

## Photometric Test Report

### Relevant Standards

- ☒ ANSI/IES LM-79-2019
- ☒ ANSI C82.77-2017

Prepared For

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## 1.0 Test Summary

DLC Technical Requirements V5.1

Architectural Flood and Spot Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	1000		1028
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	133.5
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		7.7
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	13.50
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	0.9	120V	0.971
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019	7 steps	3465±245	3454
		4 steps	3465±124	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥70		83.7
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79-2019 CIE13.3-1995	N/A		19
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		84
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		98
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-11%
Zonal Lumen Requirement (0°-90°) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	≥85%		100.0%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Cast		120.0
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Input Current (A)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		0.066
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		7.7
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Build Level	Sample No.
1	Integrating Sphere Test	2024-08-14	LF34SW @3500K	ES#1	240812012-S1
2	Goniophotometer Test	2024-08-14	LF34SW @3500K	ES#1	240812012-S1
3	THD and PF Test	2024-08-14	LF34SW @3500K	ES#1	240812012-S1

### Remark (If any):

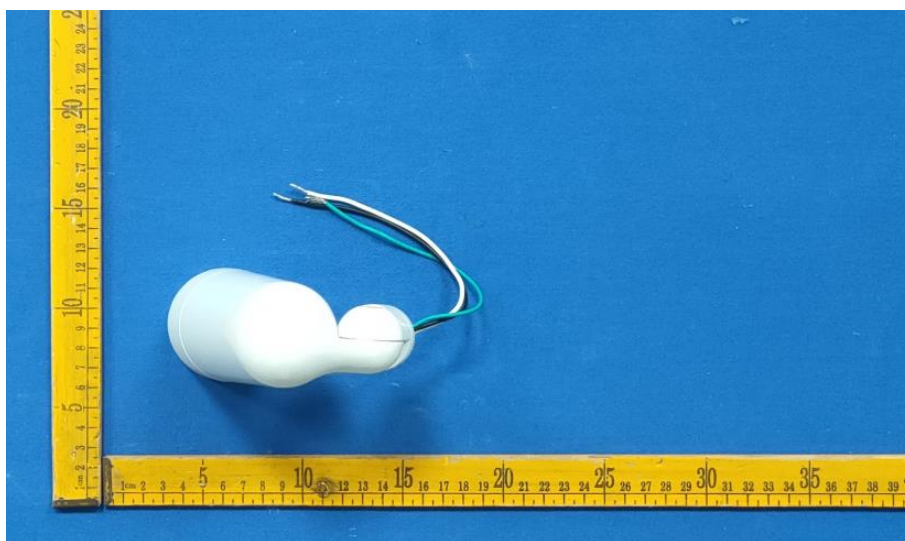
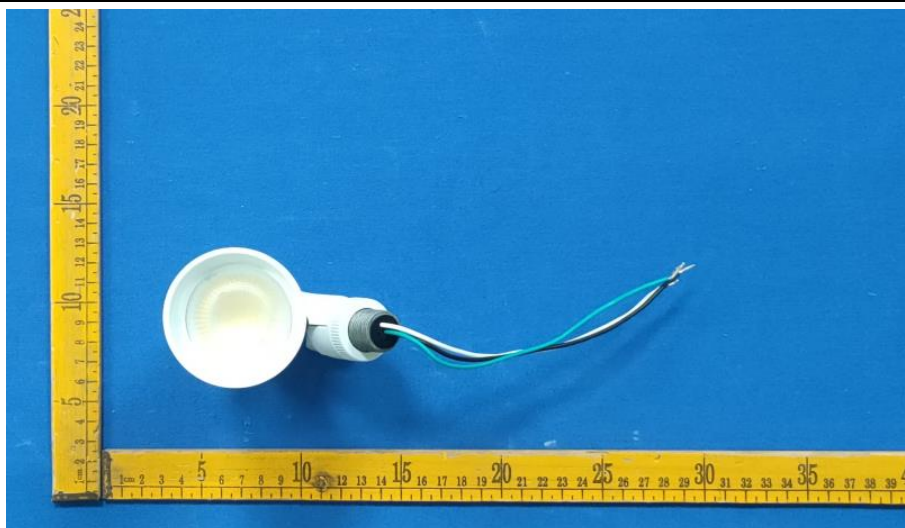
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3. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

### 3.0 Product Description

Luminaire Description: Model No. LF34SW @3500K, color tunable from 2700K, 3000K, 3500K, 4000K and 5000K.

Electrical Specification: 120Vac, 50/60Hz

Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

<b>Model No.</b>	LF34SW @3500K	<b>Sample ID</b>	240812012-S1
<b>Operate time (Min.)</b>	10	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

