



# Photometric Test Report

## Relevant Standards

- ☒ IES LM-79-2019
- ☒ ANSI C82.77-10:2014

## Prepared For

**RAB Lighting Inc.**

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## Project Number

**DLF2509110**

## Report Number

**DLF2509110-32a**

## Test Date

**2025/9/24**

## Issue Date

**2025/9/27**

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Kevin Jia

The results contained in this report pertain only to the tested sample.

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## 1.0 Test Summary

DLC Technical Requirements v5.1

Indoor - Linear Ambient - Linear Ambient Luminaires (Indirect Component)				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2019	1000		2744
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2019	≥500		1372
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2019	Standard 115	Premium 130	134.5
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2019	Wroست Case		20.4
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77-10: 2014	20.00%	120V	2.84%
		20.00%	277V	6.79%
Power Factor (THD & PF - section 4.3)	ANSI C82.77-10: 2014	0.9	120V	0.996
		0.9	277V	0.926
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2019	7 step	3985±275	3957
		4 step	3985±154	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2019 CIE 13.3-1995	≥80		93
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2019 CIE 13.3-1995	≥0		68
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		91
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89		100
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%≤IES Rcs,h1≤+23%		-5%
Zonal Lumen Requirement (90°-150°) (Goniophotometer - Section 4.2)	IES LM-79-2019	≥35%		33.38%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22		24.5
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2019	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2019	Worst Case		0.080
(Goniophotometer - Section 4.2)		Non-Worst Case		0.169
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2019	Worst Case		20.4
(Goniophotometer - Section 4.2)		Non-Worst Case		20.2

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Build Level	Sample No.
1	Integrating Sphere Test	2025/9/24	BOAE2PU @ 20W/4000K/50%/50%	N/A	DLF2509110-AF1
2	Goniophotometer Test	2025/9/24	BOAE2PU @ 20W/4000K/50%/50%	N/A	DLF2509110-AF1
3	THD and PF Test	2025/9/24	BOAE2PU @ 20W/4000K/50%/50%	N/A	DLF2509110-AF1

### Remark(If any)

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2. The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

## 3.0 DUT Description

**Model Number:** BOAE2PU @ 20W/4000K/50%/50%

**Electrical Rating:** 120V-277V, 50/60HZ

**Received Date:** 2025/9/22

### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

Model No.	BOAE2PU @ 20W/4000K/50%/50%	Sample ID.	DLF2509110-AF1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.2	Humidity (%RH)	55.2

#### Test Method

The samples were tested according to the IES LM-79-2019.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature and relative humidity condition inside the sphere was maintained at 25° C ± 1.2° C and 10% - 65% RH.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

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.

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 780 nm.

