

Photometric Test Report

Relevant Standards

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

Prepared For

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Project Number

DLF2509110

Report Number

DLF2509110-31a

Test Date

2025/9/24

Issue Date

2025/9/27

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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		2783
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2019	≥500		1392
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2019	Standard 115	Premium 130	140.6
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2019	Wrosted Case		19.8
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77-10: 2014	20.00%	120V	3.00%
		20.00%	277V	7.07%
Power Factor (THD & PF - section 4.3)	ANSI C82.77-10: 2014	0.9	120V	0.995
		0.9	277V	0.923
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2019	7 step	3465±245	3413
		4 step	3465±124	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2019 CIE 13.3-1995	≥80		94
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2019 CIE 13.3-1995	≥0		67
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		101
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%		34.13%
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		0.077
(Goniophotometer - Section 4.2)		Non-Worst Case		0.164
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2019	Worst Case		19.8
(Goniophotometer - Section 4.2)		Non-Worst Case		19.6

2.0 Test List

Test Item	Test	Test Date	Model Number	Build Level	Sample No.
1	Integrating Sphere Test	2025/9/24	BOAE2PU @ 20W/3500K/50%/50%	N/A	DLF2509110-AE1
2	Goniophotometer Test	2025/9/24	BOAE2PU @ 20W/3500K/50%/50%	N/A	DLF2509110-AE1
3	THD and PF Test	2025/9/24	BOAE2PU @ 20W/3500K/50%/50%	N/A	DLF2509110-AE1

Remark(If any)

1. This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.
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/3500K/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/3500K/50%/50%	Sample ID.	DLF2509110-AE1
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

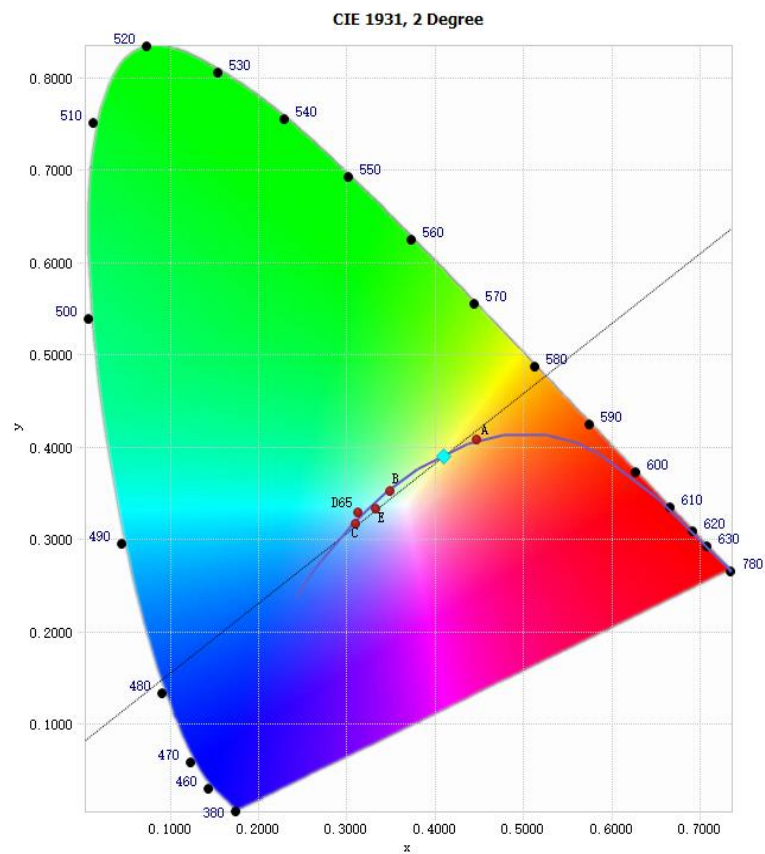
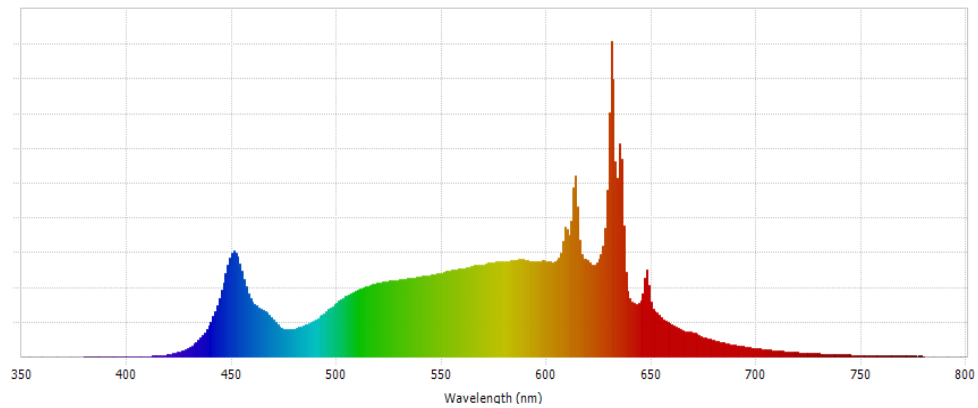
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.02	60	0.164	19.6	0.995
277.01	60	0.077	19.8	0.923

