

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Prepared By

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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		2881
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones)	IES LM-79-2008	N/A		150.1
Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	300		2801
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones)	IES LM-79-2008	Standard	Premium	145.9
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.2
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	2.80
			277V	15.34
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.987
			277V	0.787
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	5013
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥70		73.9
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	N/A		-30
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%		4.5%
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		0.088
(Goniophotometer – Section 4.2)		Non-Worst Case		0.159
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		19.2
(Goniophotometer – Section 4.2)		Non-Worst Case		18.8

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023-06-13	W34S @ 17W / 5000K	230612003-S1
2	Goniophotometer Test	2023-06-13	W34S @ 17W / 5000K	230612003-S1
3	THD and PF Test	2023-06-13	W34S @ 17W / 5000K	230612003-S1

Remark (If any)

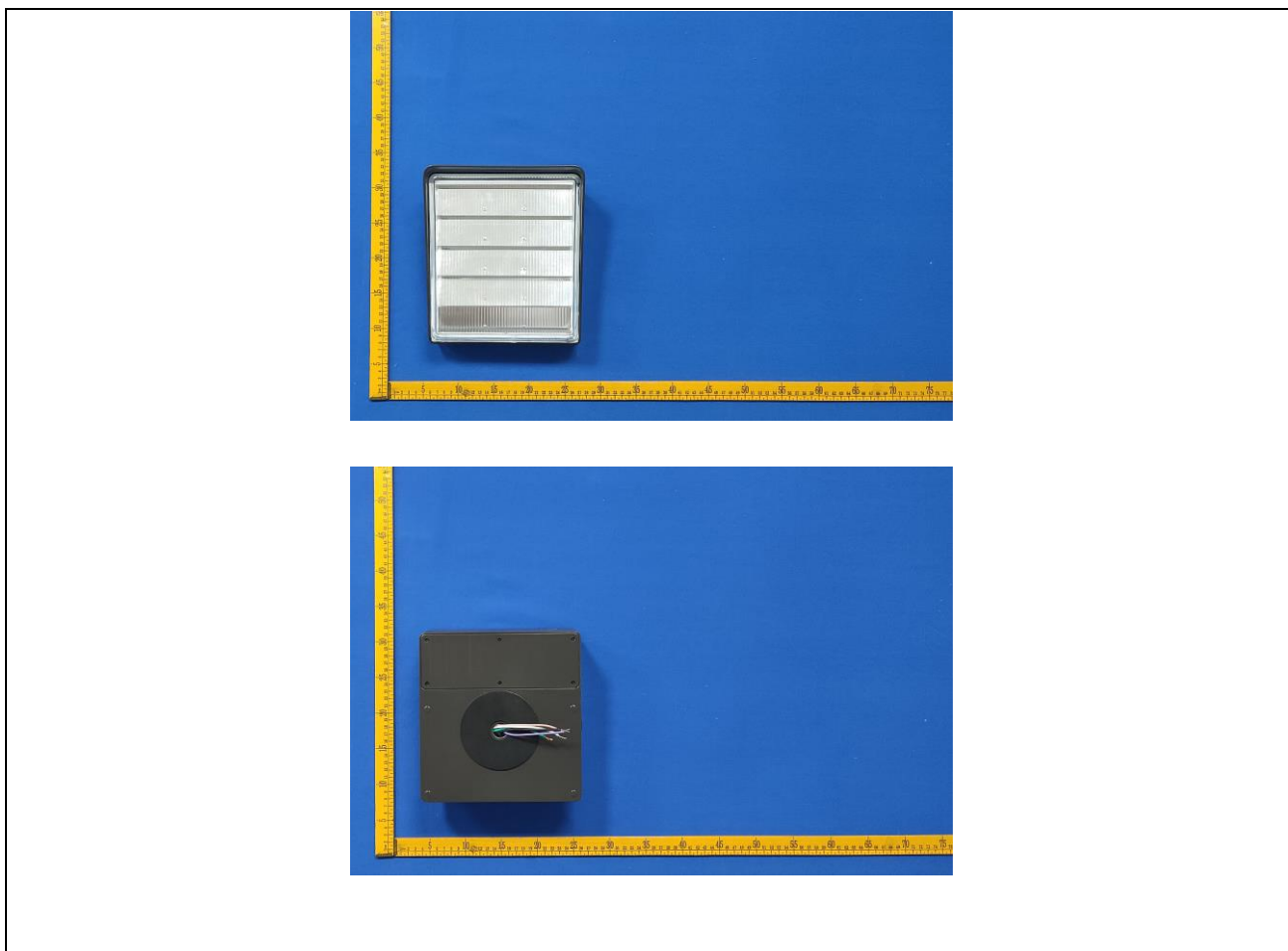
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. W34S @ 17W / 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 @ 17W / 5000K	Sample ID	230612003-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

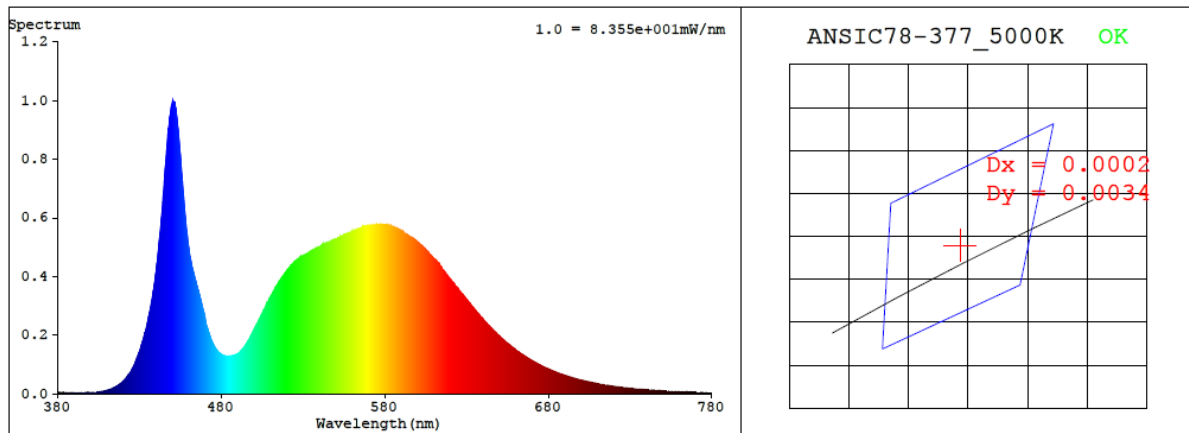
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using 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	0.159	18.8	0.987
277.0	60	0.088	19.2	0.787

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
5013	73.9	-30	0.0016	75	94	-17%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3450$ $y = 0.3547$ / $u' = 0.2101$ $v' = 0.4862$ ($duv=1.61e-03$)