#### Test Result

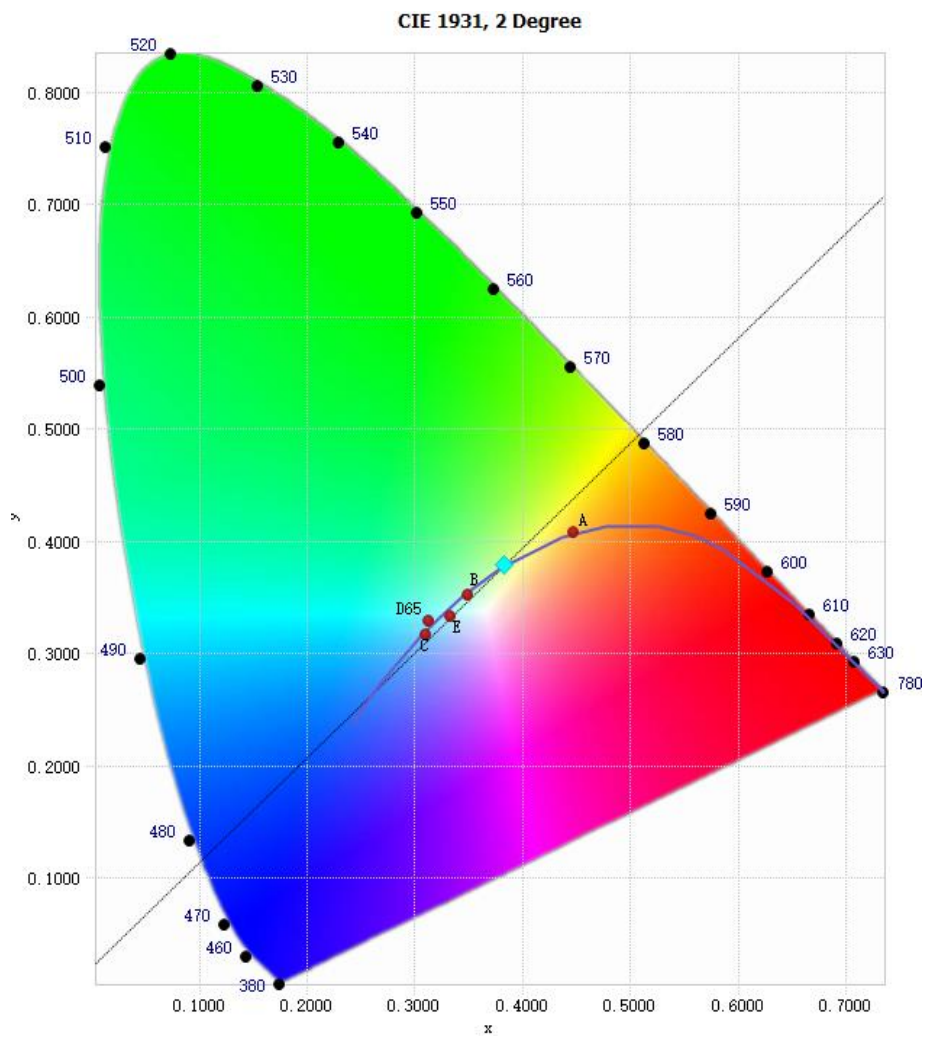
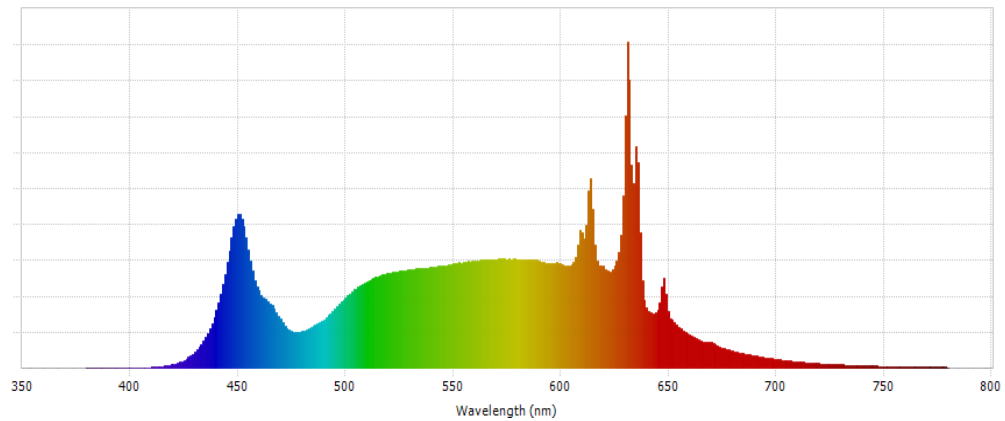
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.99	60	0.169	20.2	0.996
277.01	60	0.080	20.4	0.926