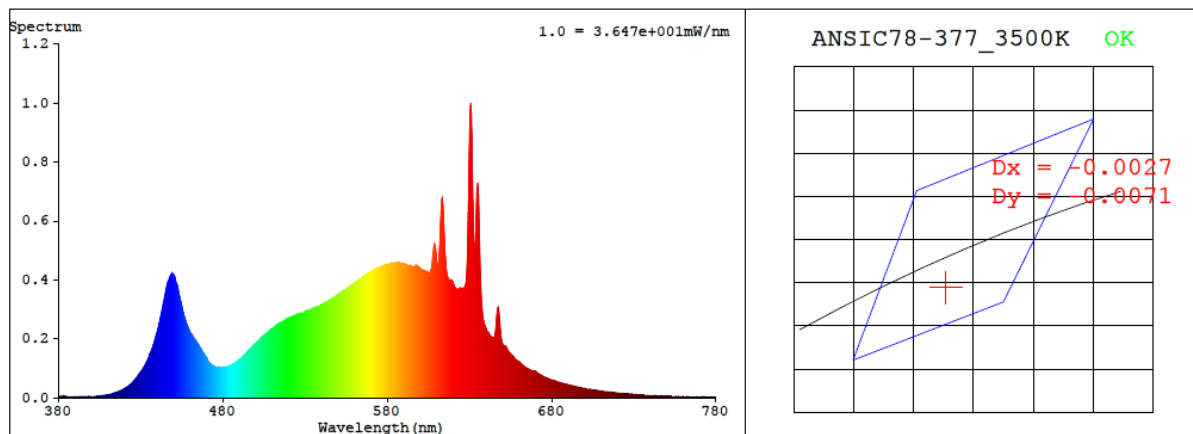
<b>Test Method</b>
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were 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

<b>Voltage (Vac)</b>	<b>Frequency (Hz)</b>	<b>Current (A)</b>	<b>Power (W)</b>	<b>Power Factor</b>
120.0	60	0.066	7.7	0.971

<b>CCT (K)</b>	<b>CRI</b>	<b>R9</b>	<b>Duv</b>	<b>Rf</b>	<b>Rg</b>	<b>IES Rcs,h1</b>
3454	83.7	19	-0.0026	84	98	-11%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.4052$   $y = 0.3849$  /  $u' = 0.2381$   $v' = 0.5088$  ( $duv = -2.55e-03$ )

CCT= 3454K Prcp WL:  $L_d = 582.2nm$  Purity=37.1%

Peak WL:  $L_p = 631nm$  FWHM:  $= 7.7nm$  Ratio: R=20.8% G=76.3% B=2.9%

Render Index:  $R_a = 83.7$  AvgR = 78.1 TM30:  $R_f = 83$   $R_g = 98$

EEL: 0.10446 A++ Highest

R1 =83 R2 =90 R3 =94 R4 =82 R5 =82 R6 =86 R7 =86

R8 =67 R9 =19 R10=75 R11=81 R12=68 R13=84 R14=97 R15=78

## 4.1 Integrating Sphere Test

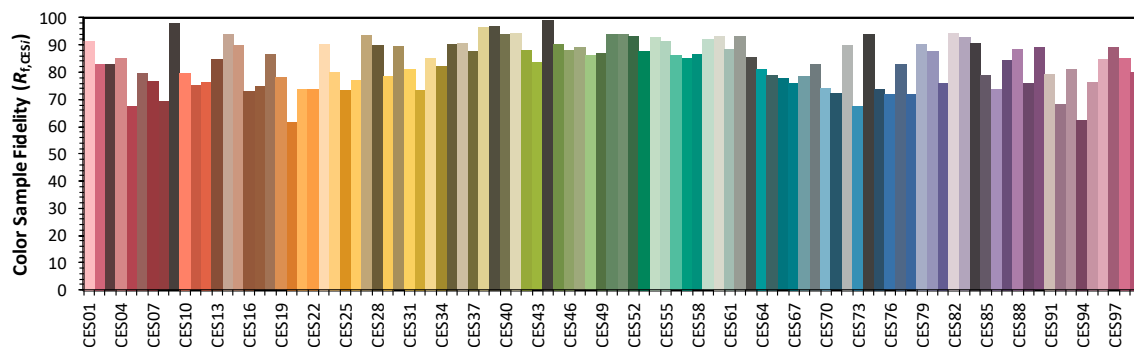
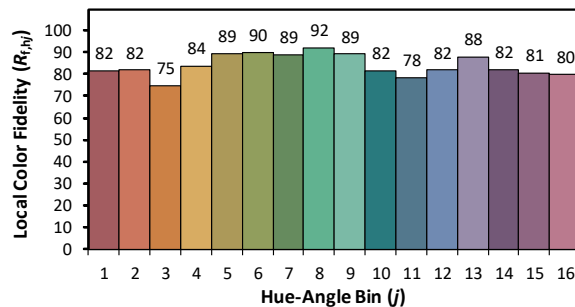
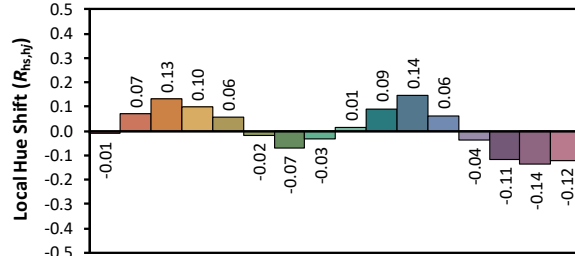
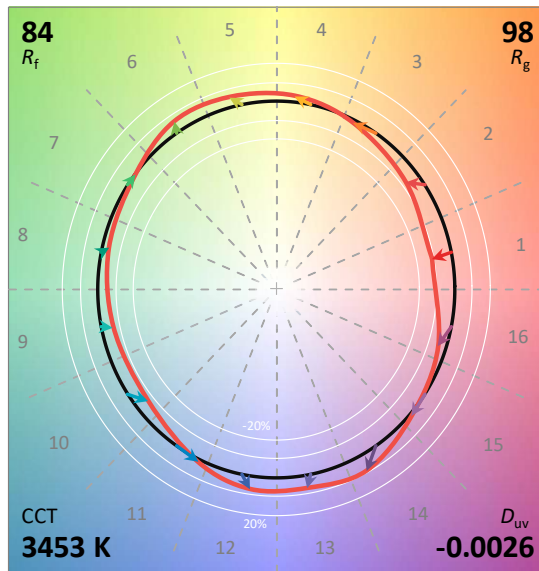
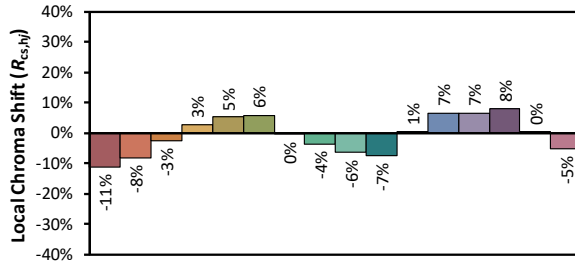
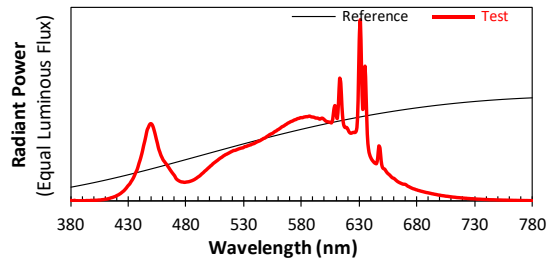
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/8/15

