

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

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Issue Date: 2023-06-14

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		4274
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		147.4
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		4155
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	143.3
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		29.0
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	3.18
			277V	9.26
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.994
			277V	0.877
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		74.1
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-29
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%		4.6%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		277.0
(Goniophotometer – Section 4.2)		Non-Worst Case		120.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.119
(Goniophotometer – Section 4.2)		Non-Worst Case		0.242
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		29.0
(Goniophotometer – Section 4.2)		Non-Worst Case		28.9

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34S @ 25W / 5000K	230612003-S1
2	Goniophotometer Test	2023-06-13	W34S @ 25W / 5000K	230612003-S1
3	THD and PF Test	2023-06-13	W34S @ 25W / 5000K	230612003-S1

Remark (If any)

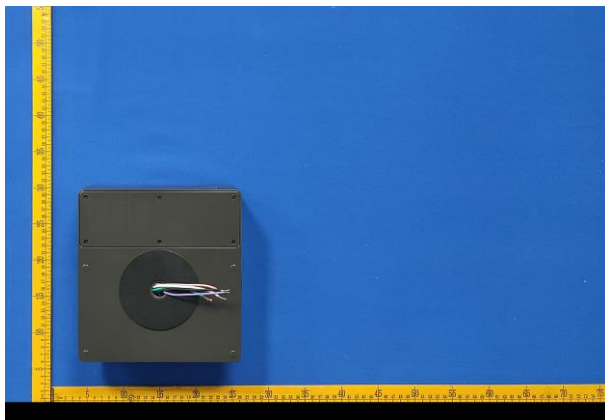
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34S @ 25W / 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.	W34S @ 25W / 5000K	Sample ID	230612003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

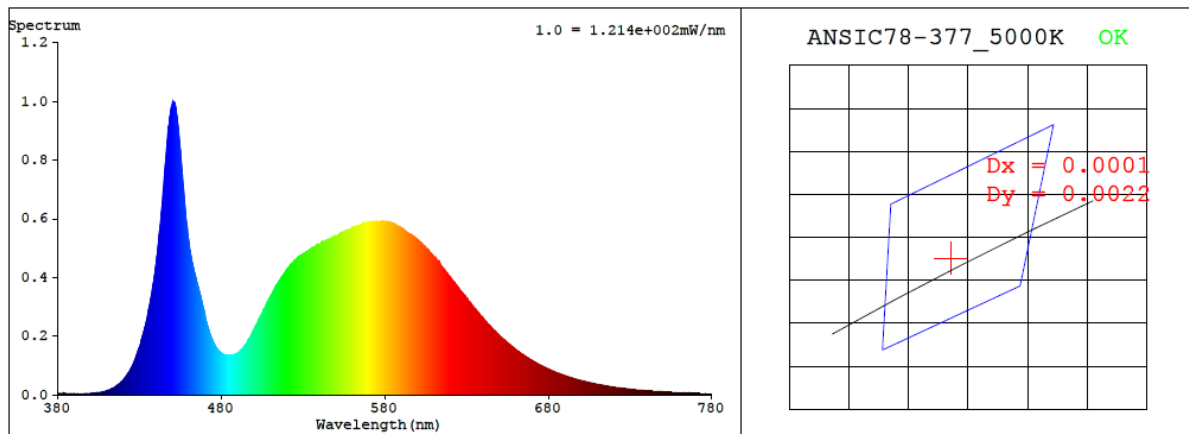
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.242	28.9	0.994
277.0	60	0.119	29.0	0.877

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5048	74.1	-29	0.0011	75	94	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3439$ $y = 0.3528$ / $u' = 0.2102$ $v' = 0.4851$ ($duv=1.05e-03$)

CCT= 5048K Prcp WL: Ld=570.9nm Purity=9.0%

Peak WL: Lp=450nm FWHM: =19.6nm Ratio:R=14.4% G=82.0% B=3.6%

Render Index: Ra = 74.1 AvgR = 64.3 TM30:Rf=75 Rg=93

EEL: 0.09447 A++ Highest

R1 =71	R2 =80	R3 =86	R4 =74	R5 =72	R6 =72	R7 =82
R8 =56	R9 =-29	R10=52	R11=70	R12=47	R13=73	R14=92 R15=66

4.1 Integrating Sphere Test

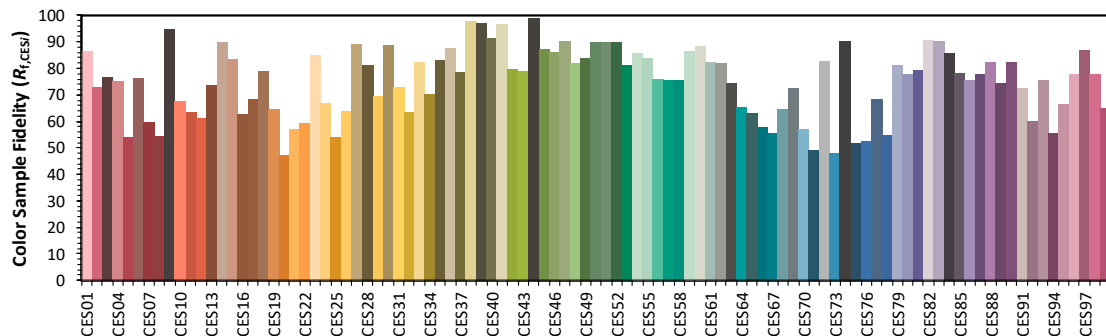
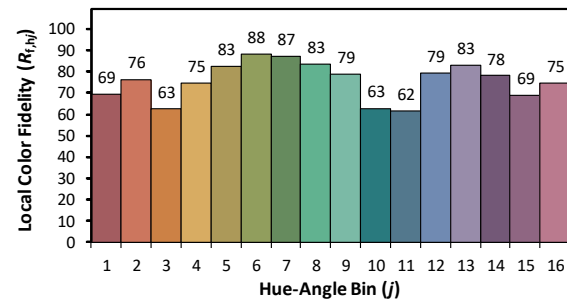
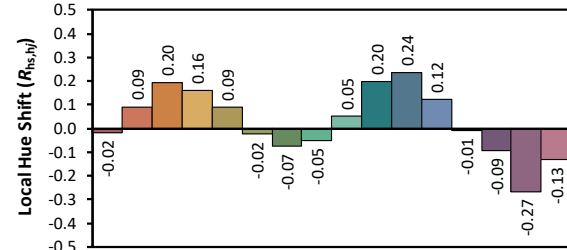
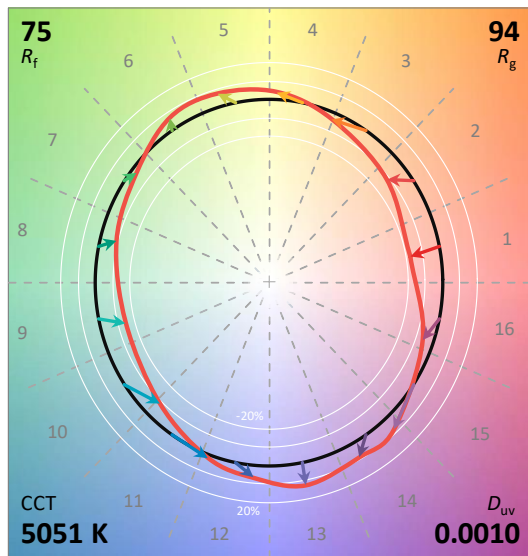
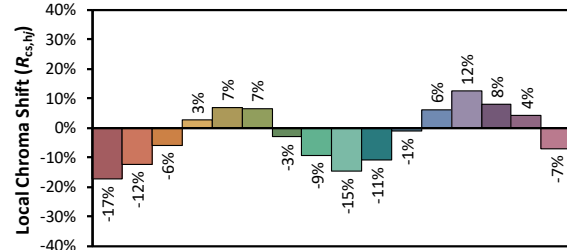
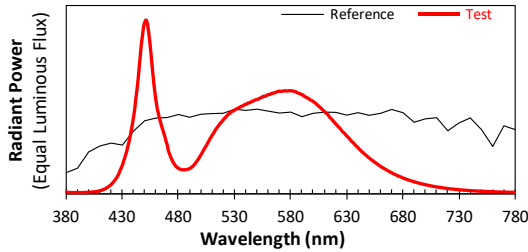
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34S @ 25W / 5000K