#### Test Result

CCT (K)	CRI	R9	Duv
3957	93	68	0.0006

Rf	Rg	IES Rcs,h1
91	100	-5%

## 4.1 Integrating Sphere Test



## 4.1 Integrating Sphere Test

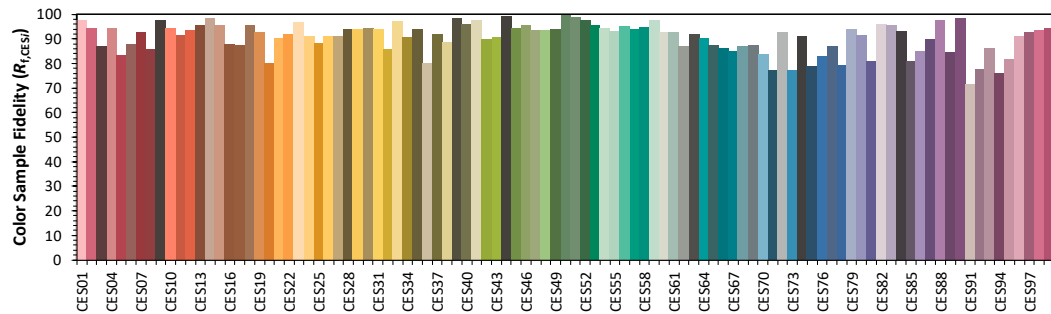
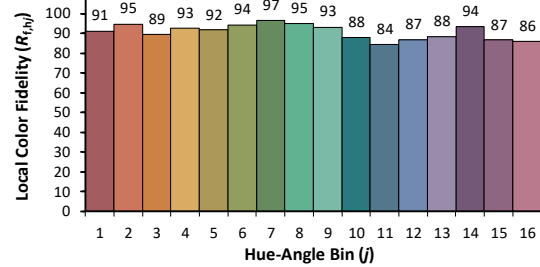
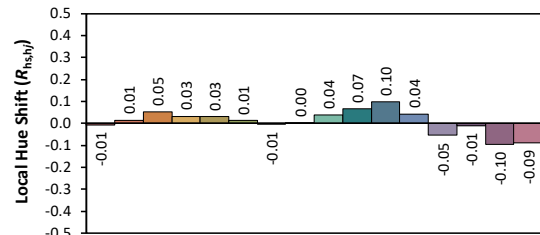
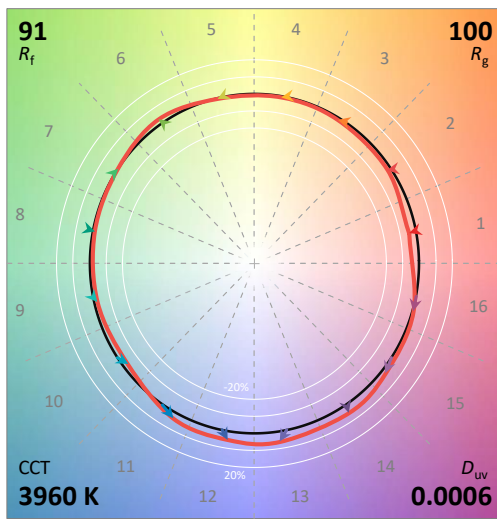
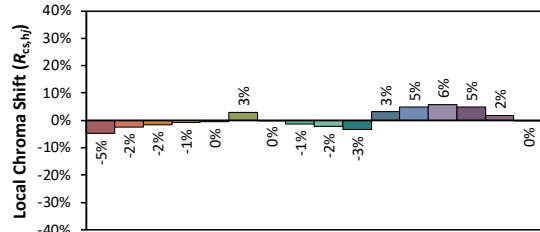
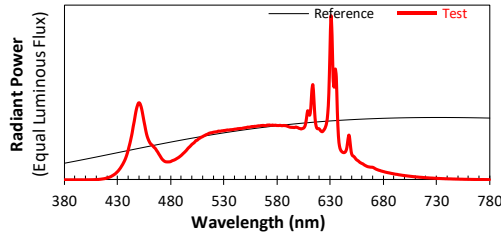
### IES TM-30-18 Color Rendition Report

Source: DLF2509110-32a

Manufacturer: RAB Lighting Inc.

Date: 2025/9/24

Model: BOAE2PU @ 20W/4000K/50%/50%



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

$x$  0.3827  
 $y$  0.3794  
 $u'$  0.2255  
 $v'$  0.5031

CIE 13.3-1995  
(CRI)

$R_a$  94  
 $R_g$  71



#### 4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength							
WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)
380	7.07E-05	485	1.56E-02	590	4.04E-02	695	3.88E-03
385	7.15E-05	490	1.83E-02	595	3.95E-02	700	3.31E-03
390	7.70E-05	495	2.23E-02	600	3.93E-02	705	2.80E-03
395	7.85E-05	500	2.66E-02	605	3.90E-02	710	2.37E-03
400	9.47E-05	505	2.98E-02	610	5.11E-02	715	2.00E-03
405	1.34E-04	510	3.25E-02	615	5.99E-02	720	1.70E-03
410	2.72E-04	515	3.45E-02	620	3.84E-02	725	1.42E-03
415	6.13E-04	520	3.58E-02	625	3.84E-02	730	1.23E-03
420	1.41E-03	525	3.67E-02	630	9.52E-02	735	1.03E-03
425	3.02E-03	530	3.71E-02	635	8.35E-02	740	8.79E-04
430	6.07E-03	535	3.75E-02	640	2.27E-02	745	7.40E-04
435	1.16E-02	540	3.81E-02	645	2.18E-02	750	6.29E-04
440	2.16E-02	545	3.87E-02	650	2.13E-02	755	5.32E-04
445	4.02E-02	550	3.93E-02	655	1.52E-02	760	4.23E-04
450	5.79E-02	555	3.99E-02	660	1.24E-02	765	3.79E-04
455	4.47E-02	560	4.03E-02	665	1.02E-02	770	3.47E-04
460	2.90E-02	565	4.09E-02	670	9.54E-03	775	2.71E-04
465	2.43E-02	570	4.09E-02	675	7.62E-03	780	2.00E-04
470	1.84E-02	575	4.11E-02	680	6.36E-03		
475	1.38E-02	580	4.10E-02	685	5.40E-03		
480	1.38E-02	585	4.08E-02	690	4.57E-03		

## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

Model No.	BOAE2PU @ 20W/4000K/50%/50%	Sample ID.	DLF2509110-AF1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.1	Humidity (%RH)	55.0

#### Test Method

The samples were tested according to the IES LM-79-2019.