CCT= 5013K Prcp WL: Ld=570.9nm Purity=9.9%

Peak WL: Lp=450nm FWHM: =18.4nm Ratio:R=14.4% G=82.0% B=3.5%

Render Index: Ra = 73.9 AvgR = 63.9 TM30:Rf=75 Rg=93

EEL: 0.09264 A++ Highest

R1 =71	R2 =80	R3 =86	R4 =73	R5 =72	R6 =72	R7 =82
R8 =55	R9 =-30	R10=52	R11=70	R12=46	R13=73	R14=92 R15=65

4.1 Integrating Sphere Test

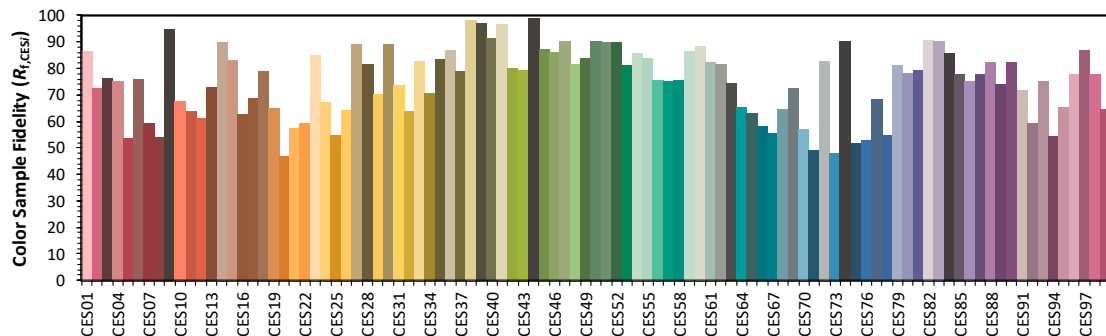
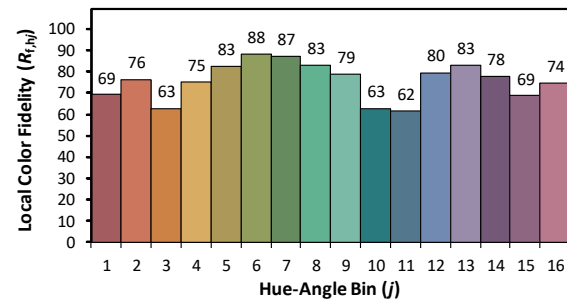
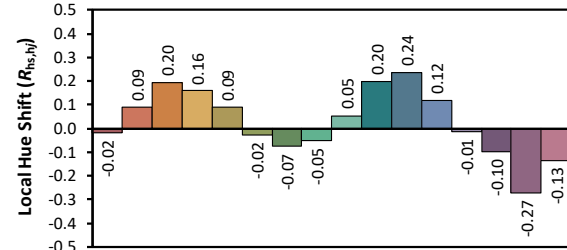
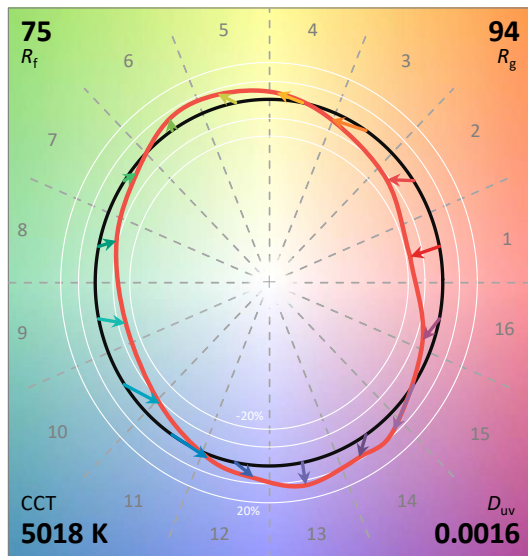
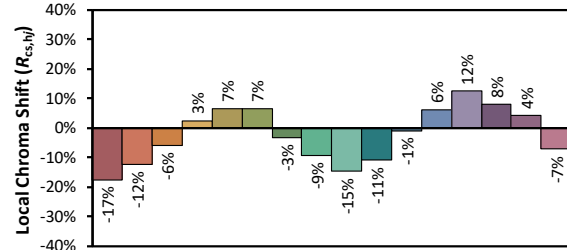
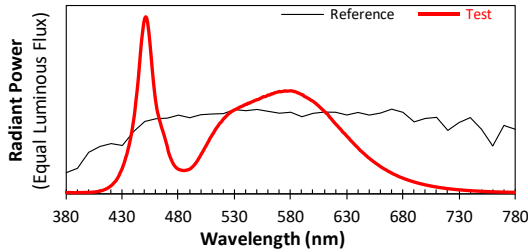
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/6/14

Model: W34S @ 17W / 5000K



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

x 0.3449
 y 0.3545
 u' 0.2102
 v' 0.4861

CIE 13.3-1995
(CRI)