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

x 0.3439

y 0.3526

u' 0.2102

v' 0.4850

CIE 13.3-1995
(CRI)

R_a 74

R_g -29

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	7.00E-06	447	8.63E-04	514	3.75E-04	581	5.90E-04	648	2.14E-04	715	3.10E-05
381	3.90E-06	448	9.12E-04	515	3.83E-04	582	5.89E-04	649	2.07E-04	716	3.01E-05
382	4.20E-06	449	9.62E-04	516	3.92E-04	583	5.87E-04	650	2.02E-04	717	2.91E-05
383	3.30E-06	450	9.86E-04	517	4.01E-04	584	5.85E-04	651	1.97E-04	718	2.80E-05
384	3.90E-06	451	9.98E-04	518	4.07E-04	585	5.83E-04	652	1.92E-04	719	2.75E-05
385	3.30E-06	452	9.85E-04	519	4.15E-04	586	5.79E-04	653	1.88E-04	720	2.64E-05
386	3.30E-06	453	9.48E-04	520	4.24E-04	587	5.76E-04	654	1.83E-04	721	2.56E-05
387	2.80E-06	454	8.97E-04	521	4.31E-04	588	5.74E-04	655	1.77E-04	722	2.50E-05
388	3.50E-06	455	8.37E-04	522	4.37E-04	589	5.71E-04	656	1.73E-04	723	2.41E-05
389	2.50E-06	456	7.68E-04	523	4.46E-04	590	5.66E-04	657	1.69E-04	724	2.36E-05
390	2.80E-06	457	7.00E-04	524	4.51E-04	591	5.66E-04	658	1.64E-04	725	2.30E-05
391	3.60E-06	458	6.35E-04	525	4.59E-04	592	5.59E-04	659	1.59E-04	726	2.21E-05
392	3.30E-06	459	5.79E-04	526	4.61E-04	593	5.55E-04	660	1.55E-04	727	2.14E-05
393	3.40E-06	460	5.32E-04	527	4.69E-04	594	5.52E-04	661	1.50E-04	728	2.09E-05
394	3.00E-06	461	4.91E-04	528	4.72E-04	595	5.48E-04	662	1.47E-04	729	2.04E-05
395	3.50E-06	462	4.61E-04	529	4.75E-04	596	5.45E-04	663	1.42E-04	730	1.96E-05
396	4.00E-06	463	4.33E-04	530	4.80E-04	597	5.40E-04	664	1.39E-04	731	1.89E-05
397	3.90E-06	464	4.10E-04	531	4.83E-04	598	5.36E-04	665	1.36E-04	732	1.83E-05
398	4.40E-06	465	3.86E-04	532	4.87E-04	599	5.32E-04	666	1.32E-04	733	1.81E-05
399	4.80E-06	466	3.65E-04	533	4.89E-04	600	5.29E-04	667	1.27E-04	734	1.74E-05
400	5.30E-06	467	3.44E-04	534	4.94E-04	601	5.24E-04	668	1.24E-04	735	1.68E-05
401	5.40E-06	468	3.23E-04	535	4.96E-04	602	5.19E-04	669	1.20E-04	736	1.64E-05
402	5.60E-06	469	2.97E-04	536	5.01E-04	603	5.13E-04	670	1.17E-04	737	1.60E-05
403	6.50E-06	470	2.77E-04	537	5.02E-04	604	5.07E-04	671	1.13E-04	738	1.53E-05
404	7.20E-06	471	2.46E-04	538	5.06E-04	605	5.01E-04	672	1.11E-04	739	1.51E-05
405	7.60E-06	472	2.27E-04	539	5.11E-04	606	4.96E-04	673	1.08E-04	740	1.46E-05
406	8.40E-06	473	2.10E-04	540	5.13E-04	607	4.90E-04	674	1.05E-04	741	1.39E-05
407	9.50E-06	474	1.95E-04	541	5.14E-04	608	4.83E-04	675	1.01E-04	742	1.38E-05
408	1.07E-05	475	1.81E-04	542	5.19E-04	609	4.77E-04	676	9.89E-05	743	1.34E-05
409	1.21E-05	476	1.70E-04	543	5.21E-04	610	4.71E-04	677	9.57E-05	744	1.28E-05
410	1.36E-05	477	1.60E-04	544	5.23E-04	611	4.64E-04	678	9.35E-05	745	1.26E-05
411	1.58E-05	478	1.53E-04	545	5.27E-04	612	4.59E-04	679	9.01E-05	746	1.21E-05
412	1.76E-05	479	1.48E-04	546	5.30E-04	613	4.54E-04	680	8.75E-05	747	1.19E-05
413	2.06E-05	480	1.43E-04	547	5.33E-04	614	4.44E-04	681	8.55E-05	748	1.13E-05
414	2.31E-05	481	1.39E-04	548	5.36E-04	615	4.35E-04	682	8.26E-05	749	1.13E-05
415	2.58E-05	482	1.37E-04	549	5.38E-04	616	4.30E-04	683	8.05E-05	750	1.08E-05
416	3.05E-05	483	1.35E-04	550	5.41E-04	617	4.22E-04	684	7.80E-05	751	1.06E-05
417	3.44E-05	484	1.35E-04	551	5.42E-04	618	4.14E-04	685	7.56E-05	752	1.02E-05
418	3.89E-05	485	1.35E-04	552	5.45E-04	619	4.07E-04	686	7.36E-05	753	1.00E-05
419	4.42E-05	486	1.35E-04	553	5.49E-04	620	4.01E-04	687	7.15E-05	754	9.70E-06
420	4.95E-05	487	1.36E-04	554	5.51E-04	621	3.92E-04	688	6.94E-05	755	9.60E-06
421	5.64E-05	488	1.37E-04	555	5.56E-04	622	3.87E-04	689	6.74E-05	756	9.00E-06
422	6.39E-05	489	1.39E-04	556	5.59E-04	623	3.79E-04	690	6.54E-05	757	8.90E-06
423	7.24E-05	490	1.43E-04	557	5.58E-04	624	3.73E-04	691	6.35E-05	758	8.40E-06
424	8.05E-05	491	1.45E-04	558	5.60E-04	625	3.65E-04	692	6.18E-05	759	8.20E-06
425	8.96E-05	492	1.52E-04	559	5.65E-04	626	3.56E-04	693	5.97E-05	760	8.00E-06
426	1.01E-04	493	1.57E-04	560	5.68E-04	627	3.50E-04	694	5.83E-05	761	7.80E-06
427	1.15E-04	494	1.64E-04	561	5.68E-04	628	3.44E-04	695	5.65E-05	762	7.60E-06
428	1.31E-04	495	1.72E-04	562	5.71E-04	629	3.36E-04	696	5.46E-05	763	7.10E-06
429	1.46E-04	496	1.81E-04	563	5.75E-04	630	3.30E-04	697	5.30E-05	764	7.10E-06
430	1.61E-04	497	1.90E-04	564	5.75E-04	631	3.23E-04	698	5.16E-05	765	6.90E-06
431	1.82E-04	498	1.99E-04	565	5.78E-04	632	3.16E-04	699	5.03E-05	766	6.60E-06
432	2.01E-04	499	2.10E-04	566	5.79E-04	633	3.08E-04	700	4.86E-05	767	6.60E-06
433	2.23E-04	500	2.21E-04	567	5.82E-04	634	3.01E-04	701	4.75E-05	768	6.20E-06
434	2.45E-04	501	2.32E-04	568	5.85E-04	635	2.94E-04	702	4.59E-05	769	6.10E-06
435	2.73E-04	502	2.44E-04	569	5.86E-04	636	2.89E-04	703	4.44E-05	770	6.10E-06
436	2.98E-04	503	2.56E-04	570	5.88E-04	637	2.81E-04	704	4.32E-05	771	5.80E-06
437	3.31E-04	504	2.66E-04	571	5.87E-04	638	2.74E-04	705	4.18E-05	772	5.70E-06
438	3.64E-04	505	2.76E-04	572	5.87E-04	639	2.68E-04	706	4.07E-05	773	5.30E-06
439	4.00E-04	506	2.89E-04	573	5.88E-04	640	2.62E-04	707	3.92E-05	774	5.30E-06
440	4.41E-04	507	3.00E-04	574	5.90E-04	641	2.55E-04	708	3.83E-05	775	5.20E-06
441	4.84E-04	508	3.13E-04	575	5.90E-04	642	2.48E-04	709	3.71E-05	776	5.10E-06
442	5.45E-04	509	3.22E-04	576	5.89E-04	643	2.42E-04	710	3.60E-05	777	5.10E-06
443	5.95E-04	510	3.34E-04	577	5.89E-04	644	2.37E-04	711	3.49E-05	778	4.90E-06
444	6.56E-04	511	3.43E-04	578	5.90E-04	645	2.30E-04	712	3.39E-05	779	4.70E-06
445	7.24E-04	512	3.54E-04	579	5.90E-04	646	2.24E-04	713	3.31E-05	780	4.70E-06
446	7.96E-04	513	3.65E-04	580	5.90E-04	647	2.19E-04	714	3.20E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34S @ 25W / 5000K	Sample ID	230612003-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	25.0	Humidity (%RH)	40.1

Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at $25 \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.</p> <p>The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1.0° vertical intervals and 15° horizontal intervals.</p>

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.0	60	0.119	29.0	0.877
NON-WORST CASE	120.0	60	0.242	28.9	0.994

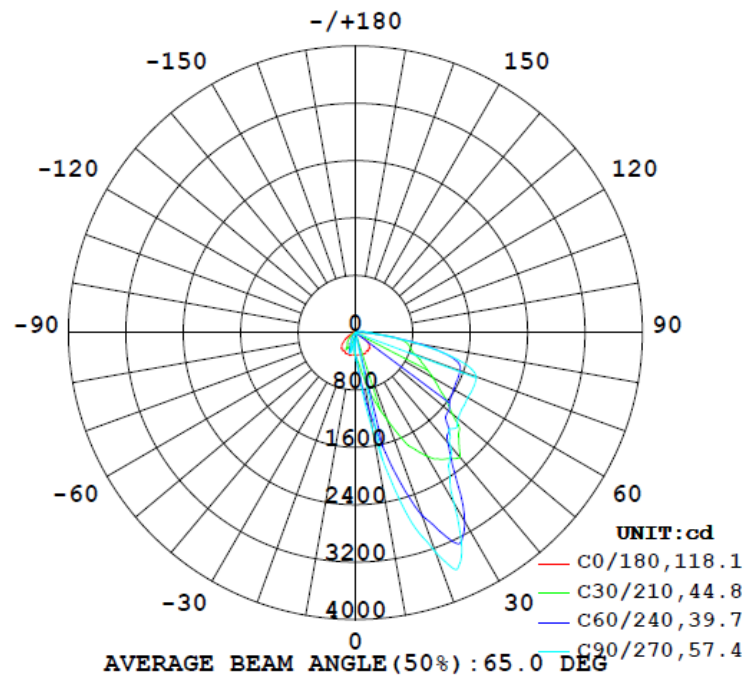
Test Result

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	4274	83.6	131.2	54.1	78.7	147.4	4.5%	B0-U3-G2
0°-90° zones	4155	83.6	131.2	54.1	78.7	143.3	4.6%	B0-U3-G2

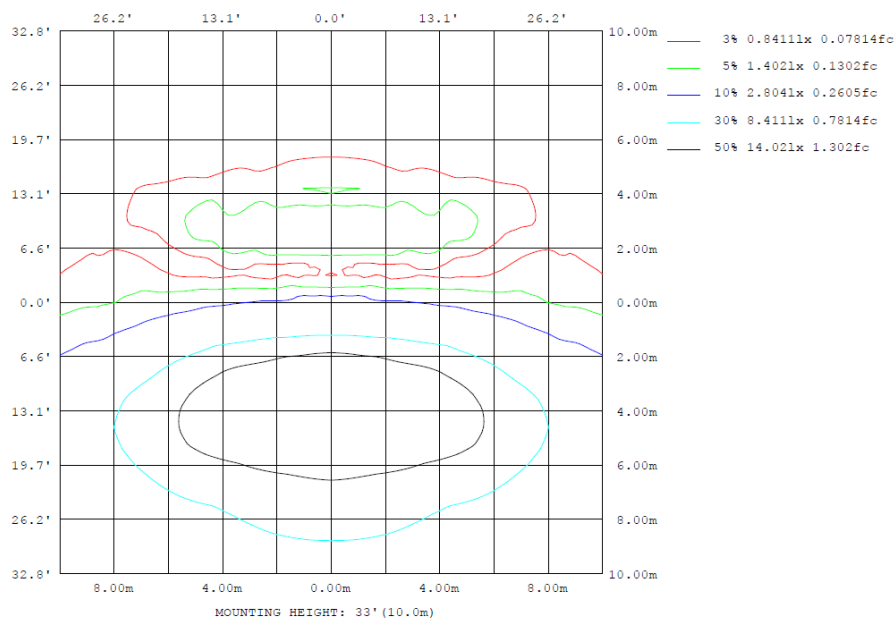
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