Photometric paramters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at 25° C ± 1.2° C and 10% - 65% RH, measured at a point not more than 1 m from the sample and at the same height as the sample.

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.

Airflow for the instantaneous tangential velocity of any point on the DUT shall be less than an upper tolerance limit of 0.20 m/s.

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 0.5° vertical intervals and 10° horizontal intervals.

#### Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.02	60	0.080	20.4	0.926
NON-WORST CASE	120.10	60	0.169	20.2	0.996

#### Test Result

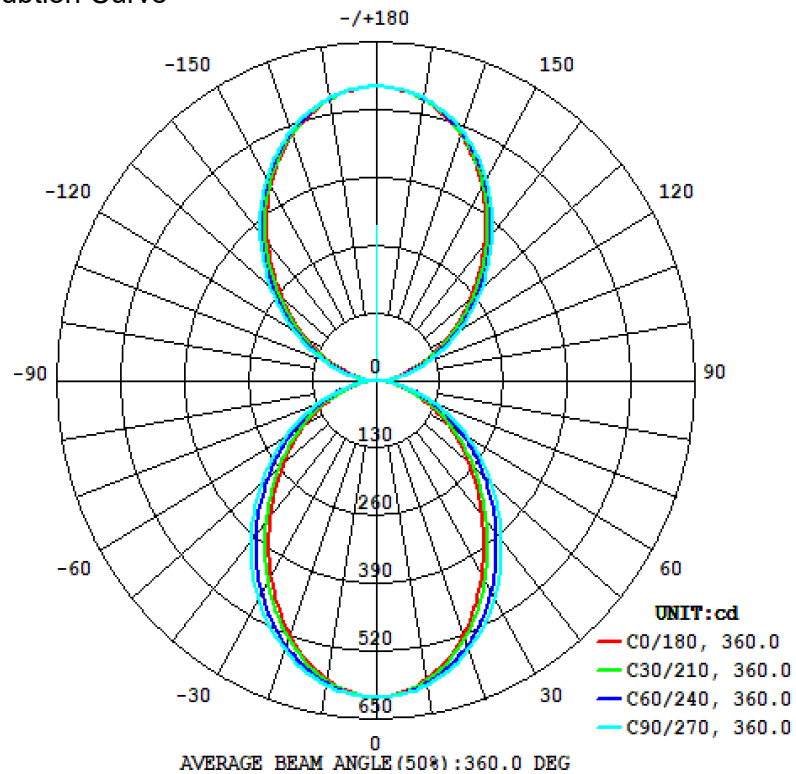
Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
2744	360.0	360.0	360.0	360.0	134.5

Zonal Lumen Requirement (90°-150°)	UGR (X=4H, Y=8H, 70/50/20%)	Length(ft)	Lumen/ft
33.38%	24.5	2	1372