R_a 74
 R_g -30

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	2.80E-06	447	8.53E-04	514	3.69E-04	581	5.77E-04	648	2.08E-04	715	2.93E-05
381	2.70E-06	448	9.08E-04	515	3.78E-04	582	5.76E-04	649	2.01E-04	716	2.91E-05
382	3.80E-06	449	9.58E-04	516	3.87E-04	583	5.73E-04	650	1.97E-04	717	2.76E-05
383	3.40E-06	450	9.87E-04	517	3.96E-04	584	5.73E-04	651	1.91E-04	718	2.71E-05
384	3.20E-06	451	9.95E-04	518	4.01E-04	585	5.70E-04	652	1.87E-04	719	2.58E-05
385	2.90E-06	452	9.79E-04	519	4.10E-04	586	5.67E-04	653	1.82E-04	720	2.53E-05
386	2.70E-06	453	9.38E-04	520	4.18E-04	587	5.65E-04	654	1.77E-04	721	2.45E-05
387	2.50E-06	454	8.84E-04	521	4.25E-04	588	5.62E-04	655	1.72E-04	722	2.37E-05
388	2.30E-06	455	8.17E-04	522	4.31E-04	589	5.59E-04	656	1.68E-04	723	2.33E-05
389	2.60E-06	456	7.43E-04	523	4.38E-04	590	5.55E-04	657	1.63E-04	724	2.25E-05
390	3.20E-06	457	6.73E-04	524	4.44E-04	591	5.54E-04	658	1.59E-04	725	2.16E-05
391	3.20E-06	458	6.09E-04	525	4.52E-04	592	5.47E-04	659	1.54E-04	726	2.12E-05
392	3.40E-06	459	5.51E-04	526	4.53E-04	593	5.43E-04	660	1.50E-04	727	2.04E-05
393	3.20E-06	460	5.06E-04	527	4.60E-04	594	5.41E-04	661	1.45E-04	728	1.98E-05
394	3.30E-06	461	4.67E-04	528	4.63E-04	595	5.36E-04	662	1.42E-04	729	1.92E-05
395	3.50E-06	462	4.40E-04	529	4.67E-04	596	5.34E-04	663	1.37E-04	730	1.88E-05
396	3.50E-06	463	4.15E-04	530	4.71E-04	597	5.29E-04	664	1.35E-04	731	1.81E-05
397	3.80E-06	464	3.93E-04	531	4.73E-04	598	5.25E-04	665	1.31E-04	732	1.80E-05
398	4.10E-06	465	3.70E-04	532	4.77E-04	599	5.21E-04	666	1.27E-04	733	1.71E-05
399	3.70E-06	466	3.51E-04	533	4.79E-04	600	5.18E-04	667	1.23E-04	734	1.66E-05
400	4.30E-06	467	3.31E-04	534	4.84E-04	601	5.13E-04	668	1.20E-04	735	1.61E-05
401	4.60E-06	468	3.09E-04	535	4.86E-04	602	5.08E-04	669	1.17E-04	736	1.56E-05
402	4.90E-06	469	2.86E-04	536	4.89E-04	603	5.02E-04	670	1.13E-04	737	1.48E-05
403	5.30E-06	470	2.64E-04	537	4.91E-04	604	4.97E-04	671	1.09E-04	738	1.47E-05
404	5.70E-06	471	2.34E-04	538	4.94E-04	605	4.91E-04	672	1.07E-04	739	1.44E-05
405	6.30E-06	472	2.15E-04	539	4.99E-04	606	4.85E-04	673	1.04E-04	740	1.39E-05
406	7.00E-06	473	1.98E-04	540	5.01E-04	607	4.79E-04	674	1.01E-04	741	1.36E-05
407	8.10E-06	474	1.83E-04	541	5.02E-04	608	4.73E-04	675	9.79E-05	742	1.29E-05
408	9.00E-06	475	1.70E-04	542	5.08E-04	609	4.67E-04	676	9.46E-05	743	1.26E-05
409	1.03E-05	476	1.59E-04	543	5.07E-04	610	4.61E-04	677	9.17E-05	744	1.22E-05
410	1.18E-05	477	1.51E-04	544	5.11E-04	611	4.55E-04	678	8.95E-05	745	1.19E-05
411	1.34E-05	478	1.44E-04	545	5.14E-04	612	4.50E-04	679	8.70E-05	746	1.15E-05
412	1.48E-05	479	1.39E-04	546	5.17E-04	613	4.45E-04	680	8.44E-05	747	1.12E-05
413	1.68E-05	480	1.35E-04	547	5.19E-04	614	4.35E-04	681	8.21E-05	748	1.09E-05
414	1.98E-05	481	1.32E-04	548	5.23E-04	615	4.27E-04	682	7.94E-05	749	1.03E-05
415	2.19E-05	482	1.31E-04	549	5.25E-04	616	4.21E-04	683	7.74E-05	750	1.03E-05
416	2.55E-05	483	1.29E-04	550	5.28E-04	617	4.13E-04	684	7.49E-05	751	9.80E-06
417	2.87E-05	484	1.28E-04	551	5.28E-04	618	4.05E-04	685	7.28E-05	752	9.50E-06
418	3.26E-05	485	1.28E-04	552	5.32E-04	619	3.97E-04	686	7.10E-05	753	9.40E-06
419	3.76E-05	486	1.28E-04	553	5.36E-04	620	3.91E-04	687	6.88E-05	754	8.90E-06
420	4.21E-05	487	1.30E-04	554	5.38E-04	621	3.84E-04	688	6.67E-05	755	8.90E-06
421	4.78E-05	488	1.31E-04	555	5.43E-04	622	3.78E-04	689	6.50E-05	756	8.40E-06
422	5.41E-05	489	1.33E-04	556	5.45E-04	623	3.70E-04	690	6.26E-05	757	8.20E-06
423	6.16E-05	490	1.36E-04	557	5.45E-04	624	3.64E-04	691	6.11E-05	758	7.90E-06
424	6.80E-05	491	1.40E-04	558	5.47E-04	625	3.57E-04	692	5.93E-05	759	7.80E-06
425	7.72E-05	492	1.46E-04	559	5.51E-04	626	3.48E-04	693	5.72E-05	760	7.40E-06
426	8.78E-05	493	1.51E-04	560	5.54E-04	627	3.41E-04	694	5.58E-05	761	7.30E-06
427	9.96E-05	494	1.58E-04	561	5.54E-04	628	3.36E-04	695	5.41E-05	762	7.10E-06
428	1.14E-04	495	1.66E-04	562	5.57E-04	629	3.29E-04	696	5.23E-05	763	6.70E-06
429	1.27E-04	496	1.75E-04	563	5.61E-04	630	3.22E-04	697	5.10E-05	764	6.90E-06
430	1.42E-04	497	1.84E-04	564	5.60E-04	631	3.15E-04	698	4.93E-05	765	6.70E-06
431	1.60E-04	498	1.95E-04	565	5.65E-04	632	3.09E-04	699	4.81E-05	766	6.30E-06
432	1.78E-04	499	2.05E-04	566	5.66E-04	633	3.00E-04	700	4.64E-05	767	6.00E-06
433	2.01E-04	500	2.17E-04	567	5.68E-04	634	2.94E-04	701	4.54E-05	768	5.90E-06
434	2.20E-04	501	2.28E-04	568	5.70E-04	635	2.87E-04	702	4.38E-05	769	5.60E-06
435	2.46E-04	502	2.38E-04	569	5.72E-04	636	2.81E-04	703	4.25E-05	770	5.60E-06
436	2.71E-04	503	2.50E-04	570	5.74E-04	637	2.74E-04	704	4.16E-05	771	5.40E-06
437	3.00E-04	504	2.61E-04	571	5.72E-04	638	2.67E-04	705	4.00E-05	772	5.50E-06
438	3.32E-04	505	2.72E-04	572	5.73E-04	639	2.61E-04	706	3.89E-05	773	5.30E-06
439	3.70E-04	506	2.84E-04	573	5.74E-04	640	2.55E-04	707	3.77E-05	774	5.10E-06
440	4.11E-04	507	2.95E-04	574	5.76E-04	641	2.48E-04	708	3.63E-05	775	4.90E-06
441	4.56E-04	508	3.09E-04	575	5.78E-04	642	2.41E-04	709	3.58E-05	776	4.80E-06
442	5.16E-04	509	3.18E-04	576	5.76E-04	643	2.36E-04	710	3.43E-05	777	4.60E-06
443	5.71E-04	510	3.29E-04	577	5.76E-04	644	2.30E-04	711	3.33E-05	778	4.50E-06
444	6.33E-04	511	3.38E-04	578	5.76E-04	645	2.25E-04	712	3.22E-05	779	4.30E-06
445	7.05E-04	512	3.49E-04	579	5.77E-04	646	2.18E-04	713	3.12E-05	780	4.30E-06
446	7.82E-04	513	3.60E-04	580	5.77E-04	647	2.13E-04	714	3.04E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	W34S @ 17W / 5000K	Sample ID	230612003-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	277.0	60	0.088	19.2	0.787
NON-WORST CASE	120.0	60	0.159	18.8	0.987

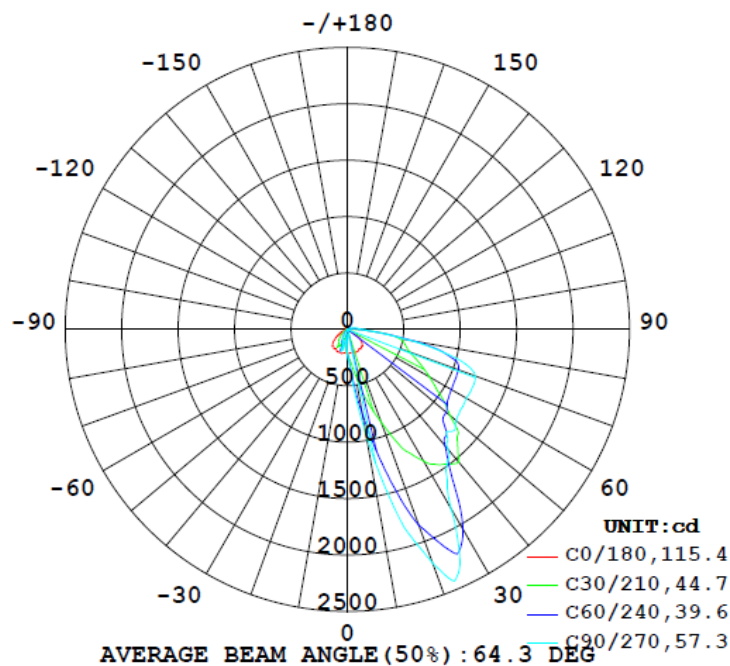
Test Result

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	2881	84.0	131.1	54.0	78.8	150.1	4.4%	B0-U2-G2
0°-90° zones	2801	84.0	131.1	54.0	78.8	145.9	4.5%	B0-U2-G2