Test Result

CCT (K)	CRI	R9	Duv
3413	94	67	-0.0009

Rf	Rg	IES Rcs,h1
91	101	-5%

4.1 Integrating Sphere Test



4.1 Integrating Sphere Test

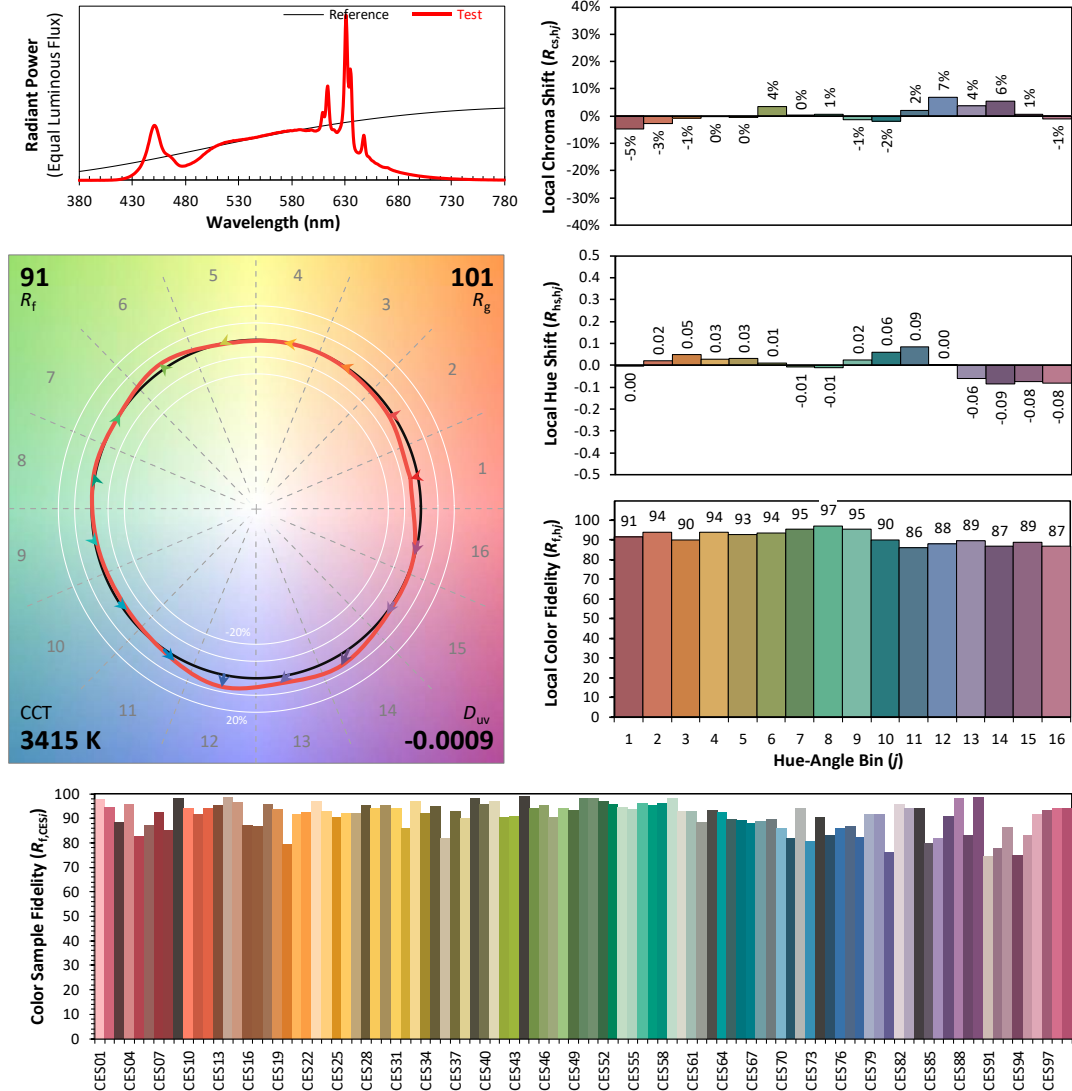
IES TM-30-18 Color Rendition Report

Source: DLF2509110-31a

Manufacturer: RAB Lighting Inc.