Model: LF34SW @3500K



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

$x$  0.4052  
 $y$  0.3847  
 $u'$  0.2381  
 $v'$  0.5087

CIE 13.3-1995  
(CRI)

$R_a$  84  
 $R_g$  19



## 4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	4.30E-06	447	3.97E-04	514	2.51E-04	581	4.51E-04	648	2.85E-04	715	1.91E-05
381	2.60E-06	448	4.11E-04	515	2.54E-04	582	4.54E-04	649	2.18E-04	716	1.88E-05
382	1.50E-06	449	4.18E-04	516	2.57E-04	583	4.55E-04	650	1.85E-04	717	1.83E-05
383	4.80E-06	450	4.16E-04	517	2.60E-04	584	4.56E-04	651	1.76E-04	718	1.77E-05
384	1.80E-06	451	4.05E-04	518	2.64E-04	585	4.56E-04	652	1.73E-04	719	1.72E-05
385	2.20E-06	452	3.85E-04	519	2.67E-04	586	4.58E-04	653	1.64E-04	720	1.65E-05
386	2.00E-06	453	3.62E-04	520	2.70E-04	587	4.59E-04	654	1.55E-04	721	1.60E-05
387	1.80E-06	454	3.35E-04	521	2.73E-04	588	4.56E-04	655	1.48E-04	722	1.54E-05
388	2.00E-06	455	3.11E-04	522	2.74E-04	589	4.55E-04	656	1.43E-04	723	1.52E-05
389	1.70E-06	456	2.84E-04	523	2.76E-04	590	4.54E-04	657	1.37E-04	724	1.42E-05
390	2.60E-06	457	2.66E-04	524	2.79E-04	591	4.52E-04	658	1.30E-04	725	1.40E-05
391	2.60E-06	458	2.48E-04	525	2.81E-04	592	4.49E-04	659	1.25E-04	726	1.35E-05
392	1.30E-06	459	2.35E-04	526	2.83E-04	593	4.49E-04	660	1.23E-04	727	1.28E-05
393	3.00E-06	460	2.22E-04	527	2.85E-04	594	4.48E-04	661	1.18E-04	728	1.29E-05
394	2.90E-06	461	2.14E-04	528	2.87E-04	595	4.45E-04	662	1.12E-04	729	1.24E-05
395	3.00E-06	462	2.05E-04	529	2.88E-04	596	4.43E-04	663	1.07E-04	730	1.19E-05
396	2.70E-06	463	1.98E-04	530	2.91E-04	597	4.47E-04	664	1.03E-04	731	1.14E-05
397	3.80E-06	464	1.88E-04	531	2.95E-04	598	4.48E-04	665	9.96E-05	732	1.10E-05
398	4.00E-06	465	1.79E-04	532	2.95E-04	599	4.44E-04	666	9.68E-05	733	1.06E-05
399	3.60E-06	466	1.69E-04	533	2.98E-04	600	4.38E-04	667	9.40E-05	734	1.04E-05
400	4.10E-06	467	1.60E-04	534	3.00E-04	601	4.33E-04	668	9.18E-05	735	1.02E-05
401	4.60E-06	468	1.52E-04	535	3.03E-04	602	4.30E-04	669	9.12E-05	736	9.70E-06
402	4.60E-06	469	1.44E-04	536	3.04E-04	603	4.28E-04	670	9.01E-05	737	9.40E-06
403	5.00E-06	470	1.35E-04	537	3.08E-04	604	4.27E-04	671	8.62E-05	738	9.10E-06
404	5.90E-06	471	1.23E-04	538	3.10E-04	605	4.25E-04	672	8.11E-05	739	8.80E-06
405	5.90E-06	472	1.17E-04	539	3.12E-04	606	4.23E-04	673	7.83E-05	740	8.60E-06
406	6.40E-06	473	1.12E-04	540	3.15E-04	607	4.42E-04	674	7.50E-05	741	8.30E-06
407	7.80E-06	474	1.08E-04	541	3.19E-04	608	4.95E-04	675	7.18E-05	742	8.00E-06
408	8.00E-06	475	1.06E-04	542	3.22E-04	609	5.15E-04	676	6.90E-05	743	7.50E-06
409	9.30E-06	476	1.04E-04	543	3.24E-04	610	4.69E-04	677	6.64E-05	744	7.40E-06
410	1.04E-05	477	1.03E-04	544	3.27E-04	611	4.49E-04	678	6.50E-05	745	7.20E-06
411	1.10E-05	478	1.02E-04	545	3.31E-04	612	5.31E-04	679	6.20E-05	746	7.20E-06
412	1.26E-05	479	1.02E-04	546	3.34E-04	613	6.62E-04	680	6.06E-05	747	7.00E-06
