	0.8365	21.72	60- 70	1399	7327	76.4,76.4
80	60.81	2728	3068	2728	60.81	16.20	2.029	16.20	70- 80	1290	8616	89.9,89.9
90	18.25	570.3	613.3	570.3	18.25	11.06	3.202	11.06	80- 90	643.5	9260	96.6,96.6
100	12.65	204.8	317.0	204.8	12.65	6.071	3.851	6.071	90-100	151.8	9412	98.2,98.2
110	9.684	99.89	141.5	99.89	9.684	5.524	3.994	5.524	100-110	72.11	9484	98.9,98.9
120	7.430	81.17	102.6	81.17	7.430	5.186	3.929	5.186	110-120	40.87	9525	99.3,99.3
130	5.828	57.09	83.31	57.09	5.828	4.950	4.387	4.950	120-130	28.58	9553	99.6,99.6
140	4.518	32.40	69.88	32.40	4.518	4.403	4.502	4.403	130-140	19.95	9573	99.8,99.8
150	3.479	18.02	33.05	18.02	3.479	3.822	4.076	3.822	140-150	9.201	9582	99.9,99.9
160	2.631	8.658	14.75	8.658	2.631	3.515	3.004	3.515	150-160	3.992	9586	100,100
170	2.089	1.558	1.617	1.558	2.089	2.579	1.792	2.579	160-170	1.130	9588	100,100
180	2.384	2.159	1.964	2.159	2.384	2.277	1.929	2.277	170-180	0.1916	9588	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

	Zonal (lm)		Total (lm)	Percent
0-10	87.37	0-10	87.37	0.91%
10-20	490.88	0-20	578.25	6.03%
20-30	1122.10	0-30	1700.35	17.74%
30-40	1391.68	0-40	3092.03	32.25%
40-50	1434.00	0-50	4526.03	47.21%
50-60	1401.55	0-60	5927.58	61.83%
60-70	1399.13	0-70	7326.71	76.42%
70-80	1289.67	0-80	8616.38	89.87%
80-90	643.48	0-90	9259.86	96.58%
90-100	151.82	0-100	9411.68	98.17%
100-110	72.11	0-110	9483.79	98.92%
110-120	40.87	0-120	9524.66	99.34%
120-130	28.58	0-130	9553.24	99.64%
130-140	19.95	0-140	9573.19	99.85%
140-150	9.20	0-150	9582.39	99.95%
150-160	3.99	0-160	9586.38	99.99%
160-170	1.13	0-170	9587.51	100.00%
170-180	0.19	0-180	9587.70	100.00%

4.2 Goniophotometer Test

LCS/BUG

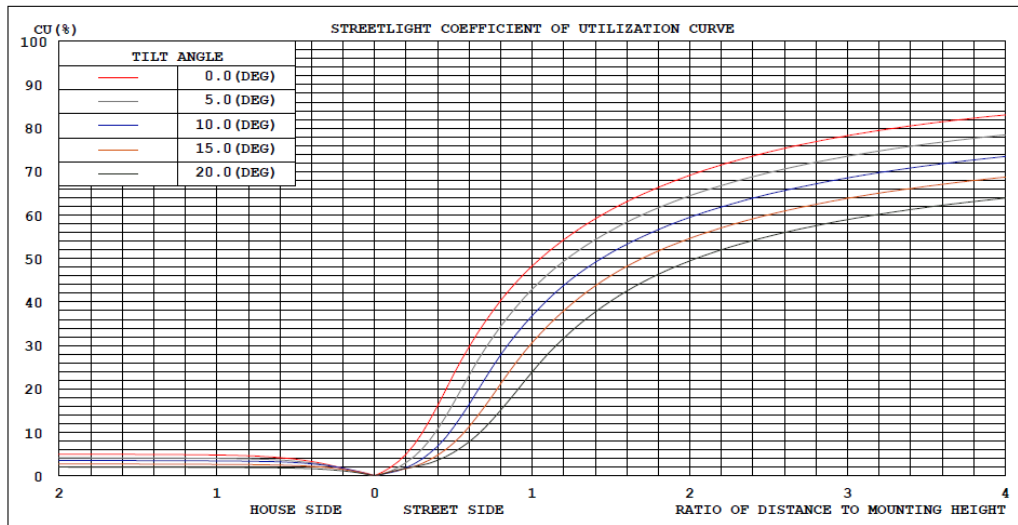


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

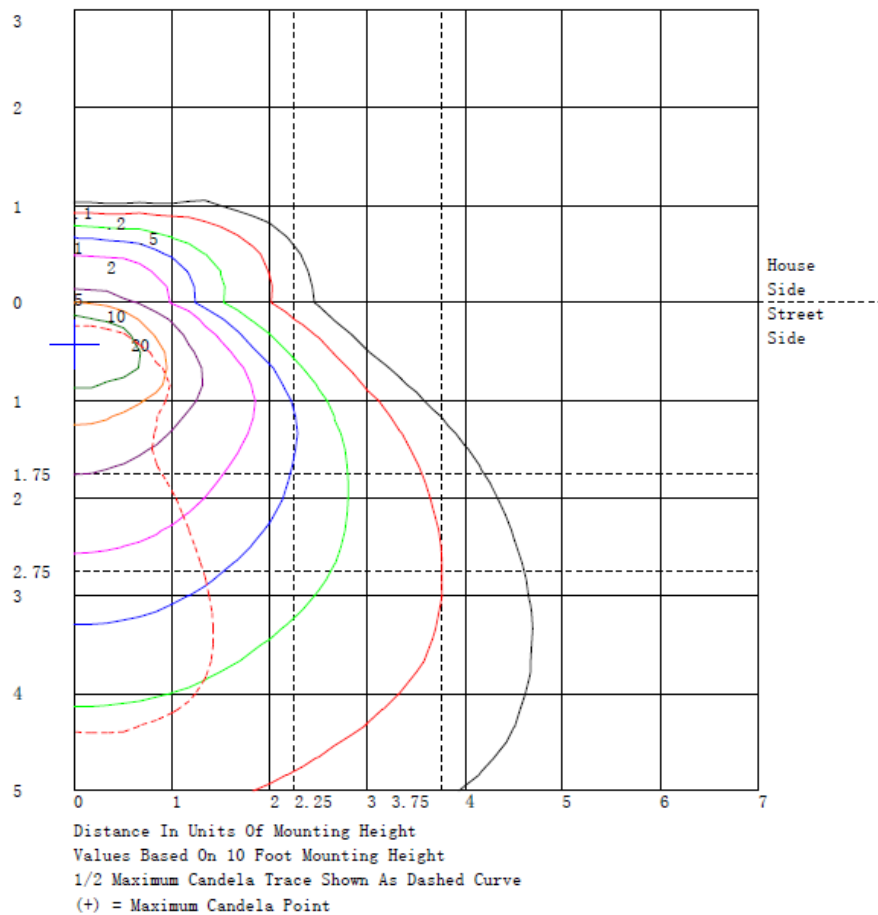
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1516.6	N.A.	15.8
FM - Front-Medium (30-60)	3984.7	N.A.	41.6
FH - Front-High (60-80)	2636.4	N.A.	27.5
FVH - Front-Very High (80-90)	633.9	N.A.	6.6
BL - Back-Low (0-30)	183.8	N.A.	1.9
BM - Back-Medium (30-60)	242.6	N.A.	2.5
BH - Back-High (60-80)	52.4	N.A.	0.5