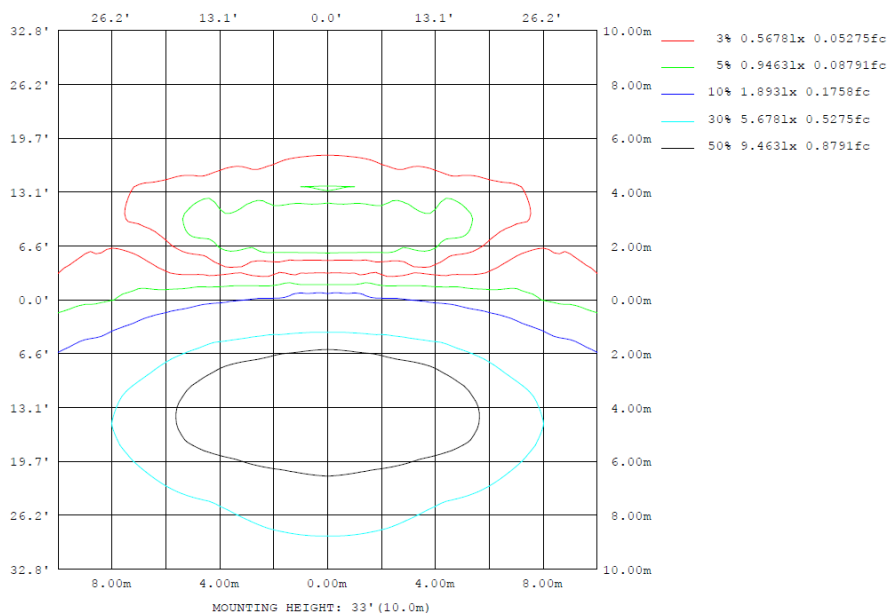
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

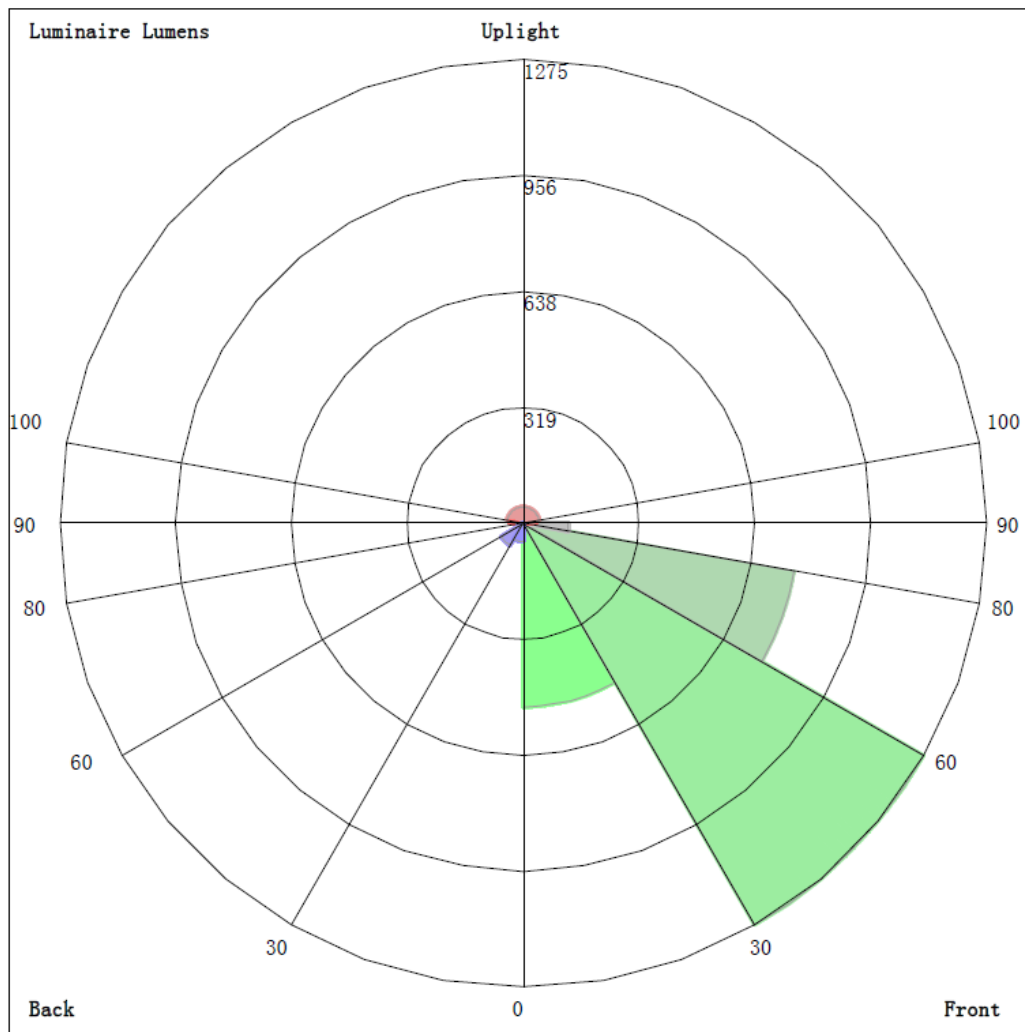
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	lum, lamp
10	212.0	595.4	936.2	595.4	212.0	46.75	103.5	46.75	0- 10	24.67	24.67	0.86,0.86
20	216.9	1361	2199	1361	216.9	169.6	112.4	169.6	10- 20	158.4	183.0	6.35,6.35
30	204.9	1990	1843	1990	204.9	123.3	60.47	123.3	20- 30	371.7	554.7	19.3,19.3
40	196.3	1641	1384	1641	196.3	65.55	20.85	65.55	30- 40	450.3	1005	34.9,34.9
50	161.2	1134	1260	1134	161.2	29.43	2.912	29.43	40- 50	454.9	1460	50.7,50.7
60	96.86	978.2	1219	978.2	96.86	10.22	0.7978	10.22	50- 60	440.6	1901	66,66
70	48.92	921.3	1203	921.3	48.92	5.809	0.1680	5.809	60- 70	421.8	2322	80.6,80.6
80	15.49	660.0	570.8	660.0	15.49	3.851	0.4428	3.851	70- 80	351.1	2673	92.8,92.8
90	4.995	115.5	123.7	115.5	4.995	2.188	0.8005	2.188	80- 90	127.2	2801	97.2,97.2
100	3.460	51.57	80.91	51.57	3.460	1.552	1.043	1.552	90-100	35.64	2836	98.5,98.5
110	2.783	22.65	35.46	22.65	2.783	1.477	1.103	1.477	100-110	17.94	2854	99.1,99.1
120	2.038	19.78	25.81	19.78	2.038	1.453	1.094	1.453	110-120	10.36	2865	99.4,99.4
130	1.688	13.34	21.75	13.34	1.688	1.492	1.288	1.492	120-130	7.448	2872	99.7,99.7
140	1.345	7.569	13.07	7.569	1.345	1.373	1.390	1.373	130-140	5.027	2877	99.9,99.9
150	1.031	4.639	7.501	4.639	1.031	1.189	1.289	1.189	140-150	2.251	2879	100,100
160	0.8072	2.065	3.617	2.065	0.8072	1.079	0.9944	1.079	150-160	1.011	2880	100,100
170	0.6929	0.5110	0.4215	0.5110	0.6929	0.8358	0.5684	0.8358	160-170	0.3120	2881	100,100
180	0.7811	0.7011	0.6525	0.7011	0.7811	0.7350	0.6276	0.7350	170-180	0.0616	2881	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	24.67	0-10	24.67	0.86%
10-20	158.38	0-20	183.05	6.35%
20-30	371.68	0-30	554.73	19.26%
30-40	450.33	0-40	1005.06	34.89%
40-50	454.89	0-50	1459.95	50.68%
50-60	440.60	0-60	1900.55	65.98%
60-70	421.81	0-70	2322.36	80.62%
70-80	351.11	0-80	2673.47	92.81%
80-90	127.23	0-90	2800.70	97.22%
90-100	35.64	0-100	2836.34	98.46%
100-110	17.94	0-110	2854.28	99.08%
110-120	10.36	0-120	2864.64	99.44%
120-130	7.45	0-130	2872.09	99.70%
130-140	5.03	0-140	2877.12	99.88%
140-150	2.25	0-150	2879.37	99.95%
150-160	1.01	0-160	2880.38	99.99%
160-170	0.31	0-170	2880.69	100.00%
170-180	0.06	0-180	2880.75	100.00%