413	1.41E-05	480	1.03E-04	547	3.39E-04	614	6.37E-04	681	5.81E-05	748	6.70E-06
414	1.62E-05	481	1.04E-04	548	3.40E-04	615	5.11E-04	682	5.67E-05	749	6.40E-06
415	1.84E-05	482	1.05E-04	549	3.45E-04	616	4.31E-04	683	5.47E-05	750	6.00E-06
416	1.97E-05	483	1.06E-04	550	3.49E-04	617	4.03E-04	684	5.30E-05	751	6.00E-06
417	2.24E-05	484	1.08E-04	551	3.53E-04	618	3.97E-04	685	5.16E-05	752	5.90E-06
418	2.42E-05	485	1.11E-04	552	3.58E-04	619	3.98E-04	686	4.99E-05	753	5.70E-06
419	2.73E-05	486	1.14E-04	553	3.61E-04	620	3.89E-04	687	4.83E-05	754	5.50E-06
420	3.08E-05	487	1.17E-04	554	3.64E-04	621	3.76E-04	688	4.67E-05	755	5.30E-06
421	3.35E-05	488	1.21E-04	555	3.67E-04	622	3.68E-04	689	4.57E-05	756	5.20E-06
422	3.74E-05	489	1.25E-04	556	3.72E-04	623	3.67E-04	690	4.44E-05	757	5.20E-06
423	4.14E-05	490	1.30E-04	557	3.76E-04	624	3.69E-04	691	4.30E-05	758	4.90E-06
424	4.65E-05	491	1.33E-04	558	3.79E-04	625	3.71E-04	692	4.16E-05	759	4.90E-06
425	5.15E-05	492	1.38E-04	559	3.84E-04	626	3.71E-04	693	4.00E-05	760	4.60E-06
426	5.67E-05	493	1.44E-04	560	3.88E-04	627	3.74E-04	694	3.90E-05	761	4.50E-06
427	6.36E-05	494	1.50E-04	561	3.92E-04	628	3.98E-04	695	3.75E-05	762	4.40E-06
428	7.08E-05	495	1.55E-04	562	3.97E-04	629	5.43E-04	696	3.64E-05	763	4.30E-06
429	7.94E-05	496	1.62E-04	563	4.02E-04	630	8.69E-04	697	3.53E-05	764	4.00E-06
430	8.67E-05	497	1.67E-04	564	4.04E-04	631	9.77E-04	698	3.38E-05	765	4.00E-06
431	9.33E-05	498	1.72E-04	565	4.08E-04	632	7.06E-04	699	3.27E-05	766	4.00E-06
432	1.04E-04	499	1.78E-04	566	4.13E-04	633	4.97E-04	700	3.20E-05	767	3.70E-06
433	1.13E-04	500	1.84E-04	567	4.16E-04	634	5.99E-04	701	3.05E-05	768	3.70E-06
434	1.24E-04	501	1.90E-04	568	4.21E-04	635	7.29E-04	702	2.96E-05	769	3.50E-06
435	1.37E-04	502	1.94E-04	569	4.24E-04	636	5.60E-04	703	2.89E-05	770	3.40E-06
436	1.52E-04	503	2.01E-04	570	4.27E-04	637	3.62E-04	704	2.79E-05	771	3.30E-06
437	1.65E-04	504	2.06E-04	571	4.30E-04	638	2.84E-04	705	2.67E-05	772	3.10E-06
438	1.82E-04	505	2.11E-04	572	4.32E-04	639	2.52E-04	706	2.62E-05	773	3.20E-06
439	2.04E-04	506	2.16E-04	573	4.36E-04	640	2.35E-04	707	2.55E-05	774	2.90E-06
440	2.23E-04	507	2.20E-04	574	4.39E-04	641	2.23E-04	708	2.45E-05	775	3.00E-06
441	2.46E-04	508	2.25E-04	575	4.41E-04	642	2.15E-04	709	2.37E-05	776	2.90E-06
442	2.70E-04	509	2.30E-04	576	4.44E-04	643	2.08E-04	710	2.28E-05	777	2.70E-06
443	3.00E-04	510	2.34E-04	577	4.46E-04	644	2.04E-04	711	2.20E-05	778	2.60E-06
444	3.25E-04	511	2.38E-04	578	4.48E-04	645	2.03E-04	712	2.13E-05	779	2.60E-06
445	3.53E-04	512	2.43E-04	579	4.51E-04	646	2.33E-04	713	2.08E-05	780	2.60E-06
446	3.83E-04	513	2.47E-04	580	4.51E-04	647	2.97E-04	714	1.99E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	LF34SW @3500K	<b>Sample ID</b>	240812012-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.0	<b>Humidity (%RH)</b>	44.8