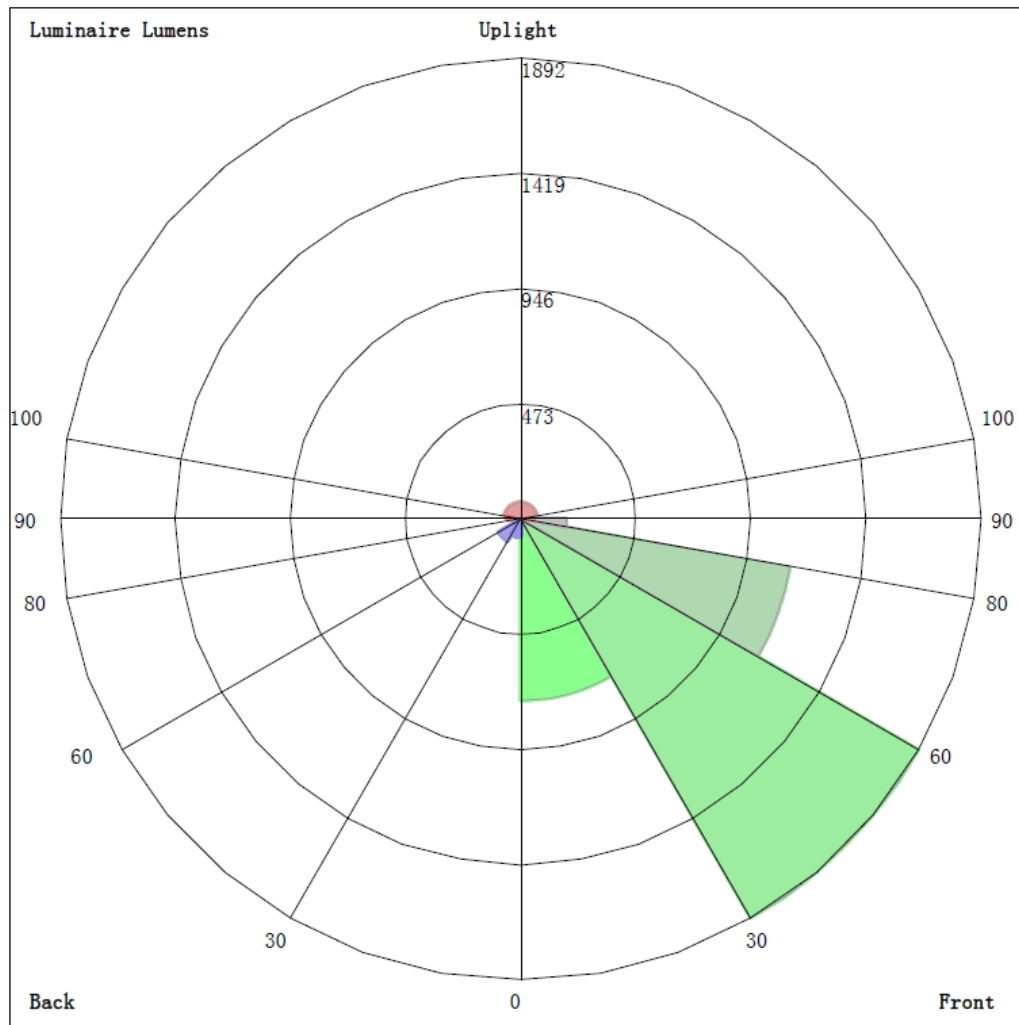
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	314.0	873.7	1375	873.7	314.0	69.50	155.9	69.50	0- 10	36.34	36.34	0.85,0.85
20	322.0	2005	3248	2005	322.0	254.0	166.7	254.0	10- 20	233.0	269.4	6.3,6.3
30	303.2	2950	2746	2950	303.2	183.0	89.12	183.0	20- 30	549.7	819.0	19.2,19.2
40	291.9	2444	2059	2444	291.9	96.77	30.80	96.77	30- 40	668.0	1487	34.8,34.8
50	243.9	1686	1868	1686	243.9	43.48	4.327	43.48	40- 50	675.0	2162	50.6,50.6
60	144.8	1443	1807	1443	144.8	15.16	1.194	15.16	50- 60	653.7	2816	65.9,65.9
70	75.62	1360	1787	1360	75.62	8.603	0.2497	8.603	60- 70	625.7	3441	80.5,80.5
80	23.32	983.7	861.2	983.7	23.32	5.712	0.6601	5.712	70- 80	522.6	3964	92.8,92.8
90	7.550	172.4	184.3	172.4	7.550	3.252	1.189	3.252	80- 90	190.5	4155	97.2,97.2
100	5.184	77.02	120.5	77.02	5.184	2.306	1.547	2.306	90-100	52.94	4208	98.5,98.5
110	4.140	33.73	52.86	33.73	4.140	2.190	1.637	2.190	100-110	26.77	4234	99.1,99.1
120	3.041	29.31	38.35	29.31	3.041	2.156	1.623	2.156	110-120	15.41	4250	99.4,99.4
130	2.519	19.85	32.18	19.85	2.519	2.214	1.912	2.214	120-130	11.06	4261	99.7,99.7
140	2.005	11.32	19.45	11.32	2.005	2.037	2.059	2.037	130-140	7.471	4268	99.9,99.9
150	1.533	6.924	11.21	6.924	1.533	1.761	1.909	1.761	140-150	3.357	4272	100,100
160	1.198	3.096	5.409	3.096	1.198	1.601	1.470	1.601	150-160	1.507	4273	100,100
170	1.025	0.7546	0.6209	0.7546	1.025	1.238	0.8379	1.238	160-170	0.4648	4274	100,100
180	1.153	1.036	0.9646	1.036	1.153	1.093	0.9277	1.093	170-180	0.0910	4274	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	36.34	0-10	36.34	0.85%
10-20	233.01	0-20	269.35	6.30%
20-30	549.69	0-30	819.04	19.17%
30-40	667.97	0-40	1487.01	34.80%
40-50	675.01	0-50	2162.02	50.59%
50-60	653.67	0-60	2815.69	65.89%
60-70	625.74	0-70	3441.43	80.53%
70-80	522.60	0-80	3964.03	92.76%
80-90	190.54	0-90	4154.57	97.22%
90-100	52.94	0-100	4207.51	98.45%
100-110	26.77	0-110	4234.28	99.08%
110-120	15.41	0-120	4249.69	99.44%
120-130	11.06	0-130	4260.75	99.70%
130-140	7.47	0-140	4268.22	99.88%
140-150	3.36	0-150	4271.58	99.95%
150-160	1.51	0-160	4273.09	99.99%
160-170	0.46	0-170	4273.55	100.00%
170-180	0.09	0-180	4273.64	100.00%