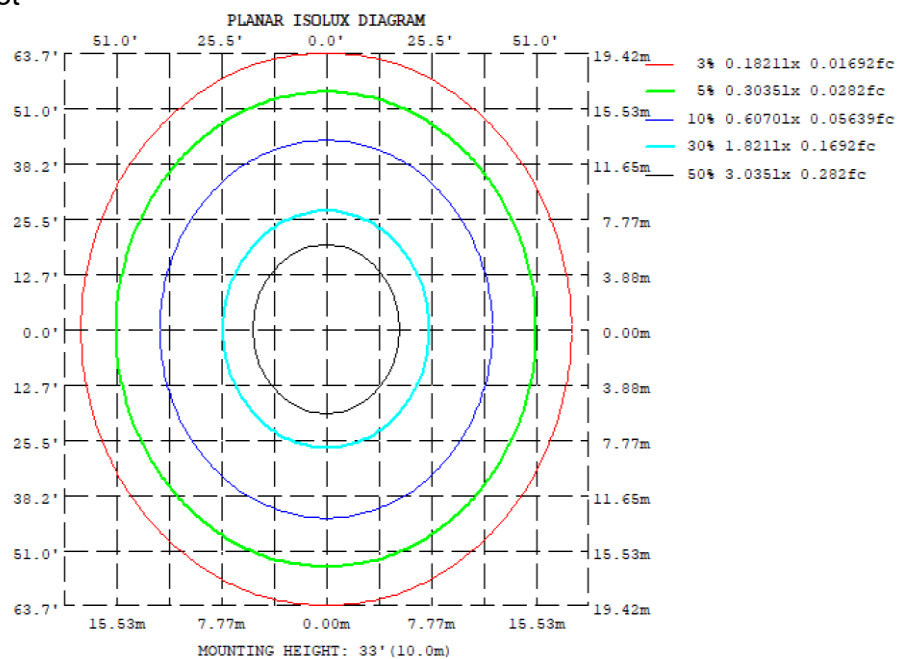


## 4.2 Goniophotometer Test

### Light Distrubtion Curve



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	583.2	587.7	592.5	587.7	583.2	587.7	592.5	587.7
20	519.7	533.8	549.6	533.8	519.7	533.8	549.6	533.8
30	431.4	455.8	482.7	455.8	431.4	455.8	482.7	455.8
40	336.8	365.1	398.7	365.1	336.8	365.1	398.7	365.1
50	249.4	274.3	307.1	274.3	249.4	274.3	307.1	274.3
60	170.2	189.3	213.4	189.3	170.2	189.3	213.4	189.3
70	98.58	110.1	124.1	110.1	98.58	110.1	124.1	110.1
80	37.09	40.54	43.88	40.54	37.09	40.54	43.88	40.54
90	0	0	0	0	0	0	0	0
100	30.00	35.18	38.52	35.18	30.00	35.18	38.52	35.18
110	91.91	102.0	111.9	102.0	91.91	102.0	111.9	102.0
120	167.6	181.2	194.8	181.2	167.6	181.2	194.8	181.2
130	253.4	268.0	282.0	268.0	253.4	268.0	282.0	268.0
140	345.5	357.7	369.1	357.7	345.5	357.7	369.1	357.7
150	433.3	441.2	448.5	441.2	433.3	441.2	448.5	441.2
160	504.7	508.3	511.9	508.3	504.7	508.3	511.9	508.3
170	550.6	551.5	552.4	551.5	550.6	551.5	552.4	551.5
180	566.3	566.3	566.3	566.3	566.3	566.3	566.3	566.3
DEG	LUMINOUS INTENSITY:cd							

### UGR Table - Corrected

UGR Table - Corrected											
Reflectances											
Ceiling Cavity											
Walls											
Floor Cavity											
Room Size											
X=2H Y=2H											
3H											
4H											
6H											
8H											
12H											
4H 2H											
3H											
4H											
6H											
8H											
12H											
8H 4H											
6H											
8H											
12H											
12H 4H											
6H											
8H											
Maximum UGR = 27.7											

## 4.2 Goniophotometer Test

### ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	57.02	0 - 10	57.02	2.08%
10-20	158.90	0 - 20	215.92	7.87%
20-30	228.85	0 - 30	444.77	16.21%
30-40	257.56	0 - 40	702.33	25.59%
40-50	247.63	0 - 50	949.96	34.62%
50-60	208.28	0 - 60	1158.24	42.21%
60-70	148.91	0 - 70	1307.15	47.63%
70-80	79.19	0 - 80	1386.34	50.52%
80-90	18.67	0 - 90	1405.01	51.20%
90-100	14.62	0 - 100	1419.63	51.73%
100-110	70.54	0 - 110	1490.17	54.30%
110-120	139.19	0 - 120	1629.36	59.37%
120-130	200.13	0 - 130	1829.49	66.67%
130-140	241.21	0 - 140	2070.70	75.46%
140-150	250.37	0 - 150	2321.07	84.58%
150-160	219.57	0 - 160	2540.64	92.58%
160-170	150.20	0 - 170	2690.84	98.06%
170-180	53.35	0 - 180	2744.19	100.00%