4.2 Goniophotometer Test

LCS/BUG

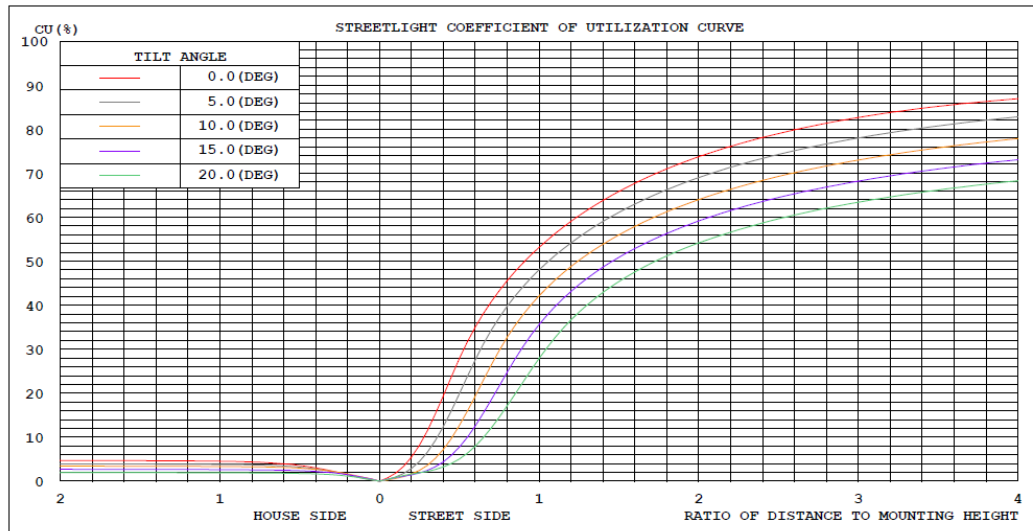


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

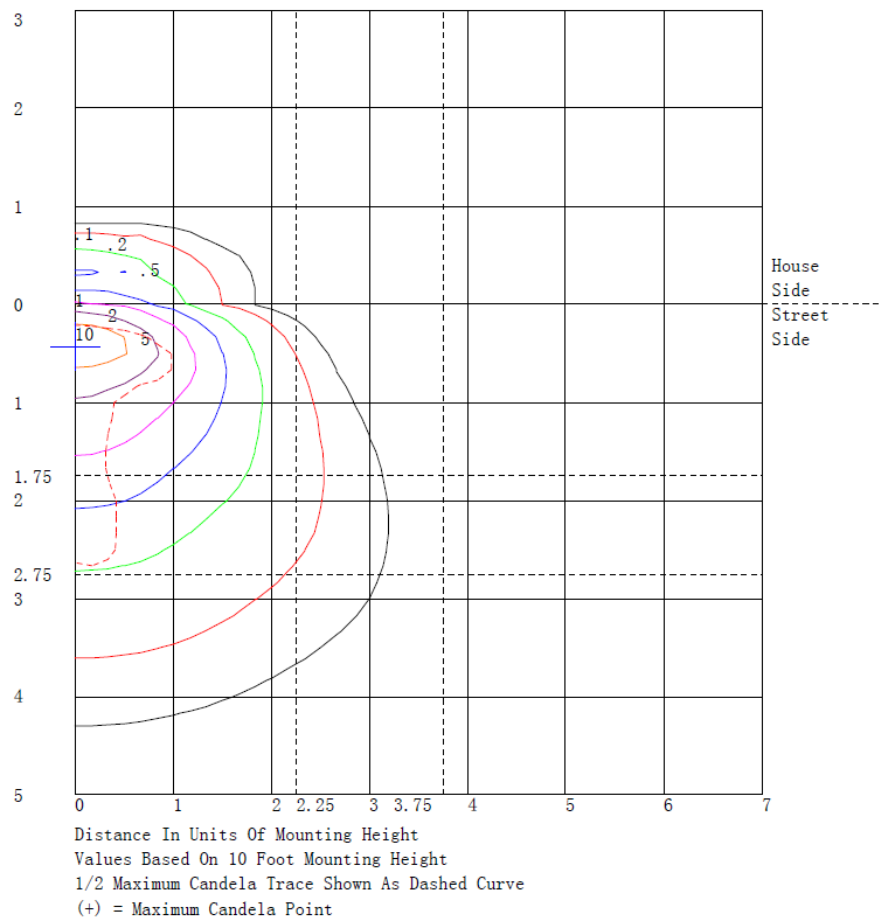
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	504.6	N.A.	17.5
FM - Front-Medium (30-60)	1275.2	N.A.	44.3
FH - Front-High (60-80)	757.5	N.A.	26.3
FVH - Front-Very High (80-90)	125.0	N.A.	4.3
BL - Back-Low (0-30)	50.2	N.A.	1.7
BM - Back-Medium (30-60)	70.7	N.A.	2.5
BH - Back-High (60-80)	15.4	N.A.	0.5
BVH - Back-Very High (80-90)	2.2	N.A.	0.1
UL - Uplight-Low (90-100)	35.6	N.A.	1.2
UH - Uplight-High (100-180)	44.4	N.A.	1.5
Total	2880.8	N.A.	100.0
BUG Rating	B0-U2-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
y (DEG)	0	211	210	210	211	211	212	214	214	215	216	217	218	219	220	221	221	222	222
5	212	218	226	235	248	261	275	289	302	316	331	346	361	374	386	395	403	408	411
10	212	229	253	283	319	362	411	470	532	595	652	706	756	804	846	881	908	927	936
15	220	245	288	348	433	530	637	743	853	963	1075	1183	1287	1383	1469	1543	1608	1654	1677
20	217	275	354	453	578	720	873	1032	1195	1361	1535	1698	1843	1942	2018	2076	2136	2178	2199
25	218	300	412	555	746	955	1171	1369	1558	1736	1903	2049	2167	2233	2273	2296	2322	2339	2347
30	205	311	451	624	850	1095	1345	1594	1815	1990	2056	2069	2045	1995	1934	1875	1851	1841	1843
35	212	311	453	640	908	1191	1462	1672	1828	1915	1855	1746	1625	1575	1542	1524	1517	1517	1521
40	196	299	450	649	956	1266	1534	1637	1668	1641	1552	1445	1349	1345	1365	1393	1393	1389	1384
45	184	337	508	698	950	1187	1375	1403	1375	1318	1283	1249	1223	1220	1227	1239	1255	1270	1279
50	161	315	475	643	851	1041	1189	1205	1179	1134	1129	1131	1142	1172	1206	1237	1251	1258	1260
55	127	297	456	606	759	891	995	1027	1035	1031	1045	1064	1087	1125	1165	1201	1219	1229	1230
60	96.9	252	394	524	644	749	838	898	943	978	1009	1037	1066	1112	1157	1196	1213	1221	1219
65	70.3	185	295	403	508	609	704	796	878	948	990	1023	1054	1106	1156	1199	1217	1224	1221
70	48.9	107	179	262	363	473	588	709	823	921	975	1013	1045	1096	1144	1183	1200	1207	1203
75	29.9	56.7	106	178	284	404	531	658	774	870	913	936	949	976	999	1016	1018	1015	1009
80	15.5	29.3	67.7	131	237	353	468	553	618	660	656	635	607	598	592	587	580	574	571
85	9.83	24.8	50.4	86.8	146	207	260	281	288	285	272	256	241	238	237	238	236	235	234
90	4.99	8.99	17.0	29.1	48.6	69.6	89.4	102	110	116	115	112	110	112	116	120	122	123	124
95	3.87	5.88	9.85	15.8	24.2	34.2	45.2	58.1	70.3	80.5	83.6	84.8	85.5	90.1	95.0	99.4	102	103	103
100	3.46	5.58	8.30	11.6	15.2	19.7	25.3	33.9	43.0	51.6	56.6	60.6	64.1	69.0	73.5	77.4	79.5	80.6	80.9
105	3.38	5.11	7.20	9.66	12.6	15.8	19.2	22.3	25.6	29.2	33.4	37.9	42.6	47.7	52.4	56.2	58.0	58.9	58.9
110	2.78	4.02	5.72	7.90	11.0	14.2	17.3	19.2	20.9	22.7	25.2	27.8	30.2	32.2	33.8	35.0	35.5	35.6	35.5
115	2.32	3.31	4.78	6.73	9.57	12.6	15.4	17.1	18.6	19.9	21.7	23.5	25.3	27.1	28.8	30.1	30.3	30.1	29.8
120	2.04	2.97	4.15	5.58	7.24	9.16	11.4	14.3	17.2	19.8	20.9	21.6	22.2	23.4	24.7	25.7	25.9	25.9	25.8
125	1.87	2.41	3.26	4.39	5.74	7.44	9.57	12.9	16.2	19.2	20.5	21.1	21.5	22.1	22.5	22.8	22.7	22.5	22.4
130	1.69	1.92	2.49	3.39	4.76	6.38	8.13	9.63	11.3	13.3	16.7	20.1	22.8	23.3	23.0	22.4	22.1	21.9	21.7
135	1.51	1.54	1.92	2.62	3.88	5.30	6.74	7.57	8.42	9.45	11.0	12.9	15.3	18.9	22.6	26.0	28.0	29.3	29.7
140	1.35	1.25	1.46	1.96	2.96	4.12	5.30	6.10	6.83	7.57	8.52	9.49	10.4	11.3	12.0	12.6	12.9	13.1	13.1
145	1.19	0.85	0.84	1.15	1.97	2.97	4.01	4.68	5.29	5.88	6.64	7.39	8.10	8.71	9.22	9.59	9.71	9.72	9.66
150	1.03	0.72	0.65	0.83	1.38	2.08	2.85	3.47	4.07	4.64	5.20	5.72	6.20	6.64	7.01	7.30	7.44	7.51	7.50
155	0.89	0.72	0.67	0.76	1.00	1.35	1.80	2.35	2.92	3.48	3.93	4.31	4.62	4.82	4.95	5.03	5.06	5.06	5.04
160	0.81	0.77	0.75	0.74	0.69	0.70	0.80	1.16	1.60	2.07	2.43	2.76	3.04	3.28	3.47	3.60	3.64	3.64	3.62
165	0.73	0.72	0.71	0.69	0.66	0.64	0.63	0.62	0.65	0.72	0.92	1.15	1.39	1.57	1.72	1.85	1.92	1.96	1.99
170	0.69	0.68	0.67	0.65	0.63	0.61	0.59	0.56	0.54	0.51	0.49	0.47	0.45	0.43	0.42	0.41	0.41	0.41	0.42
175	0.72	0.72	0.71	0.70	0.69	0.68	0.66	0.65	0.63	0.61	0.60	0.58	0.56	0.55	0.53	0.52	0.52	0.52	0.53
180	0.78	0.78	0.78	0.77	0.76	0.75	0.74	0.73	0.72	0.70	0.69	0.67	0.66	0.64	0.63	0.63	0.63	0.64	0.65