BVH - Back-Very High (80-90)	9.6	N.A.	0.1
UL - Uplight-Low (90-100)	151.8	N.A.	1.6
UH - Uplight-High (100-180)	176.0	N.A.	1.8
Total	9587.8	N.A.	100.0
BUG Rating	B1-U3-G4		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

C (DEG)																			UNIT: cd										
γ (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90										
0	1010	1011	1012	1012	1012	1013	1013	1014	1014	1014	1014	1014	1014	1014	1014	1014	1015	1016	1017										
5	1033	1015	1007	1008	1020	1041	1069	1108	1151	1194	1232	1267	1299	1329	1354	1376	1394	1408	1416										
10	1029	1014	1038	1101	1224	1371	1527	1661	1788	1902	1993	2073	2148	2228	2305	2374	2438	2487	2515										
15	999	1068	1174	1316	1516	1738	1966	2134	2319	2546	2914	3319	3732	4101	4434	4716	4920	5055	5117										
20	991	1216	1441	1666	1854	2070	2343	2759	3244	3782	4405	5013	5555	5878	6107	6268	6428	6536	6583										
25	846	1143	1463	1807	2150	2534	2977	3562	4192	4834	5459	6033	6523	6836	7044	7158	7162	7119	7062										
30	787	1043	1366	1756	2206	2728	3327	4121	4917	5639	6108	6418	6561	6428	6194	5929	5792	5699	5655										
35	756	1076	1418	1784	2099	2492	3016	4048	5079	5924	5971	5778	5475	5372	5291	5234	5207	5197	5195										
40	644	988	1366	1777	2186	2656	3213	4133	5006	5672	5547	5215	4833	4845	4913	4982	4869	4745	4621										
45	525	948	1373	1801	2215	2644	3103	3738	4329	4787	4803	4678	4490	4424	4372	4332	4298	4276	4273										
50	406	770	1165	1590	2078	2573	3051	3504	3882	4149	4140	4045	3926	3942	3982	4003	4057	4078	4089										
55	326	568	894	1305	1896	2500	3044	3320	3495	3599	3686	3745	3790	3854	3914	3967	4008	4037	4052										
60	264	442	731	1130	1767	2418	2989	3472	3843	4154	4363	4525	4650	4735	4782	4815	4839	4859	4874										
65	212	341	582	934	1508	2110	2656	2892	3037	3137	3309	3437	3638	3787	3916	4020	4080	4112	4114										
70	164	239	417	697	1154	1659	2156	2504	2798	3045	3253	3433	3591	3762	3911	4032	4096	4127	4129										
75	108	156	294	521	878	1295	1744	2191	2613	2980	3196	3354	3480	3640	3783	3897	3953	3978	3975										