## 4.2 Goniophotometer Test

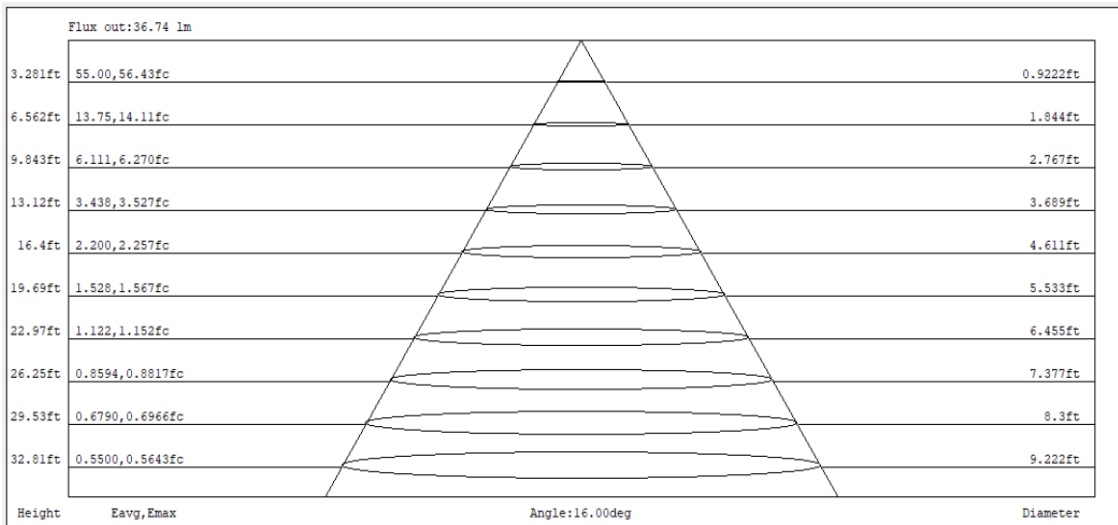
### COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

#### Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	107	107	107	107	99	99	99	99	84	84	84	70	70	70	57	57	57	51
1	98	94	90	87	91	87	84	81	74	72	70	62	60	59	51	50	49	44
2	90	82	76	71	83	76	71	67	65	61	58	55	52	49	45	43	41	37
3	82	73	65	60	75	67	61	56	58	53	49	49	45	42	40	38	36	31
4	75	64	57	51	69	60	53	48	51	46	42	43	39	36	36	33	31	27
5	69	58	49	44	64	54	46	41	46	41	36	39	35	32	33	29	27	24
6	64	52	44	38	59	48	41	36	42	36	32	35	31	28	30	26	24	21
7	59	47	39	33	54	44	37	32	38	32	28	32	28	25	27	24	21	19
8	55	42	35	30	51	40	33	28	34	29	25	30	25	22	25	22	19	17
9	51	39	31	26	47	36	30	25	32	26	22	27	23	20	23	20	17	15
10	48	36	29	24	44	33	27	23	29	24	20	25	21	18	21	18	16	14

### CONE OF LIGHT DIAGRAM



## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

Model No.	BOAE2PU @ 20W/4000K/50%/50%	Sample ID.	DLF2509110-AF1
Temperature (°C)	25.2	Humidity (%RH)	55.2

#### Test Method

The samples were tested according to the ANSI C82.77-10:2014.

The ambient temperature shall be maintained at 25° C ± 1.0° C and 10% - 65% RH. 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 were calculated.

#### Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
119.99	60	0.169	20.2	0.996	2.84%
277.01	60	0.080	20.4	0.926	6.79%

## 5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2024/12/23	2025/12/22
DLF108	Auxiliary Lamp	2024/12/23	2025/12/22
DLF122	Measurement Standard Lamp Standard Lamp Type: Tungsten, Omni-directional	2024/12/23	2025/12/22
DLF116	AC Power Source	2024/12/13	2025/12/12
DLF516	Power Meter	2024/12/13	2025/12/12
DLF112	Temperature Recorder	2024/12/19	2025/12/18
DLF114	Temperature & Humidity Datalogger	2024/12/19	2025/12/18
DLF521	Measurement Standard Lamp Standard Lamp Type: Tungsten, Omni-directional	2024/12/23	2025/12/22
DLF101	Goniophotometer	2024/12/23	2025/12/22
DLF511	AC Power Source	2024/12/13	2025/12/12
DLF512	AC Power Source	2024/12/13	2025/12/12
DLF513	AC Power Source	2024/12/13	2025/12/12
DLF507	DC Power Source	2024/12/13	2025/12/12
DLF111	Temperature & Humidity Datalogger	2024/12/19	2025/12/18
DLF119	Power Meter	2024/12/13	2025/12/12
DLF530	Hot-wire anemometer	2025/1/23	2026/1/22
DLF129	Clock	2025/9/4	2026/9/3

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