UNIT: cd																			
C (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
y (DEG)	0	222	221	221	221	220	219	218	217	216	215	214	214	212	211	211	210	210	213
5	408	403	395	386	374	361	346	331	316	302	289	275	261	248	235	226	218	212	215
10	927	908	881	846	804	756	706	652	595	532	470	411	362	319	283	253	229	212	177
15	1654	1608	1543	1469	1383	1287	1183	1075	963	853	743	637	530	433	348	288	245	220	159
20	2178	2136	2076	2018	1942	1843	1698	1535	1361	1195	1032	873	720	578	453	354	275	217	146
25	2339	2322	2296	2273	2233	2167	2049	1903	1736	1558	1369	1171	955	746	555	412	300	218	137
30	1841	1851	1875	1934	1995	2045	2069	2056	1990	1815	1594	1345	1095	850	624	451	311	205	130
35	1517	1517	1524	1542	1575	1625	1746	1855	1915	1828	1672	1462	1191	908	640	453	311	212	155
40	1389	1393	1393	1365	1345	1349	1445	1552	1641	1668	1637	1534	1266	956	649	450	299	196	162
45	1270	1255	1239	1227	1220	1223	1249	1283	1318	1375	1403	1375	1187	950	698	508	337	184	164
50	1258	1251	1237	1206	1172	1142	1131	1129	1134	1179	1205	1189	1041	851	643	475	315	161	149
55	1229	1219	1201	1165	1125	1087	1064	1045	1031	1035	1027	995	891	759	606	456	297	127	118
60	1221	1213	1196	1157	1112	1066	1037	1009	978	943	898	838	749	644	524	394	252	96.9	98.7
65	1224	1217	1199	1156	1106	1054	1023	990	948	878	796	704	609	508	403	295	185	70.3	72.8
70	1207	1200	1183	1144	1096	1045	1013	975	921	823	709	588	473	363	262	179	107	48.9	45.8
75	1015	1018	1016	999	976	949	936	913	870	774	658	531	404	284	178	106	56.7	29.9	27.5
80	574	580	587	592	598	607	635	656	660	618	553	468	353	237	131	67.7	29.3	15.5	14.9
85	235	236	238	237	238	241	256	272	285	288	281	260	207	146	86.8	50.4	24.8	9.83	10.1
90	123	122	120	116	112	110	112	115	116	110	102	89.4	69.6	48.6	29.1	17.0	8.99	4.99	4.88
95	103	102	99.4	95.0	90.1	85.5	84.8	83.6	80.5	70.3	58.1	45.2	34.2	24.2	15.8	9.85	5.88	3.87	3.91
100	80.6	79.5	77.4	73.5	69.0	64.1	60.6	56.6	51.6	43.0	33.9	25.3	19.7	15.2	11.6	8.30	5.58	3.46	3.32
105	58.9	58.0	56.2	52.4	47.7	42.6	37.9	33.4	29.2	25.6	22.3	19.2	15.8	12.6	9.66	7.20	5.11	3.38	3.29
110	35.6	35.5	35.0	33.8	32.2	30.2	27.8	25.2	22.7	20.9	19.2	17.3	14.2	11.0	7.90	5.72	4.02	2.78	2.99
115	30.1	30.3	30.1	28.8	27.1	25.3	23.5	21.7	19.9	18.6	17.1	15.4	12.6	9.57	6.73	4.78	3.31	2.32	2.90
120	25.9	25.9	25.7	24.7	23.4	22.2	21.6	20.9	19.8	17.2	14.3	11.4	9.16	7.24	5.58	4.15	2.97	2.04	2.89
125	22.5	22.7	22.8	22.5	22.1	21.5	21.1	20.5	19.2	16.2	12.9	9.57	7.44	5.74	4.39	3.26	2.41	1.87	2.62
130	21.9	22.1	22.4	23.0	23.3	22.8	20.1	16.7	13.3	11.3	9.63	8.13	6.38	4.76	3.39	2.49	1.92	1.69	1.99
135	29.3	28.0	26.0	22.6	18.9	15.3	12.9	11.0	9.45	8.42	7.57	6.74	5.30	3.88	2.62	1.92	1.54	1.51	1.68
140	13.1	12.9	12.6	12.0	11.3	10.4	9.49	8.52	7.57	6.83	6.10	5.30	4.12	2.96	1.96	1.46	1.25	1.31	1.46
145	9.72	9.71	9.59	9.22	8.71	8.10	7.39	6.64	5.88	5.29	4.68	4.01	2.97	1.97	1.15	0.84	0.85	1.19	1.22
150	7.51	7.44	7.30	7.01	6.64	6.20	5.72	5.20	4.64	4.07	3.47	2.85	2.08	1.38	0.83	0.65	0.72	1.03	1.11
155	5.06	5.06	5.03	4.95	4.82	4.62	4.31	3.93	3.48	2.92	2.35	1.80	1.35	1.00	0.76	0.67	0.72	0.89	1.00
160	3.64	3.64	3.60	3.47	3.28	3.04	2.76	2.43	2.07	1.60	1.16	0.80	0.70	0.69	0.74	0.75	0.77	0.81	0.99
165	1.96	1.92	1.85	1.72	1.57	1.39	1.15	0.92	0.72	0.65	0.62	0.63	0.64	0.66	0.69	0.71	0.72	0.73	0.88
170	0.41	0.41	0.41	0.42	0.43	0.45	0.47	0.49	0.51	0.54	0.56	0.59	0.61	0.63	0.65	0.67	0.68	0.69	0.77
175	0.52	0.52	0.52	0.53	0.55	0.56	0.58	0.60	0.61	0.63	0.65	0.66	0.68	0.69	0.70	0.71	0.72	0.72	0.78
180	0.64	0.63	0.63	0.63	0.64	0.66	0.67	0.69	0.70	0.72	0.73	0.74	0.75	0.76	0.77	0.78	0.78	0.78	0.77