80	60.8	97.6	217	418	733	1107	1517	1964	2382	2728	2858	2910	2919	2972	3017	3051	3065	3070	3068										
85	35.7	75.9	170	317	555	818	1080	1292	1462	1577	1570	1524	1465	1466	1475	1489	1492	1495	1497										
90	18.2	45.3	87.5	145	229	320	408	478	533	570	570	559	547	560	579	597	605	611	613										
95	13.4	27.2	48.8	77.9	119	165	211	254	292	321	329	331	331	345	361	375	381	384	385										
100	12.7	23.8	38.3	56.3	79.3	105	131	157	182	205	222	238	253	272	289	304	312	316	317										
105	11.7	21.9	33.2	45.6	59.9	74.8	89.6	103	116	128	138	149	161	178	196	212	220	225	226										
110	9.68	16.5	24.4	33.6	44.7	56.5	68.4	79.8	90.4	99.9	107	113	118	126	133	138	141	141	141										
115	8.56	14.8	21.7	29.2	37.5	46.4	55.9	66.9	77.6	87.2	92.8	97.3	101	107	113	117	118	118	118										
120	7.43	13.2	19.1	25.2	30.7	37.0	44.5	57.3	70.1	81.2	84.2	85.2	85.9	90.8	96.1	101	102	103	103										
125	6.47	10.8	15.5	20.4	25.1	30.6	37.1	47.3	57.9	67.7	73.6	78.0	81.3	84.3	86.5	88.0	88.4	88.4	88.2										
130	5.83	7.94	11.0	15.1	20.2	26.2	33.0	40.7	48.7	57.1	66.3	74.7	81.6	84.2	85.0	84.7	84.4	83.8	83.3										
135	5.20	5.67	7.59	11.0	16.6	23.0	29.8	35.2	40.5	46.0	52.4	59.3	66.4	74.8	82.5	88.4	88.9	87.7	85.9										
140	4.52	4.07	5.21	7.93	13.5	19.7	25.6	28.2	30.3	32.4	36.3	40.8	45.6	50.4	55.1	59.6	64.1	67.7	69.9										
145	3.98	2.54	2.71	4.49	9.15	14.5	19.5	21.2	22.3	23.5	27.0	30.7	34.3	36.4	37.9	39.1	40.6	41.9	42.7										
150	3.48	2.51	2.50	3.46	5.95	8.99	12.1	14.1	16.0	18.0	21.4	24.8	27.7	28.9	29.5	29.9	31.1	32.3	33.1										
155	3.03	2.53	2.49	2.88	3.78	5.08	6.76	8.82	11.2	13.7	16.8	19.7	22.0	22.2	21.9	21.3	21.6	22.0	22.3										
160	2.63	2.55	2.49	2.46	2.15	2.09	2.49	4.22	6.36	8.66	10.7	12.4	13.9	14.5	14.8	14.8	14.8	14.8	14.7										
165	2.24	2.22	2.19	2.13	1.98	1.86	1.83	1.95	2.24	2.77	3.81	4.98	6.13	6.91	7.53	7.99	8.29	8.47	8.58										
170	2.09	2.05	2.01	1.96	1.90	1.83	1.76	1.69	1.62	1.56	1.50	1.44	1.40	1.35	1.33	1.34	1.42	1.52	1.62										
175	2.20	2.18	2.16	2.13	2.10	2.06	2.02	1.97	1.93	1.88	1.83	1.78	1.73	1.69	1.66	1.63	1.60	1.59	1.61										