<b>Test Method</b>
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at <math>25 \pm 1^\circ\text{C}</math>, 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 <math>\pm 0.2</math> 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 <math>1.0^\circ</math> vertical intervals and <math>15^\circ</math> horizontal intervals.</p>

### Test Conditions

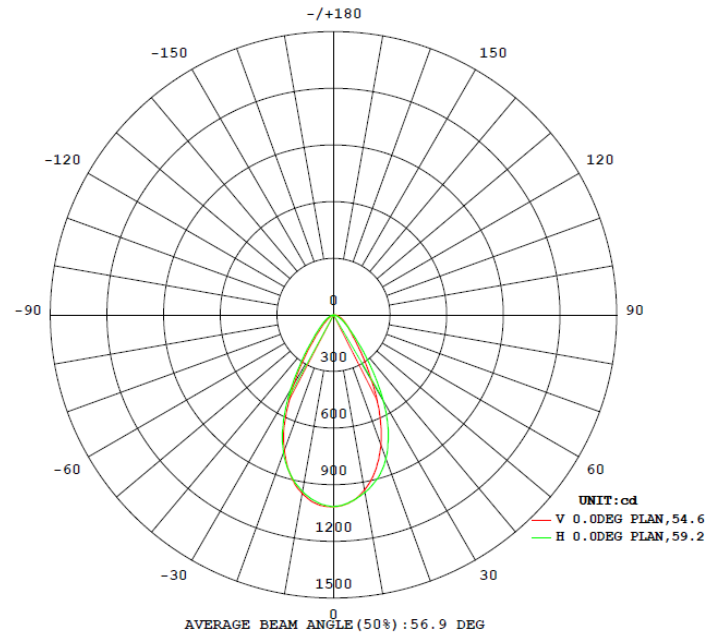
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
<b>WORST CASE</b>	120.0	60	0.066	7.7	0.971
<b>NON-WORST CASE</b>	N/A	N/A	N/A	N/A	N/A

### Test Result

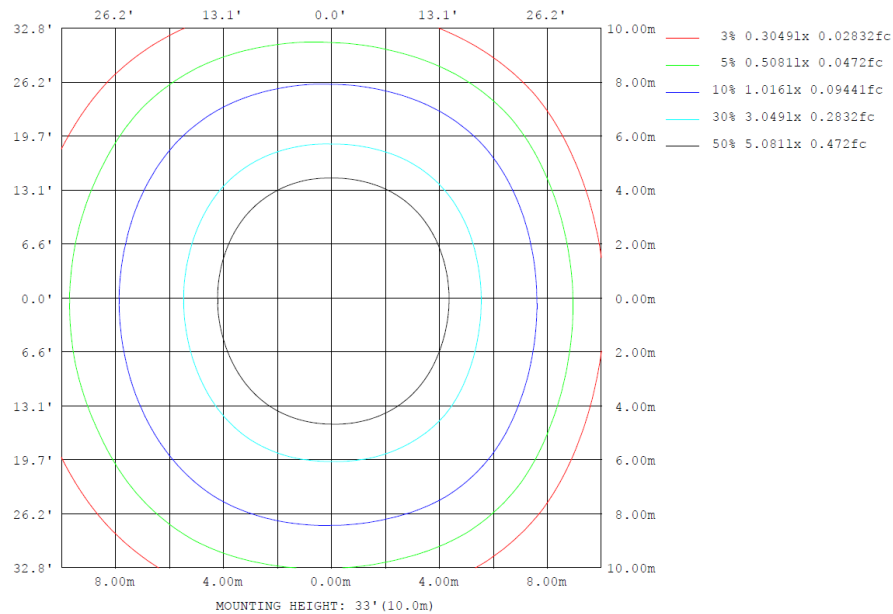
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	NEMA Type
	C0-180	C90-270	C0-180	C90-270		(0°-90°)	
1028	94.8	97.6	54.7	59.2	133.5	100.0%	5H x 5V

## 4.2 Goniophotometer Test

### Lighting Distribution Curve



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

ZONAL FLUX DIAGRAM:

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	%lum, lamp
10	960.3	960.2	954.8	945.1	942.3	954.1	950.4	964.1	0- 10	93.91	93.91	9.14, 9.14
20	765.2	802.7	811.9	773.3	734.4	764.1	777.8	787.2	10- 20	245.5	339.4	33, 33
30	420.7	520.6	529.3	491.7	408.5	465.4	454.7	475.8	20- 30	288.4	627.8	61.1, 61.1
40	148.4	219.1	230.2	224.7	180.6	202.4	180.5	183.3	30- 40	197.1	824.9	80.3, 80.3
50	57.79	82.34	98.04	111.7	100.5	102.5	82.03	70.96	40- 50	101.1	926.1	90.1, 90.1
60	18.70	28.13	48.14	62.74	61.93	57.86	41.29	25.07	50- 60	56.20	982.3	95.6, 95.6
70	1.504	5.108	19.01	32.19	35.10	29.07	15.89	4.541	60- 70	28.79	1011	98.4, 98.4
80	0.0109	0.0184	5.679	13.38	16.03	12.52	5.048	0.0126	70- 80	11.81	1023	99.5, 99.5
90	0	0	0	0	0	0	0	0	80- 90	5.017	1028	100, 100
100	0	0	0	0	0	0	0	0	90-100	0.0000	1028	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	1028	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	1028	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	1028	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	1028	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	1028	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	1028	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	1028	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	1028	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

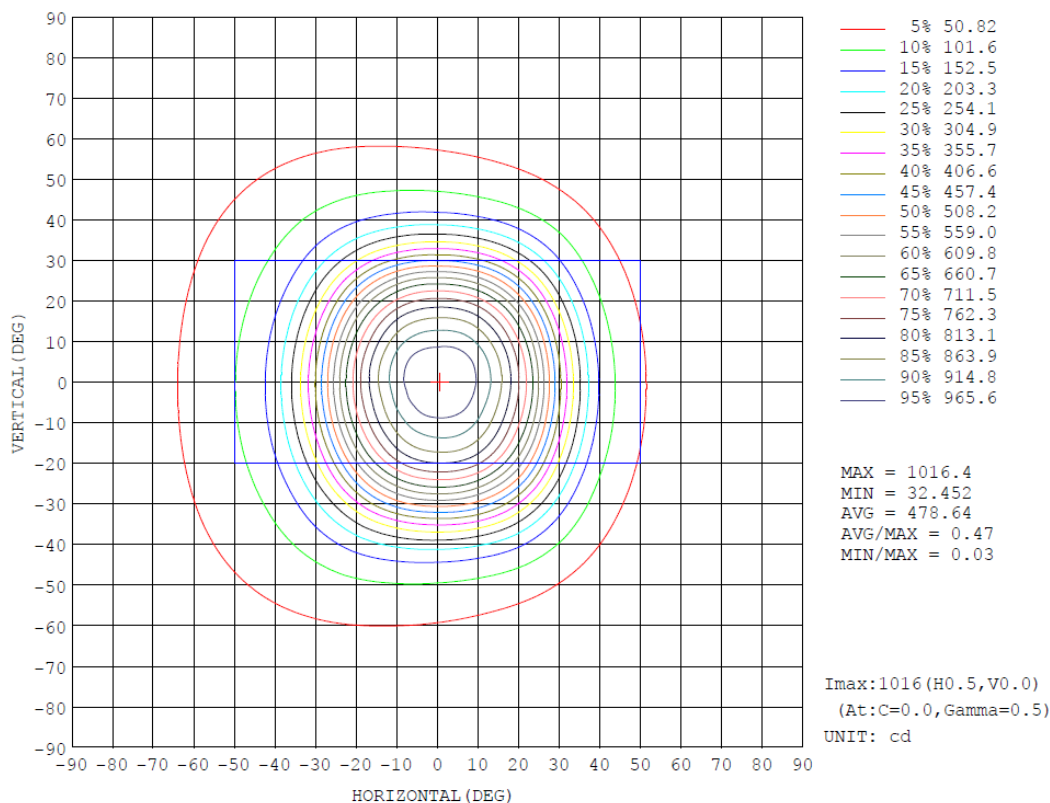
	Zonal (lm)		Total (lm)	Percent
0-10	93.94	0-10	93.94	9.09%
10-20	245.45	0-20	339.39	32.83%
20-30	288.60	0-30	627.99	60.75%
30-40	200.04	0-40	828.03	80.10%
40-50	103.35	0-50	931.38	90.10%
50-60	56.85	0-60	988.23	95.59%
60-70	29.14	0-70	1017.37	98.41%
70-80	12.09	0-80	1029.46	99.58%
80-90	4.31	0-90	1033.77	100.00%
90-100	0.00	0-100	1033.77	100.00%
100-110	0.00	0-110	1033.77	100.00%
110-120	0.00	0-120	1033.77	100.00%
120-130	0.00	0-130	1033.77	100.00%
130-140	0.00	0-140	1033.77	100.00%
140-150	0.00	0-150	1033.77	100.00%
150-160	0.00	0-160	1033.77	100.00%
160-170	0.00	0-170	1033.77	100.00%
170-180	0.00	0-180	1033.77	100.00%