Table--3 UNIT: cd

C (DEG) γ (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	215	216	217	217	217	217	218	219	219	220	221	221	222	222	222	222	222	222	222
5	212	202	182	158	133	112	94.3	80.0	73.3	69.9	68.6	67.0	66.0	65.4	64.6	64.1	63.8	64.1	64.6
10	146	120	97.5	79.3	65.2	55.1	49.0	46.7	49.3	54.9	62.8	73.1	83.8	93.5	98.9	102	104	102	98.9
15	112	77.5	57.6	50.0	53.8	73.1	98.3	125	143	158	168	170	169	168	172	177	180	177	172
20	95.8	67.1	67.9	83.6	108	132	154	170	166	156	142	132	122	115	112	111	112	111	112
25	83.5	58.2	79.3	115	151	150	141	129	126	123	120	112	104	96.3	92.6	90.6	90.3	90.6	92.6
30	83.0	65.0	97.1	142	183	173	151	123	108	94.9	84.5	77.6	72.7	69.2	65.3	62.2	60.5	62.2	65.3
35	115	92.3	98.0	113	128	120	107	91.8	78.3	65.6	55.0	49.8	46.8	45.4	43.7	42.7	42.5	42.7	43.7
40	136	120	120	123	125	108	86.6	65.5	53.5	44.2	37.1	30.8	26.0	22.6	21.1	20.6	20.8	20.6	21.1
45	146	131	118	106	94.3	79.4	64.5	50.6	39.8	30.8	23.4	17.8	13.7	10.8	9.16	8.38	8.33	8.38	9.16
50	136	121	103	85.0	67.4	52.9	40.2	29.4	20.8	14.0	9.05	6.10	4.44	3.67	3.06	2.85	2.91	2.85	3.06
55	108	95.8	81.4	66.3	51.3	37.3	24.8	14.7	9.60	6.71	5.27	3.59	2.46	1.80	1.49	1.43	1.52	1.43	1.49
60	95.4	86.9	69.0	49.0	30.0	20.4	14.1	10.2	7.10	5.10	3.85	2.54	1.58	0.96	0.72	0.70	0.80	0.70	0.72
65	70.8	64.2	49.4	32.8	17.5	11.6	8.72	7.54	5.52	3.98	2.79	1.74	0.94	0.40	0.21	0.20	0.29	0.20	0.21
70	41.5	36.1	28.2	20.2	13.0	9.46	7.21	5.81	4.26	3.04	2.08	1.24	0.60	0.18	0.06	0.08	0.17	0.08	0.06
75	24.6	21.4	17.2	12.9	9.14	7.03	5.54	4.48	3.40	2.51	1.78	1.13	0.63	0.28	0.19	0.21	0.28	0.21	0.19
80	13.9	12.6	10.8	8.75	6.85	5.63	4.66	3.85	3.03	2.30	1.67	1.14	0.73	0.44	0.37	0.38	0.44	0.38	0.37
85	9.98	9.39	8.04	6.49	4.97	4.18	3.58	3.09	2.50	1.96	1.49	1.11	0.81	0.61	0.56	0.58	0.62	0.58	0.56
90	4.68	4.39	3.96	3.49	3.03	2.72	2.45	2.19	1.85	1.53	1.24	1.04	0.89	0.79	0.77	0.78	0.80	0.78	0.77
95	3.83	3.64	3.27	2.84	2.41	2.13	1.90	1.70	1.47	1.27	1.10	1.01	0.95	0.93	0.92	0.93	0.94	0.93	0.92
100	3.15	2.95	2.70	2.43	2.17	1.95	1.74	1.55	1.37	1.22	1.10	1.05	1.02	1.02	1.02	1.03	1.04	1.03	1.02
105	3.14	2.94	2.63	2.31	2.00	1.80	1.65	1.52	1.37	1.24	1.14	1.10	1.08	1.09	1.09	1.10	1.11	1.10	1.09
110	3.06	2.98	2.67	2.28	1.90	1.71	1.58	1.48	1.34	1.23	1.14	1.10	1.09	1.09	1.09	1.10	1.10	1.10	1.09
115	3.22	3.27	2.88	2.36	1.83	1.64	1.53	1.47	1.34	1.23	1.14	1.10	1.09	1.09	1.09	1.09	1.09	1.09	1.09
120	3.38	3.51	3.05	2.41	1.75	1.56	1.48	1.45	1.34	1.24	1.16	1.12	1.10	1.10	1.09	1.09	1.09	1.09	1.09
125	3.07	3.21	2.84	2.32	1.77	1.60	1.51	1.48	1.38	1.30	1.23	1.20	1.19	1.18	1.18	1.17	1.17	1.17	1.18
130	2.17	2.24	2.13	1.95	1.75	1.64	1.56	1.49	1.42	1.36	1.31	1.30	1.30	1.30	1.30	1.29	1.29	1.29	1.30
135	1.80	1.86	1.83	1.76	1.67	1.59	1.52	1.45	1.40	1.37	1.34	1.34	1.35	1.37	1.37	1.37	1.37	1.37	1.37
140	1.59	1.66	1.67	1.65	1.60	1.53	1.45	1.37	1.34	1.32	1.32	1.33	1.35	1.38	1.39	1.39	1.39	1.39	1.39
145	1.37	1.41	1.41	1.39	1.35	1.32	1.29	1.27	1.26	1.26	1.27	1.29	1.32	1.34	1.35	1.36	1.36	1.36	1.35
150	1.25	1.31	1.30	1.28	1.24	1.22	1.20	1.19	1.19	1.20	1.22	1.24	1.26	1.27	1.28	1.29	1.29	1.29	1.28
155	1.15	1.21	1.21	1.18	1.14	1.13	1.12	1.11	1.12	1.13	1.14	1.15	1.15	1.16	1.16	1.16	1.15	1.16	1.16
160	1.06	1.13	1.13	1.10	1.07	1.07	1.07	1.08	1.08	1.08	1.08	1.07	1.06	1.05	1.03	1.02	0.99	1.02	1.03
165	0.94	1.00	1.01	1.00	0.98	0.99	0.99	1.00	0.99	0.98	0.96	0.93	0.90	0.88	0.85	0.83	0.81	0.83	0.85
170	0.82	0.85	0.86	0.85	0.84	0.84	0.84	0.84	0.81	0.77	0.73	0.68	0.64	0.60	0.58	0.57	0.57	0.57	0.58
175	0.79	0.81	0.82	0.81	0.81	0.80	0.79	0.77	0.73	0.69	0.66	0.63	0.60	0.59	0.58	0.58	0.59	0.58	0.58
180	0.74	0.73	0.72	0.72	0.73	0.73	0.73	0.73	0.73	0.72	0.70	0.68	0.66	0.65	0.64	0.63	0.63	0.63	0.64