180	2.38	2.38	2.37	2.35	2.33	2.30	2.27	2.23	2.20	2.16	2.11	2.06	2.02	1.98	1.95	1.94	1.94	1.94	1.96										

C (DEG)		UNIT: cd																		
γ (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	
0	1016	1015	1014	1014	1014	1014	1014	1014	1014	1014	1014	1013	1013	1012	1012	1012	1011	1010	1013	
5	1408	1394	1376	1354	1329	1299	1267	1232	1194	1151	1108	1069	1041	1020	1008	1007	1015	1033	965	
10	2487	2438	2374	2305	2228	2148	2073	1993	1902	1788	1661	1527	1371	1224	1101	1038	1014	1029	744	
15	5055	4920	4716	4434	4101	3732	3319	2914	2546	2319	2134	1966	1738	1516	1316	1174	1068	999	652	
20	6536	6428	6268	6107	5878	5555	5013	4405	3782	3244	2759	2343	2070	1854	1666	1441	1216	991	614	
25	7119	7162	7158	7044	6836	6523	6033	5459	4834	4192	3562	2977	2534	2150	1807	1463	1143	846	535	
30	5699	5792	5929	6194	6428	6561	6418	6108	5639	4917	4121	3327	2728	2206	1756	1366	1043	787	579	
35	5197	5207	5234	5291	5372	5475	5778	5971	5924	5079	4048	3016	2492	2099	1784	1418	1076	756	621	
40	4745	4869	4982	4913	4845	4833	5215	5547	5672	5006	4133	3213	2656	2186	1777	1366	988	644	593	
45	4276	4298	4332	4372	4424	4490	4678	4803	4787	4329	3738	3103	2644	2215	1801	1373	948	525	532	
50	4078	4057	4030	3982	3942	3926	4045	4140	4149	3882	3504	3051	2573	2078	1590	1165	770	406	416	
55	4037	4008	3967	3914	3854	3790	3745	3686	3599	3495	3320	3044	2500	1896	1305	894	568	326	334	
60	4069	4017	3945	3862	3765	3655	3525	3392	3263	3243	3172	2989	2418	1767	1130	731	442	264	275	
65	4112	4080	4020	3916	3787	3638	3477	3309	3137	3037	2892	2656	2110	1508	934	582	341	212	216	
70	4127	4096	4032	3911	3762	3591	3433	3253	3045	2798	2504	2156	1659	1154	697	417	239	164	155	
75	3978	3953	3897	3783	3640	3480	3354	3196	2980	2613	2191	1744	1295	878	521	294	156	108	97.1	
80	3070	3065	3051	3017	2972	2919	2910	2858	2728	2382	1964	1517	1107	733	418	217	97.6	60.8	57.9	
85	1495	1492	1489	1475	1466	1465	1524	1570	1577	1462	1292	1080	818	555	317	170	75.9	35.7	38.1	
90	611	605	597	579	560	547	559	570	570	533	478	408	320	229	145	87.5	45.3	18.2	20.5	
95	384	381	375	361	345	331	331	329	321	292	254	211	165	119	77.9	48.8	27.2	13.4	14.2	