## 4.2 Goniophotometer Test

### Area Flux Diagram

		AREA FLUX DIAGRAM																UNIT:lm				Φ t	Φ a
VERTICAL (DEG)	90	0.02	0.07	0.12	0.16	0.18	0.19	0.17	0.14	0.09	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	0.00		
	80	0.03	0.09	0.16	0.22	0.29	0.34	0.37	0.36	0.32	0.24	0.16	0.08	0.03	0.00	0.00	0.00	0.00	0.00	2.71	0.00		
	70	0.03	0.10	0.20	0.34	0.52	0.70	0.85	0.91	0.88	0.76	0.57	0.36	0.17	0.05	0.01	0.00	0.00	0.00	6.45	0.00		
	60	0.03	0.12	0.27	0.53	0.88	1.26	1.62	1.83	1.87	1.73	1.42	0.98	0.54	0.21	0.05	0.00	0.00	0.00	13.3	0.00		
	50	0.03	0.13	0.36	0.75	1.28	1.97	2.77	3.43	3.73	3.56	2.97	2.09	1.18	0.50	0.13	0.01	0.00	0.00	24.9	11.4		
	40	0.03	0.16	0.46	0.96	1.71	2.93	4.90	7.34	8.94	8.85	7.05	4.31	2.12	0.90	0.27	0.03	0.00	0.00	51.0	44.3		
	30	0.03	0.18	0.53	1.15	2.16	4.23	8.80	14.8	18.6	18.6	15.0	8.68	3.51	1.32	0.42	0.06	0.00	0.00	98.1	93.0		
	20	0.04	0.19	0.59	1.29	2.57	5.76	13.0	21.3	25.9	26.1	22.0	13.4	5.25	1.72	0.55	0.09	0.00	0.00	140	135		
	10	0.04	0.20	0.62	1.38	2.84	6.83	15.5	24.5	29.5	29.7	25.2	16.2	6.49	1.99	0.63	0.11	0.00	0.00	162	158		
	0	0.04	0.20	0.63	1.39	2.87	6.89	15.6	24.4	29.3	29.6	25.2	16.3	6.59	2.03	0.64	0.11	0.00	0.00	162	158		
	-10	0.04	0.19	0.60	1.32	2.64	5.95	13.3	21.7	26.4	26.7	22.5	14.0	5.55	1.80	0.57	0.09	0.00	0.00	143	139		
	-20	0.03	0.18	0.55	1.18	2.25	4.49	9.50	16.0	20.1	20.2	16.6	9.81	3.91	1.41	0.44	0.06	0.00	0.00	107	102		
	-30	0.03	0.16	0.47	1.00	1.80	3.16	5.58	8.75	10.9	10.9	8.78	5.28	2.44	0.97	0.29	0.04	0.00	0.00	60.5	54.4		
	-40	0.03	0.14	0.38	0.79	1.36	2.14	3.14	4.08	4.57	4.43	3.70	2.52	1.35	0.56	0.15	0.02	0.00	0.00	29.4	19.2		
	-50	0.03	0.12	0.29	0.57	0.95	1.38	1.81	2.10	2.18	2.03	1.67	1.15	0.61	0.24	0.05	0.00	0.00	0.00	15.2	0.00		
	-60	0.03	0.10	0.21	0.37	0.57	0.79	0.96	1.05	1.03	0.90	0.67	0.42	0.20	0.06	0.01	0.00	0.00	0.00	7.39	0.00		
	-70	0.03	0.09	0.16	0.24	0.31	0.38	0.42	0.42	0.37	0.29	0.19	0.10	0.04	0.01	0.00	0.00	0.00	0.00	3.03	0.00		
	-80	0.02	0.08	0.13	0.17	0.19	0.20	0.19	0.16	0.11	0.06	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.00		
	-90	0.02	0.08	0.13	0.17	0.19	0.20	0.19	0.16	0.11	0.06	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.00		
		-90	-80	-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90			
		Φ t	0.57	2.50	6.73	13.8	25.4	49.6	98.4	153	185	185	154	95.7	40.0	13.8	4.23	0.63	0.02	0.00	1028	---	
		Φ a	0.00	0.00	0.00	0.00	12.6	40.0	89.9	145	177	177	147	89.2	32.5	3.06	0.00	0.00	0.00	0.00	---	914	