C (DEG) γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	222	222	221	221	220	219	219	218	217	217	217	217	216	215	213				
5	65.4	66.0	67.0	68.6	69.9	73.3	80.0	94.3	112	133	158	182	202	212	215				
10	93.5	83.8	73.1	62.8	54.9	49.3	46.7	49.0	55.1	65.2	79.3	97.5	120	146	177				
15	168	169	170	168	158	143	125	98.3	73.1	53.8	50.0	57.6	77.5	112	159				
20	115	122	132	142	156	166	170	154	132	108	83.6	67.9	67.1	95.8	146				
25	96.3	104	112	120	123	126	129	141	150	151	115	79.3	58.2	83.5	137				
30	69.2	72.7	77.6	84.5	94.9	108	123	151	173	183	142	97.1	65.0	83.0	130				
35	45.4	46.8	49.8	55.0	65.6	78.3	91.8	107	120	128	113	98.0	92.3	115	155				
40	22.6	26.0	30.8	37.1	44.2	53.5	65.5	86.6	108	125	123	120	120	136	162				
45	10.8	13.7	17.8	23.4	30.8	39.8	50.6	64.5	79.4	94.3	106	118	131	146	164				
50	3.67	4.44	6.10	9.05	14.0	20.8	29.4	40.2	52.9	67.4	85.0	103	121	136	149				
55	1.80	2.46	3.59	5.27	6.71	9.60	14.7	24.8	37.3	51.3	66.3	81.4	95.8	108	118				
60	0.96	1.58	2.54	3.85	5.10	7.10	10.2	14.1	20.4	30.0	49.0	69.0	86.9	95.4	98.7				
65	0.40	0.94	1.74	2.79	3.98	5.52	7.54	8.72	11.6	17.5	32.8	49.4	64.2	70.8	72.8				
70	0.18	0.60	1.24	2.08	3.04	4.26	5.81	7.21	9.46	13.0	20.2	28.2	36.1	41.5	45.8				
75	0.28	0.63	1.13	1.78	2.51	3.40	4.48	5.54	7.03	9.14	12.9	17.2	21.4	24.6	27.5				
80	0.44	0.73	1.14	1.67	2.30	3.03	3.85	4.66	5.63	6.85	8.75	10.8	12.6	13.9	14.9				
85	0.61	0.81	1.11	1.49	1.96	2.50	3.09	3.58	4.18	4.97	6.49	8.04	9.39	9.98	10.1				
90	0.79	0.89	1.04	1.24	1.53	1.85	2.19	2.45	2.72	3.03	3.49	3.96	4.39	4.68	4.88				
95	0.93	0.95	1.01	1.10	1.27	1.47	1.70	1.90	2.13	2.41	2.84	3.27	3.64	3.83	3.91				
100	1.02	1.02	1.05	1.10	1.22	1.37	1.55	1.74	1.95	2.17	2.43	2.70	2.95	3.15	3.32				
105	1.09	1.08	1.10	1.14	1.24	1.37	1.52	1.65	1.80	2.00	2.31	2.63	2.94	3.14	3.29				
110	1.09	1.09	1.10	1.14	1.23	1.34	1.48	1.58	1.71	1.90	2.28	2.67	2.98	3.06	2.99				
115	1.09	1.09	1.10	1.14	1.23	1.34	1.47	1.53	1.64	1.83	2.36	2.88	3.27	3.22	2.90				
120	1.10	1.10	1.12	1.16	1.24	1.34	1.45	1.48	1.56	1.75	2.41	3.05	3.51	3.38	2.89				
125	1.18	1.19	1.20	1.23	1.30	1.38	1.48	1.51	1.60	1.77	2.32	2.84	3.21	3.07	2.62				
130	1.30	1.30	1.30	1.31	1.36	1.42	1.49	1.56	1.64	1.75	1.95	2.13	2.24	2.17	1.99				
135	1.37	1.35	1.34	1.34	1.37	1.40	1.45	1.52	1.59	1.67	1.76	1.83	1.86	1.80	1.68				
140	1.38	1.35	1.33	1.32	1.32	1.34	1.37	1.45	1.53	1.60	1.65	1.67	1.66	1.59	1.49				
145	1.34	1.32	1.29	1.27	1.26	1.26	1.27	1.29	1.32	1.35	1.39	1.41	1.41	1.37	1.29				
150	1.27	1.26	1.24	1.22	1.20	1.19	1.19	1.20	1.22	1.24	1.28	1.30	1.31	1.25	1.16				
155	1.16	1.15	1.15	1.14	1.13	1.12	1.11	1.12	1.13	1.14	1.18	1.21	1.21	1.15	1.04				
160	1.05	1.06	1.07	1.08	1.08	1.08	1.08	1.07	1.07	1.07	1.10	1.13	1.13	1.06	0.96				
165	0.88	0.90	0.93	0.96	0.98	0.99	1.00	0.99	0.99	0.98	1.00	1.01	1.00	0.94	0.85				
170	0.60	0.64	0.68	0.73	0.77	0.81	0.84	0.84	0.84	0.84	0.85	0.86	0.85	0.82	0.76				
175	0.59	0.60	0.63	0.66	0.69	0.73	0.77	0.79	0.80	0.81	0.81	0.82	0.81	0.79	0.76				
180	0.65	0.66	0.68	0.70	0.72	0.73	0.73	0.73	0.73	0.73	0.72	0.72	0.73	0.74	0.76				

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	W34S @ 17W / 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	0.159	18.8	0.987	2.80
277.0	60	0.088	19.2	0.787	15.34

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*****