4.2 Goniophotometer Test

LCS/BUG

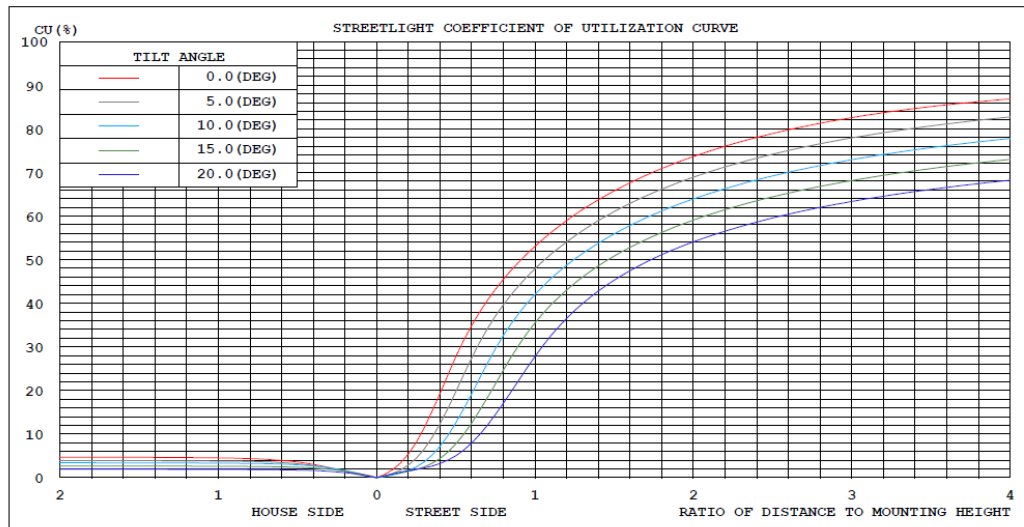


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

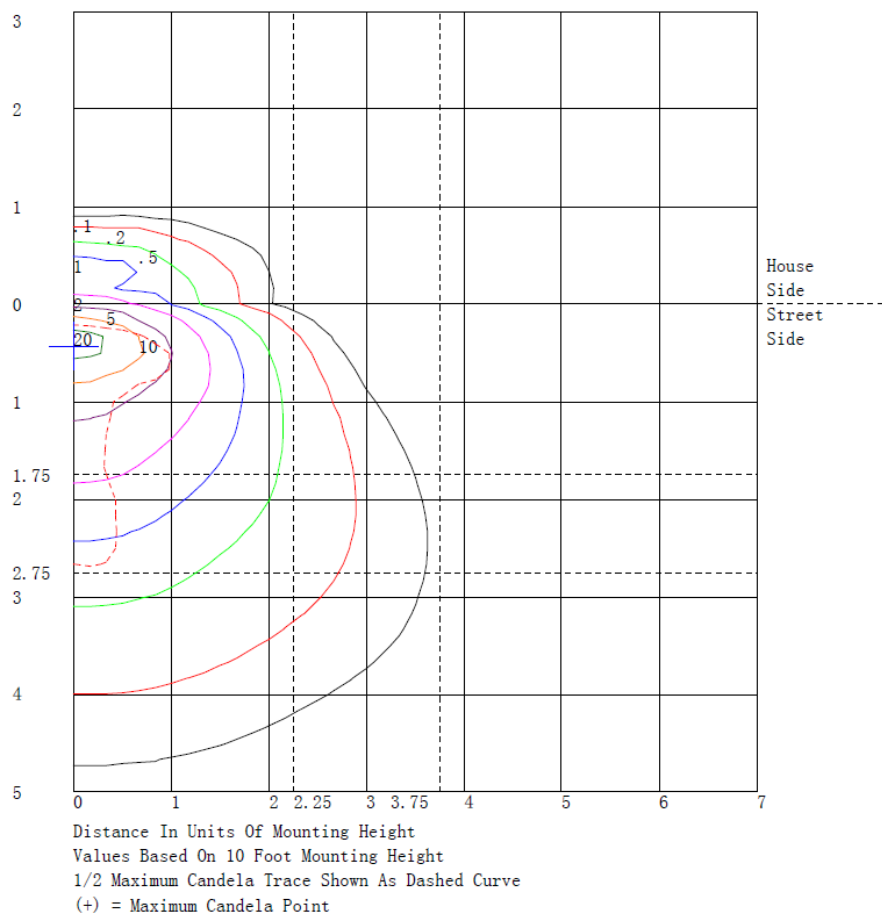
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	744.6	N.A.	17.4
FM - Front-Medium (30-60)	1891.7	N.A.	44.3
FH - Front-High (60-80)	1125.4	N.A.	26.3
FVH - Front-Very High (80-90)	187.3	N.A.	4.4
BL - Back-Low (0-30)	74.4	N.A.	1.7
BM - Back-Medium (30-60)	104.9	N.A.	2.5
BH - Back-High (60-80)	23.0	N.A.	0.5
BVH - Back-Very High (80-90)	3.3	N.A.	0.1
UL - Uplight-Low (90-100)	52.9	N.A.	1.2
UH - Uplight-High (100-180)	66.1	N.A.	1.5
Total	4273.6	N.A.	100.0
BUG Rating	B0-U3-G2		