100	316	312	304	289	272	253	238	222	205	182	157	131	105	79.3	56.3	38.3	23.8	12.7	12.2	
105	225	220	212	196	178	161	149	138	128	116	103	89.6	74.8	59.9	45.6	33.2	21.9	11.7	11.1	
110	141	141	138	133	126	118	113	107	99.9	90.4	79.8	68.4	56.5	44.7	33.6	24.4	16.5	9.68	9.59	
115	118	118	117	113	107	101	97.3	92.8	87.2	77.6	66.9	55.9	46.4	37.5	29.2	21.7	14.8	8.56	8.81	
120	103	102	101	96.1	90.8	85.9	85.2	84.2	81.2	70.1	57.3	44.5	37.0	30.7	25.2	19.1	13.2	7.43	8.83	
125	88.4	88.4	88.0	86.5	84.3	81.3	78.0	73.6	67.7	57.9	47.3	37.1	30.6	25.1	20.4	15.5	10.8	6.47	7.76	
130	83.8	84.4	84.7	85.0	84.2	81.6	74.7	66.3	57.1	48.7	40.7	33.0	26.2	20.2	15.1	11.0	7.94	5.83	6.10	
135	87.7	88.9	88.4	82.5	74.8	66.4	59.3	52.4	46.0	40.5	35.2	29.8	23.0	16.6	11.0	7.59	5.67	5.20	5.62	
140	67.7	64.1	59.6	55.1	50.4	45.6	40.8	36.3	32.4	30.3	28.2	25.6	19.7	13.5	7.93	5.21	4.07	4.52	4.86	
145	41.0	40.6	39.1	37.9	36.4	34.3	30.7	27.0	23.5	22.3	21.2	19.5	14.5	9.15	4.49	2.71	2.54	3.98	4.40	
150	32.3	31.1	29.9	29.5	28.9	27.7	24.8	21.4	18.0	16.0	14.1	12.1	8.99	5.95	3.46	2.50	2.51	3.48	3.96	
155	22.0	21.6	21.3	21.9	22.2	22.0	19.7	16.8	13.7	11.2	8.82	6.78	3.88	2.78	2.49	2.49	2.53	3.03	3.53	
160	14.8	14.8	14.8	14.8	14.5	13.9	12.4	10.7	8.66	6.36	4.22	2.49	2.09	2.15	2.46	2.49	2.55	2.63	3.14	
165	8.47	8.29	7.99	7.53	6.91	6.13	4.98	3.81	2.77	2.24	1.95	1.83	1.86	1.98	2.13	2.19	2.22	2.24	2.72	
170	1.52	1.42	1.34	1.33	1.35	1.40	1.44	1.50	1.56	1.62	1.69	1.76	1.83	1.90	1.96	2.01	2.05	2.09	2.46	
175	1.59	1.60	1.63	1.66	1.69	1.73	1.78	1.83	1.88	1.93	1.97	2.02	2.06	2.10	2.13	2.16	2.18	2.20	2.42	
180	1.94	1.94	1.94	1.95	1.98	2.02	2.06	2.11	2.16	2.20	2.23	2.27	2.30	2.33	2.35	2.37	2.38	2.38	2.28	

Table--3

UNIT: cd

C (DEG) γ	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	1016	1017	1017	1017	1017	1017	1017	1017	1016	1016	1015	1016	1016	1017	1017	1017	1017	1017	1017
5	882	783	650	516	396	329	285	257	238	228	224	219	216	214	212	211	211	211	212
10	519	353	265	223	214	206	215	239	287	340	388	401	406	409	431	451	464	451	431
15	398	237	200	232	310	397	492	581	624	652	669	689	700	702	677	649	629	649	677
20	356	216	254	366	510	601	668	697	630	536	441	406	387	378	366	359	356	359	366