### Isocandela



## 4.2 Goniophotometer Test

## Luminous Distribution Intensity Data

UNIT: cd																			
H (DEG)	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
V (DEG)	-180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-80	0.00	10.7	11.1	11.4	11.5	11.5	11.4	11.4	11.3	11.1	10.9	10.5	10.1	9.58	8.94	8.22	7.42	6.57	5.68
-70	0.00	11.2	11.9	12.4	13.0	13.8	14.9	16.4	17.8	19.3	20.8	21.9	22.8	23.2	23.2	22.9	22.0	20.7	19.0
-60	0.00	11.6	12.5	13.7	15.6	18.5	22.3	26.2	30.5	34.7	38.9	42.7	46.1	48.8	50.5	51.2	51.1	50.1	48.1
-50	0.00	11.9	13.2	15.5	19.6	25.3	31.7	38.7	45.9	53.3	61.0	69.1	77.4	85.3	92.0	96.5	99.1	99.6	98.0
-40	0.00	12.1	14.0	17.9	24.4	32.4	41.5	50.9	61.1	72.6	86.4	103	124	149	175	197	215	228	230
-30	0.00	12.3	14.7	20.2	28.7	39.0	50.0	61.9	75.7	92.6	115	148	196	263	343	421	483	519	529
-20	0.00	12.4	15.4	22.4	32.2	44.0	56.5	70.9	88.5	112	146	203	295	417	551	665	747	795	812
-10	0.00	12.5	15.9	23.4	34.4	47.1	60.7	76.7	97.6	126	172	256	378	536	687	802	888	938	955
0	0.00	12.6	16.0	24.1	35.1	48.0	61.9	78.6	101	130	181	273	408	577	734	854	942	997	1016
10	0.00	12.5	15.8	23.5	34.2	46.7	60.1	75.8	96.1	124	168	250	371	529	682	800	890	938	950
20	0.00	12.4	15.3	22.1	31.7	43.3	55.5	69.3	86.0	108	140	193	280	398	529	639	718	764	778
30	0.00	12.3	14.6	19.9	28.1	37.9	48.6	60.0	72.9	88.7	109	138	179	236	301	367	418	449	455
40	0.00	12.1	13.9	17.5	23.7	31.2	39.9	48.8	58.3	68.9	81.0	95.6	112	130	148	163	174	181	180
50	0.00	11.8	13.1	15.2	19.0	24.2	30.0	36.5	43.1	49.8	56.7	63.6	70.2	76.1	80.6	83.3	84.5	84.3	82.0
60	0.00	11.5	12.4	13.5	15.2	17.7	20.9	24.4	28.0	31.7	35.4	38.5	41.2	43.3	44.4	44.8	44.4	43.3	41.3
70	0.00	11.2	11.8	12.2	12.8	13.5	14.3	15.3	16.4	17.5	18.5	19.4	19.9	20.1	19.9	19.4	18.6	17.4	15.9
80	0.00	10.6	11.0	11.2	11.2	11.2	11.2	11.0	10.9	10.6	10.3	9.91	9.43	8.85	8.18	7.45	6.69	5.89	5.05
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table--2																	UNIT: cd		
H (DEG)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
V (DEG)																			
-180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-80	4.79	3.90	3.00	2.04	1.10	0.33	0.04	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	
-70	16.9	14.6	12.0	9.45	7.01	4.89	3.30	2.15	1.21	0.34	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	
-60	45.2	41.3	36.5	31.0	25.4	19.8	14.3	9.51	5.23	2.68	1.35	0.31	0.00	0.00	0.01	0.01	0.01	0.00	
-50	94.7	89.0	81.7	72.6	61.6	49.1	36.4	25.6	17.1	9.89	4.27	1.69	0.49	0.01	0.01	0.01	0.01	0.00	
-40	224	210	189	162	129	99.1	71.8	50.9	34.0	21.5	11.6	4.36	1.43	0.15	0.01	0.01	0.01	0.00	
-30	522	490	433	354	264	182	120	79.4	53.8	34.5	20.2	9.46	2.76	0.73	0.01	0.01	0.01	0.00	
-20	805	767	690	580	441	296	182	112	71.7	46.9	27.9	14.2	4.58	1.13	0.00	0.01	0.01	0.00	
-10	947	908	830	718	563	388	239	139	85.3	55.2	33.5	17.6	6.26	1.40	0.03	0.01	0.01	0.00	
0	1006	960	881	765	607	421	259	148	90.8	57.8	35.2	18.7	6.84	1.50	0.04	0.01	0.01	0.00	
10	946	906	828	712	552	378	231	134	83.0	54.2	32.8	17.3	6.13	1.38	0.02	0.01	0.01	0.00	
20	768	731	655	543	406	272	167	104	68.3	45.1	26.9	13.7	4.49	1.09	0.01	0.01	0.01	0.00	
30	446	416	365	295	220	154	106	72.7	50.4	32.5	19.1	8.90	2.64	0.67	0.01	0.01	0.01	0.00	
40	176	164	148	127	105	82.8	63.0	45.8	31.0	19.8	10.7	4.16	1.32	0.10	0.01	0.01	0.01	0.00	
50	79.0	74.3	68.4	61.1	52.3	42.3	31.8	23.0	15.3	8.81	3.99	1.54	0.38	0.01	0.01	0.01	0.01	0.00	
60	38.6	35.2	31.1	26.5	21.8	17.0	12.5	8.19	4.65	2.36	1.19	0.18	0.00	0.00	0.01	0.01	0.01	0.00	
70	14.1	12.2	10.1	7.98	5.96	4.22	2.87	1.87	0.93	0.17	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02	
80	4.25	3.40	2.52	1.56	0.68	0.09	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.00	
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

<b>Model No.</b>	LF34SW @3500K	<b>Sample ID</b>	240812012-S1
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

<b>Test Method</b>
<p>The samples were tested according to the and Ansi C82.77: 2002 and ANSI C82.77-10:2020</p> <p>The total harmonic distortion shall be measured to the 40th order.</p> <p>The ambient temperature shall be maintained at <math>25 \pm 1^\circ\text{C}</math>. 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	0.066	7.7	0.971	13.50

## 5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2023-11-08	2024-11-07
NTC-F01-006	2.0 meter Integrating Sphere	2023-11-08	2024-11-07
NTC-F01-012	Standard Lamp	2023-11-02	2024-11-01
NTC-F01-013	Standard Lamp	2023-11-02	2024-11-01
NTC-F01-031	Digital Power Meter	2023-08-25	2024-08-24
NTC-F01-019	Temperature & Humidity Meter	2023-11-06	2024-11-05

\*\*\*\*\*End of Report\*\*\*\*\*