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	311	311	312	312	312	312	312	313	313	314	314	314	315	315	315	316	316	316	317
5	314	321	332	346	365	386	407	426	445	464	486	507	528	547	564	579	590	598	603
10	314	339	374	417	470	533	604	691	782	874	958	1038	1113	1181	1242	1293	1333	1361	1375
15	327	363	425	514	637	780	936	1094	1256	1420	1583	1742	1893	2030	2153	2259	2352	2418	2451
20	322	406	521	667	851	1059	1285	1520	1761	2005	2259	2498	2708	2847	2953	3037	3134	3207	3248
25	323	443	608	819	1101	1410	1728	2016	2291	2551	2804	3027	3210	3311	3374	3410	3448	3472	3481
30	303	460	665	921	1251	1612	1982	2354	2686	2950	3051	3074	3040	2969	2880	2794	2759	2744	2746
35	313	461	672	946	1339	1755	2153	2470	2707	2843	2758	2600	2421	2346	2296	2267	2255	2254	2259
40	292	444	667	960	1411	1868	2265	2425	2478	2444	2311	2152	2007	2001	2030	2072	2072	2067	2059
45	275	500	753	1032	1403	1753	2032	2079	2043	1962	1911	1861	1820	1814	1821	1838	1860	1880	1894
50	244	469	706	953	1259	1541	1760	1786	1749	1686	1677	1680	1695	1739	1789	1835	1856	1866	1868
55	193	442	677	897	1123	1321	1475	1525	1537	1532	1553	1580	1613	1670	1729	1781	1808	1823	1824
60	145	375	587	779	956	1110	1239	1326	1392	1443	1490	1535	1581	1649	1716	1773	1799	1809	1807
65	109	278	442	600	755	902	1042	1176	1296	1400	1464	1516	1565	1642	1716	1778	1805	1815	1812
70	75.6	162	268	391	541	704	873	1050	1216	1360	1441	1500	1550	1626	1697	1755	1781	1791	1787
75	45.6	85.2	158	265	422	600	788	973	1143	1286	1358	1403	1429	1464	1492	1510	1513	1509	1501
80	23.3	43.6	101	194	351	525	696	823	920	984	979	950	911	900	893	887	877	867	861
85	14.8	38.7	78.1	133	221	311	390	421	432	426	408	384	361	355	355	356	353	351	350
90	7.55	14.5	26.6	43.8	70.1	98.5	126	146	162	172	172	168	163	167	173	179	182	184	184
95	5.79	8.81	14.8	23.6	36.3	51.2	67.7	87.0	105	120	125	127	128	134	141	148	151	153	154
100	5.18	8.35	12.4	17.4	22.8	29.5	37.9	50.8	64.3	77.0	84.5	90.5	95.9	103	110	115	118	120	120
105	4.97	7.62	10.8	14.5	18.9	23.6	28.6	33.3	38.2	43.6	50.0	56.7	63.7	71.1	78.0	83.7	86.6	88.0	88.2
110	4.14	6.03	8.59	11.8	16.3	21.1	25.6	28.5	31.1	33.7	37.5	41.3	44.9	47.9	50.4	52.2	52.8	53.0	52.9
115	3.48	4.97	7.16	10.1	14.3	18.7	22.9	25.5	27.6	29.6	32.2	34.9	37.6	40.4	42.8	44.7	45.0	44.8	44.3
120	3.04	4.43	6.19	8.32	10.8	13.6	16.9	21.2	25.5	29.3	31.0	32.0	32.9	34.8	36.7	38.3	38.6	38.6	38.4
125	2.78	3.60	4.86	6.56	8.58	11.1	14.3	19.2	24.1	28.5	30.3	31.3	31.8	32.7	33.4	33.9	33.8	33.5	33.2
130	2.52	2.87	3.72	5.07	7.12	9.52	12.1	14.4	16.9	19.8	24.8	29.7	33.8	34.5	34.1	33.1	32.7	32.4	32.2
135	2.24	2.30	2.86	3.92	5.79	7.92	10.1	11.3	12.6	14.1	16.4	19.3	22.9	28.2	33.7	38.7	41.5	43.1	43.7
140	2.00	1.86	2.17	2.94	4.43	6.16	7.93	9.12	10.2	11.3	12.7	14.1	15.5	16.8	17.9	18.8	19.3	19.5	19.5
145	1.76	1.28	1.27	1.73	2.96	4.45	5.99	6.99	7.90	8.79	9.93	11.1	12.1	13.0	13.8	14.3	14.5	14.5	14.4
150	1.53	1.07	0.97	1.24	2.06	3.12	4.27	5.19	6.08	6.92	7.76	8.54	9.26	9.92	10.5	10.9	11.1	11.2	11.2
155	1.33	1.06	1.00	1.13	1.49	2.03	2.70	3.51	4.37	5.20	5.87	6.44	6.90	7.21	7.41	7.53	7.57	7.57	7.53
160	1.20	1.14	1.11	1.10	1.04	1.06	1.21	1.75	2.41	3.10	3.64	4.14	4.56	4.92	5.19	5.38	5.44	5.44	5.41
165	1.08	1.07	1.05	1.03	0.99	0.95	0.93	0.93	0.98	1.10	1.39	1.74	2.10	2.37	2.59	2.77	2.88	2.95	2.98
170	1.03	1.01	0.99	0.96	0.93	0.90	0.87	0.83	0.79	0.75	0.72	0.69	0.66	0.64	0.62	0.61	0.60	0.61	0.62
175	1.07	1.06	1.05	1.04	1.02	1.00	0.98	0.96	0.93	0.91	0.88	0.85	0.83	0.80	0.78	0.77	0.76	0.76	0.78
180	1.15	1.15	1.15	1.14	1.13	1.12	1.10	1.08	1.06	1.04	1.01	0.99	0.97	0.95	0.94	0.93	0.94	0.95	0.96

																			UNIT: cd			
C (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185			
0	316	316	316	315	315	315	314	314	314	313	313	312	312	312	312	312	311	311	314			
5	598	590	579	564	547	528	507	486	464	445	426	407	386	365	346	332	321	314	318			
10	1361	1333	1293	1242	1181	1113	1038	958	874	782	691	604	533	470	417	374	339	314	261			
15	2418	2352	2259	2153	2030	1893	1742	1583	1420	1256	1094	936	780	637	514	425	363	327	236			
20	3207	3134	3037	2953	2847	2708	2498	2259	2005	1761	1520	1285	1059	851	667	521	406	322	216			
25	3472	3448	3410	3374	3311	3210	3027	2804	2551	2291	2016	1728	1410	1101	819	608	443	323	203			
30	2744	2759	2794	2880	2969	3040	3074	3051	2950	2686	2354	1982	1612	1251	921	665	460	303	192			
35	2254	2255	2267	2296	2346	2421	2600	2758	2843	2707	2470	2153	1755	1339	946	672	461	313	230			
40	2067	2072	2072	2030	2001	2007	2152	2311	2444	2478	2425	2265	1868	1411	960	667	444	292	241			
45	1880	1860	1838	1821	1814	1820	1861	1911	1962	2043	2079	2032	1753	1403	1032	753	500	275	245			
50	1866	1856	1835	1789	1739	1695	1680	1677	1686	1749	1786	1760	1541	1259	953	706	469	244	224			
55	1823	1808	1781	1729	1670	1613	1580	1553	1532	1537	1525	1475	1321	1123	897	677	442	193	177			
60	1809	1799	1773	1716	1649	1581	1535	1490	1443	1392	1326	1239	1110	956	779	587	375	145	147			
65	1815	1805	1778	1716	1642	1565	1516	1464	1400	1296	1176	1042	902	755	600	442	278	109	110			
70	1791	1781	1755	1697	1626	1550	1500	1441	1360	1216	1050	873	704	541	391	268	162	75.6	69.4			
75	1509	1513	1510	1492	1464	1429	1403	1358	1286	1143	973	788	600	422	265	158	85.2	45.6	40.7			
80	867	877	887	893	900	911	950	979	984	920	823	696	525	351	194	101	43.6	23.3	22.6			
85	351	353	356	355	355	361	384	408	426	432	421	390	311	221	133	78.1	38.7	14.8	15.1			
90	184	182	179	173	167	163	168	172	172	162	146	126	98.5	70.1	43.8	26.6	14.5	7.55	7.31			
95	153	151	148	141	134	128	127	125	120	105	87.0	67.7	51.2	36.3	23.6	14.8	8.81	5.79	5.83			
100	120	118	115	110	103	95.9	90.5	84.5	77.0	64.3	50.8	37.9	29.5	22.8	17.4	12.4	8.35	5.18	4.95			
105	88.0	86.6	83.7	78.0	71.1	63.7	56.7	50.0	43.6	38.2	33.3	28.6	23.6	18.9	14.5	10.8	7.62	4.97	4.85			
110	53.0	52.8	52.2	50.4	47.9	44.9	41.3	37.5	33.7	31.1	28.5	25.6	21.1	16.3	11.8	8.59	6.03	4.14	4.44			
115	44.8	45.0	44.7	42.8	40.4	37.6	34.9	32.2	29.6	27.6	25.5	22.9	18.7	14.3	10.1	7.16	4.97	3.48	4.32			
120	38.6	38.6	38.3	36.7	34.8	32.9	32.0	31.0	29.3	25.5	21.2	16.9	13.6	10.8	8.32	6.19	4.43	3.04	4.29			
125	33.5	33.8	33.9	33.4	32.7	31.8	31.3	30.3	28.5	24.1	19.2	14.3	11.1	8.58	6.56	4.86	3.60	2.78	3.90			
130	32.4	32.7	33.1	34.1	34.5	33.8	29.7	24.8	19.8	16.9	14.4	12.1	9.52	7.12	5.07	3.72	2.87	2.52	2.96			
135	43.1	41.5	38.7	33.7	28.2	22.9	19.3	16.4	14.1	12.6	11.3	10.1	7.92	5.79	3.92	2.86	2.30	2.24	2.50			
140	19.5	19.3	18.8	17.9	16.8	15.5	14.1	12.7	11.3	10.2	9.12	7.93	6.16	4.93	4.24	2.92	2.17	1.86	2.00			
145	14.5	14.5	14.3	13.8	13.0	12.1	11.1	9.93	8.79	7.90	6.99	5.99	4.45	2.96	1.73	1.27	1.28	1.76	1.92			
150	11.2	11.1	10.9	10.5	9.92	9.26	8.54	7.76	6.92	6.08	5.19	4.27	3.22	2.06	1.24	0.97	1.07	1.53	1.71			
155	7.57	7.57	7.53	7.41	7.21	6.96	6.44	5.87	5.20	4.37	3.51	2.70	2.03	1.49	1.13	1.00	1.06	1.33	1.55			
160	5.44	5.44	5.38	5.19	4.92	4.56	4.14	3.64	3.10	2.41	1.75	1.21	1.06	1.04	1.10	1.11	1.14	1.20	1.42			
165	2.95	2.88	2.77	2.59	2.37	2.10	1.74	1.39	1.10	0.98	0.93	0.93	0.95	0.99	1.03	1.05	1.07	1.08	1.26			
170	0.61	0.60	0.61	0.62	0.64	0.66	0.69	0.72	0.75	0.79	0.83	0.87	0.90	0.93	0.96	0.99	1.01	1.03	1.13			
175	0.76	0.76	0.77	0.78	0.80	0.83	0.85	0.88	0.91	0.93	0.96	0.98	1.00	1.02	1.04	1.05	1.06	1.07	1.12			
180	0.95	0.94	0.93	0.94	0.95	0.97	0.99	1.01	1.04	1.06	1.08	1.10	1.12	1.13	1.14	1.15	1.15	1.15	1.13			