25	336	247	347	499	642	603	524	433	404	384	368	336	305	279	271	270	272	270	271
30	436	358	385	447	510	492	453	402	356	309	266	236	213	196	187	184	184	184	187
35	519	452	439	444	451	415	369	319	268	222	184	172	168	168	161	155	152	155	161
40	544	499	460	421	381	330	278	228	188	154	126	103	84.4	71.8	66.6	65.3	66.5	65.3	66.6
45	522	494	437	371	303	253	209	169	129	94.6	66.9	52.5	44.4	40.4	36.0	33.5	32.9	33.5	36.0
50	411	390	345	291	233	182	134	93.5	66.6	47.2	33.8	24.4	18.5	15.4	13.2	12.3	12.5	12.3	13.2
55	329	310	270	222	172	127	86.8	53.7	36.2	25.7	19.8	13.6	9.52	7.05	5.91	5.72	6.14	5.72	5.91
60	272	255	215	168	120	86.8	59.9	39.2	26.6	18.6	13.8	9.00	5.70	3.66	2.78	2.65	2.98	2.65	2.78
65	210	192	155	113	73.1	52.5	38.4	29.0	20.9	15.1	10.9	6.76	3.58	1.40	0.68	0.66	1.04	0.66	0.68
70	142	125	101	76.8	54.1	40.0	29.4	21.7	16.0	11.8	8.79	5.44	2.76	0.85	0.35	0.45	0.84	0.45	0.35
75	85.7	74.3	62.0	50.1	39.2	30.8	23.9	18.2	14.0	10.7	8.07	5.29	3.02	1.38	0.97	1.05	1.38	1.05	0.97
80	54.2	49.7	44.0	37.9	31.7	26.0	20.8	16.2	12.6	9.70	7.28	5.04	3.26	2.01	1.69	1.77	2.03	1.77	1.69
85	38.8	37.9	34.5	30.0	25.2	21.2	17.5	14.1	11.2	8.75	6.64	4.88	3.53	2.60	2.37	2.43	2.64	2.43	2.37
90	21.6	21.7	20.2	18.0	15.5	14.0	12.6	11.1	9.06	7.10	5.35	4.29	3.57	3.15	3.03	3.08	3.20	3.08	3.03
95	14.5	14.2	13.0	11.4	9.82	8.77	7.83	6.95	5.90	4.93	4.13	3.75	3.57	3.51	3.50	3.53	3.58	3.53	3.50
100	11.7	11.0	10.2	9.34	8.44	7.62	6.82	6.07	5.30	4.62	4.08	3.86	3.77	3.78	3.79	3.82	3.85	3.82	3.79
105	10.4	9.74	8.92	8.09	7.31	6.72	6.20	5.71	5.14	4.62	4.20	4.03	3.97	3.97	3.98	4.00	4.03	4.00	3.98
110	9.34	8.93	8.24	7.48	6.74	6.28	5.89	5.52	5.03	4.57	4.19	4.03	3.97	3.96	3.96	3.98	3.99	3.98	3.96
115	8.82	8.59	7.95	7.20	6.44	6.03	5.69	5.38	4.94	4.52	4.17	4.02	3.95	3.94	3.94	3.94	3.95	3.94	3.94
120	9.57	9.67	8.70	7.39	6.07	5.62	5.36	5.19	4.81	4.45	4.15	4.02	3.96	3.94	3.93	3.93	3.93	3.93	3.93
125	8.49	8.67	7.96	6.95	5.90	5.50	5.25	5.07	4.76	4.49	4.26	4.17	4.14	4.14	4.12	4.11	4.11	4.11	4.12
130	6.26	6.31	6.21	6.03	5.79	5.51	5.23	4.95	4.71	4.50	4.36	4.33	4.35	4.39	4.39	4.39	4.39	4.39	4.39
135	5.87	5.96	5.81	5.55	5.26	5.06	4.88	4.72	4.55	4.41	4.32	4.34	4.40	4.48	4.51	4.53	4.53	4.53	4.51
140	5.10	5.23	5.24	5.17	5.03	4.83	4.61	4.40	4.28	4.21	4.18	4.24	4.32	4.41	4.46	4.50	4.50	4.50	4.46
145	4.67	4.82	4.75	4.60	4.41	4.28	4.16	4.07	4.02	4.00	4.02	4.08	4.17	4.25	4.32	4.36	4.36	4.36	4.32
150	4.28	4.46	4.41	4.27	4.09	3.98	3.89	3.82	3.81	3.83	3.86	3.92	3.97	4.03	4.07	4.09	4.08	4.09	4.07
155	3.88	4.08	4.05	3.93	3.76	3.70	3.65	3.61	3.59	3.57	3.57	3.61	3.64	3.66	3.63	3.58	3.51	3.58	3.63
160	3.50	3.72	3.72	3.63	3.51	3.51	3.52	3.52	3.46	3.39	3.33	3.31	3.29	3.26	3.18	3.10	3.00	3.10	3.18
165	3.07	3.30	3.36	3.33	3.26	3.25	3.23	3.19	3.11	3.02	2.92	2.82	2.71	2.62	2.54	2.48	2.43	2.48	2.54
170	2.73	2.90	2.94	2.90	2.83	2.76	2.68	2.58	2.44	2.29	2.14	2.00	1.89	1.81	1.78	1.77	1.79	1.77	1.78
175	2.58	2.68	2.72	2.70	2.65	2.54	2.41	2.27	2.17	2.08	1.99	1.92	1.85	1.81	1.80	1.81	1.84	1.81	1.80
180	2.34	2.33	2.33	2.34	2.34	2.33	2.31	2.28	2.22	2.15	2.08	2.02	1.97	1.93	1.92	1.92	1.93	1.92	1.92

C (DEG) γ	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	1017	1016	1016	1015	1016	1016	1017	1017	1017	1017	1017	1017	1017	1016	1013				
5	214	216	219	224	228	238	257	285	329	396	516	650	783	882	965				
10	409	406	401	388	340	287	239	215	206	214	223	265	353	519	744				
15	702	700	689	669	652	624	581	492	397	310	232	200	237	398	652				
20	378	387	406	441	536	630	697	668	601	510	366	254	216	356	614				
25	279	305	336	368	384	404	433	524	603	642	499	347	247	336	535				
30	196	213	236	266	309	356	402	453	492	510	447	385	358	436	579				
35	168	168	172	184	222	268	319	369	415	451	444	439	452	519	621				
40	71.8	84.4	103	126	154	188	228	278	330	381	421	460	499	544	593				
45	40.4	44.4	52.5	66.9	94.6	129	169	209	253	303	371	437	494	522	532				
50	15.4	18.5	24.4	33.8	47.2	66.6	93.5	134	182	233	291	345	390	411	416				
55	7.05	9.52	13.6	19.8	25.7	36.2	53.7	86.8	127	172	222	270	310	329	334				
60	3.66	5.70	9.00	13.8	18.6	26.6	39.2	59.9	86.8	120	168	215	255	272	275				
65	1.40	3.58	6.76	10.9	15.1	20.9	29.0	38.4	52.5	73.1	113	155	192	210	216				
70	0.85	2.76	5.44	8.79	11.8	16.0	21.7	29.4	40.0	54.1	76.8	101	125	142	155				