Table--3

UNIT: °C

γ (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	316	318	318	318	318	318	318	318	318	318	318	318	318	318	317	317	317	317	317
5	313	298	269	233	196	165	138	117	107	103	101	98.9	97.4	96.6	95.3	94.4	93.9	94.4	95.3
10	214	175	142	116	96.2	81.5	72.6	69.5	74.0	83.1	95.5	111	126	140	149	154	156	154	149
15	165	114	86.7	77.8	85.3	114	150	188	213	233	247	251	252	251	259	265	269	265	259
20	141	98.9	101	125	162	197	229	254	253	241	224	205	186	170	165	165	167	165	165
25	124	86.1	117	170	224	222	208	189	186	182	178	166	153	141	136	134	134	134	136
30	124	97.2	145	211	271	257	224	183	160	141	125	114	107	102	96.0	91.7	89.1	91.7	96.0
35	171	138	146	167	189	178	159	136	116	97.0	81.3	73.5	69.1	66.9	64.4	63.0	62.7	63.0	64.4
40	203	178	177	182	184	158	128	96.8	78.8	65.0	54.3	45.1	38.1	33.3	31.1	30.5	30.8	30.5	31.1
45	218	194	175	157	139	117	94.8	74.1	58.2	45.1	34.5	26.8	21.1	17.2	14.3	12.7	12.2	12.7	14.3
50	202	179	152	125	99.6	78.2	59.4	43.5	30.7	20.7	13.3	9.00	6.56	5.45	4.56	4.24	4.33	4.24	4.56
55	160	142	120	97.4	75.5	55.4	37.7	23.2	15.3	10.5	7.81	5.24	3.60	2.69	2.23	2.14	2.28	2.14	2.23
60	142	129	102	72.3	44.1	30.1	20.9	15.2	10.6	7.58	5.72	3.77	2.36	1.43	1.08	1.05	1.19	1.05	1.08
65	106	95.0	72.7	48.3	26.0	17.3	13.0	11.2	8.20	5.90	4.14	2.57	1.39	0.59	0.31	0.30	0.43	0.30	0.31
70	61.9	53.3	41.7	30.1	19.8	14.4	10.9	8.60	6.28	4.47	3.07	1.83	0.89	0.26	0.08	0.11	0.25	0.11	0.08
75	35.6	30.4	24.4	18.6	13.5	10.5	8.27	6.65	5.04	3.72	2.63	1.67	0.93	0.42	0.28	0.31	0.42	0.31	0.28
80	21.2	19.3	16.3	13.2	10.1	8.31	6.88	5.71	4.49	3.40	2.47	1.69	1.08	0.66	0.55	0.57	0.66	0.57	0.55
85	14.8	13.9	11.9	9.60	7.36	6.18	5.30	4.58	3.71	2.90	2.20	1.64	1.21	0.92	0.84	0.86	0.92	0.86	0.84
90	6.97	6.51	5.86	5.17	4.49	4.04	3.64	3.25	2.75	2.27	1.84	1.54	1.32	1.18	1.14	1.15	1.19	1.15	1.14
95	5.70	5.42	4.86	4.22	3.58	3.17	2.83	2.53	2.19	1.89	1.64	1.50	1.41	1.37	1.37	1.38	1.40	1.38	1.37
100	4.68	4.37	4.00	3.61	3.22	2.89	2.59	2.31	2.04	1.82	1.64	1.56	1.52	1.52	1.52	1.53	1.55	1.53	1.52
105	4.64	4.35	3.90	3.42	2.97	2.68	2.45	2.25	2.03	1.84	1.69	1.63	1.61	1.61	1.62	1.63	1.64	1.63	1.62
110	4.53	4.42	3.95	3.38	2.81	2.54	2.34	2.19	1.99	1.82	1.68	1.63	1.61	1.61	1.62	1.63	1.64	1.63	1.62
115	4.77	4.83	4.26	3.49	2.71	2.43	2.27	2.18	1.99	1.82	1.69	1.63	1.61	1.61	1.61	1.62	1.62	1.62	1.61
120	5.00	5.19	4.52	3.57	2.60	2.32	2.20	2.16	1.99	1.84	1.72	1.66	1.64	1.63	1.62	1.62	1.62	1.62	1.62
125	4.56	4.76	4.22	3.44	2.63	2.37	2.25	2.19	2.05	1.93	1.83	1.78	1.76	1.76	1.75	1.74	1.73	1.74	1.75
130	3.23	3.32	3.16	2.89	2.59	2.44	2.32	2.21	2.11	2.02	1.95	1.93	1.92	1.93	1.93	1.92	1.91	1.92	1.93
135	2.67	2.75	2.71	2.61	2.47	2.36	2.26	2.16	2.08	2.02	1.99	1.99	2.01	2.03	2.04	2.04	2.03	2.04	2.04
140	2.37	2.46	2.48	2.45	2.38	2.27	2.15	2.04	1.98	1.96	1.95	1.97	2.01	2.04	2.05	2.06	2.06	2.06	2.05
145	2.03	2.10	2.10	2.06	2.01	1.96	1.92	1.88	1.87	1.86	1.87	1.91	1.95	1.99	2.01	2.02	2.01	2.02	2.01
150	1.86	1.94	1.94	1.90	1.84	1.81	1.78	1.76	1.77	1.78	1.80	1.83	1.86	1.89	1.90	1.91	1.91	1.91	1.90
155	1.71	1.80	1.80	1.75	1.69	1.67	1.65	1.65	1.66	1.67	1.69	1.70	1.71	1.71	1.72	1.71	1.70	1.71	1.72
160	1.57	1.67	1.67	1.63	1.58	1.58	1.59	1.60	1.60	1.60	1.60	1.59	1.57	1.56	1.53	1.50	1.47	1.50	1.53
165	1.39	1.48	1.49	1.48	1.45	1.46	1.47	1.48	1.47	1.44	1.41	1.38	1.34	1.29	1.26	1.22	1.19	1.22	1.26
170	1.21	1.26	1.27	1.26	1.24	1.25	1.25	1.24	1.20	1.14	1.08	1.01	0.94	0.89	0.86	0.84	0.84	0.84	0.86
175	1.17	1.20	1.21	1.21	1.19	1.19	1.17	1.14	1.09	1.03	0.97	0.93	0.90	0.87	0.86	0.87	0.87	0.87	0.86
180	1.09	1.08	1.07	1.07	1.08	1.09	1.09	1.09	1.08	1.06	1.04	1.01	0.98	0.95	0.94	0.93	0.93	0.93	0.94

γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	318	318	318	318	318	318	318	318	318	318	318	318	318	316	314				
5	96.6	97.4	98.9	101	103	107	117	138	165	196	233	269	298	313	318				
10	140	126	111	95.5	83.1	74.0	69.5	72.6	81.5	96.2	116	142	175	214	261				
15	251	252	251	247	233	213	188	150	114	85.3	77.8	86.7	114	165	236				
20	170	186	205	224	241	253	254	229	197	162	125	101	98.9	141	216				
25	141	153	166	178	182	186	189	208	222	224	170	117	86.1	124	203				
30	102	107	114	125	141	160	183	224	257	271	211	145	97.2	124	192				
35	66.9	69.1	73.5	81.3	97.0	116	136	159	178	189	167	146	138	171	230				
40	33.3	38.1	45.1	54.3	65.0	78.8	96.8	128	158	184	182	177	178	203	241				
45	17.2	21.1	26.8	34.5	45.1	58.2	74.1	94.8	117	139	157	175	194	218	245				
50	5.45	6.56	9.00	13.3	20.7	30.7	43.5	59.4	78.2	99.6	125	152	179	202	224				
55	2.69	3.60	5.24	7.81	10.5	15.3	23.2	37.7	55.4	75.5	97.4	120	142	160	177				
60	1.43	2.36	3.77	5.72	7.58	10.6	15.2	20.9	30.1	44.1	72.3	102	129	142	147				
65	0.59	1.39	2.57	4.14	5.90	8.20	11.2	13.0	17.3	26.0	48.3	72.7	95.0	106	110				
70	0.26	0.89	1.83	3.07	4.47	6.28	8.60	10.9	14.4	19.8	30.1	41.7	53.3	61.9	69.4				
75	0.42	0.93	1.67	2.63	3.72	5.04	6.65	8.27	10.5	13.5	18.6	24.4	30.4	35.6	40.7				
80	0.66	1.08	1.69	2.47	3.40	4.49	5.71	6.88	8.31	10.1	13.2	16.3	19.3	21.2	22.6				
85	0.92	1.21	1.64	2.20	2.90	3.71	4.58	5.30	6.18	7.36	9.60	11.9	13.9	14.8	15.1				
90	1.18	1.32	1.54	1.84	2.27	2.75	3.25	3.64	4.04	4.49	5.17	5.86	6.51	6.97	7.31				
95	1.37	1.41	1.50	1.64	1.89	2.19	2.53	2.83	3.17	3.58	4.22	4.86	5.42	5.70	5.83				
100	1.52	1.52	1.56	1.64	1.82	2.04	2.31	2.59	2.89	3.22	3.61	4.00	4.37	4.68	4.95				
105	1.61	1.61	1.63	1.69	1.84	2.03	2.25	2.45	2.68	2.97	3.42	3.90	4.35	4.64	4.85				
110	1.61	1.61	1.63	1.68	1.82	1.99	2.19	2.34	2.54	2.81	3.38	3.95	4.42	4.53	4.44				
115	1.61	1.61	1.63	1.69	1.82	1.99	2.18	2.27	2.43	2.71	3.49	4.26	4.83	4.77	4.32				
120	1.63	1.64	1.66	1.72	1.84	1.99	2.16	2.20	2.32	2.60	3.57	4.52	5.19	5.00	4.29				
125	1.76	1.76	1.78	1.83	1.93	2.05	2.19	2.25	2.37	2.63	3.44	4.22	4.76	4.56	3.90				
130	1.93	1.92	1.93	1.95	2.02	2.11	2.21	2.32	2.44	2.59	2.89	3.16	3.32	3.23	2.96				
135	2.03	2.01	1.99	1.99	2.02	2.08	2.16	2.26	2.36	2.47	2.61	2.71	2.75	2.67	2.50				
140	2.04	2.01	1.97	1.95	1.96	1.98	2.04	2.15	2.27	2.38	2.45	2.48	2.46	2.37	2.22				
145	1.99	1.95	1.91	1.87	1.86	1.87	1.88	1.92	1.96	2.01	2.06	2.10	2.10	2.03	1.92				
150	1.89	1.86	1.83	1.80	1.78	1.77	1.76	1.78	1.81	1.84	1.90	1.94	1.94	1.86	1.72				
155	1.71	1.71	1.70	1.69	1.67	1.66	1.65	1.65	1.67	1.69	1.75	1.80	1.80	1.71	1.55				
160	1.56	1.57	1.59	1.60	1.60	1.60	1.60	1.59	1.58	1.58	1.63	1.67	1.67	1.57	1.42				
165	1.29	1.34	1.38	1.41	1.44	1.47	1.48	1.47	1.46	1.45	1.48	1.49	1.48	1.39	1.26				
170	0.89	0.94	1.01	1.08	1.14	1.20	1.24	1.25	1.25	1.24	1.26	1.27	1.26	1.21	1.13				
175	0.87	0.90	0.93	0.97	1.03	1.09	1.14	1.17	1.19	1.19	1.21	1.21	1.20	1.17	1.13				
180	0.95	0.98	1.01	1.04	1.06	1.08	1.09	1.09	1.09	1.08	1.07	1.07	1.08	1.09	1.12				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34S @ 25W / 5000K	Sample ID	230612003-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	0.242	28.9	0.994	3.18
277.0	60	0.119	29.0	0.877	9.26

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*****