75	1.38	3.02	5.29	8.07	10.7	14.0	18.2	23.9	30.8	39.2	50.1	62.0	74.3	85.7	97.1				
80	2.01	3.26	5.04	7.28	9.70	12.6	16.2	20.8	26.0	31.7	37.9	44.0	49.7	54.2	57.9				
85	2.60	3.53	4.88	6.64	8.75	11.2	14.1	17.5	21.2	25.2	30.0	34.5	37.9	38.8	38.1				
90	3.15	3.57	4.29	5.35	7.10	9.06	11.1	12.6	14.0	15.5	18.0	20.2	21.7	21.6	20.5				
95	3.51	3.57	3.75	4.13	4.93	5.90	6.95	7.83	8.77	9.82	11.4	13.0	14.2	14.5	14.2				
100	3.78	3.77	3.86	4.08	4.62	5.30	6.07	6.82	7.62	8.44	9.34	10.2	11.0	11.7	12.2				
105	3.97	3.97	4.03	4.20	4.62	5.14	5.71	6.20	6.72	7.31	8.09	8.92	9.74	10.4	11.1				
110	3.96	3.97	4.03	4.19	4.57	5.03	5.52	5.89	6.28	6.74	7.48	8.24	8.93	9.34	9.59				
115	3.94	3.95	4.02	4.17	4.52	4.94	5.38	5.69	6.03	6.44	7.20	7.95	8.59	8.82	8.81				
120	3.94	3.96	4.02	4.15	4.45	4.81	5.19	5.36	5.62	6.07	7.39	8.70	9.67	9.57	8.83				
125	4.14	4.14	4.17	4.26	4.49	4.76	5.07	5.25	5.50	5.90	6.95	7.96	8.67	8.49	7.76				
130	4.39	4.35	4.33	4.36	4.50	4.71	4.95	5.23	5.51	5.79	6.03	6.21	6.31	6.26	6.10				
135	4.48	4.40	4.34	4.32	4.41	4.55	4.72	4.88	5.06	5.26	5.55	5.81	5.96	5.87	5.62				
140	4.41	4.32	4.24	4.18	4.21	4.28	4.40	4.61	4.83	5.03	5.17	5.24	5.23	5.10	4.86				
145	4.25	4.17	4.08	4.02	4.00	4.02	4.07	4.16	4.28	4.41	4.60	4.75	4.82	4.67	4.40				
150	4.03	3.97	3.92	3.86	3.83	3.81	3.82	3.89	3.98	4.09	4.27	4.41	4.46	4.28	3.96				
155	3.66	3.64	3.61	3.57	3.57	3.59	3.61	3.65	3.70	3.76	3.93	4.05	4.08	3.88	3.53				
160	3.26	3.29	3.31	3.33	3.39	3.46	3.52	3.52	3.51	3.51	3.63	3.72	3.72	3.50	3.14				
165	2.62	2.71	2.82	2.92	3.02	3.11	3.19	3.23	3.25	3.26	3.33	3.36	3.30	3.07	2.72				
170	1.81	1.89	2.00	2.14	2.29	2.44	2.58	2.68	2.76	2.83	2.90	2.94	2.90	2.73	2.46				
175	1.81	1.85	1.92	1.99	2.08	2.17	2.27	2.41	2.54	2.65	2.70	2.72	2.68	2.58	2.42				
180	1.93	1.97	2.02	2.08	2.15	2.22	2.28	2.31	2.33	2.34	2.34	2.33	2.32	2.34	2.36				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34M @ 60W / 5000K	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	0.545	65.1	0.995	2.46
277.0	60	0.252	64.3	0.920	7.22

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*****