Date: 2025/9/24

Model: BOAE2PU @ 20W/3500K/50%/50%



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

x 0.4092
 y 0.3907
 u' 0.2383
 v' 0.5118

CIE 13.3-1995
(CRI)

R_a 95
 R_g 70

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	6.42E-05	485	1.42E-02	590	4.33E-02	695	4.45E-03
385	5.49E-05	490	1.68E-02	595	4.30E-02	700	3.77E-03
390	8.40E-05	495	2.03E-02	600	4.30E-02	705	3.17E-03
395	7.19E-05	500	2.42E-02	605	4.33E-02	710	2.66E-03
400	6.30E-05	505	2.73E-02	610	5.73E-02	715	2.26E-03
405	1.21E-04	510	2.99E-02	615	6.77E-02	720	1.93E-03
410	1.93E-04	515	3.18E-02	620	4.35E-02	725	1.61E-03
415	4.46E-04	520	3.31E-02	625	4.38E-02	730	1.36E-03
420	1.03E-03	525	3.42E-02	630	1.10E-01	735	1.16E-03
425	2.23E-03	530	3.47E-02	635	9.60E-02	740	9.94E-04
430	4.42E-03	535	3.52E-02	640	2.60E-02	745	8.35E-04
435	8.39E-03	540	3.61E-02	645	2.51E-02	750	6.92E-04
440	1.58E-02	545	3.68E-02	650	2.44E-02	755	5.85E-04
445	2.99E-02	550	3.77E-02	655	1.74E-02	760	4.95E-04
450	4.66E-02	555	3.88E-02	660	1.43E-02	765	3.97E-04
455	3.83E-02	560	3.97E-02	665	1.17E-02	770	3.28E-04
460	2.47E-02	565	4.07E-02	670	1.09E-02	775	2.85E-04
465	2.11E-02	570	4.15E-02	675	8.72E-03	780	2.61E-04
470	1.66E-02	575	4.22E-02	680	7.32E-03		
475	1.25E-02	580	4.27E-02	685	6.19E-03		
480	1.25E-02	585	4.33E-02	690	5.23E-03		

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	BOAE2PU @ 20W/3500K/50%/50%	Sample ID.	DLF2509110-AE1
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 $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ 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	277.00	60	0.077	19.8	0.923
NON-WORST CASE	120.03	60	0.164	19.6	0.995

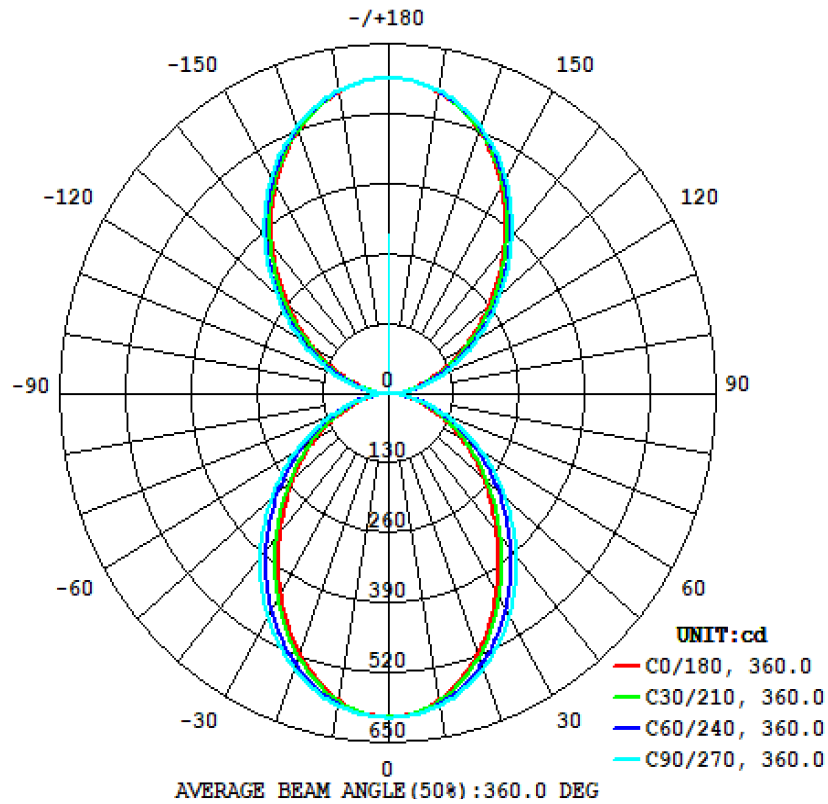
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
2783	360.0	360.0	360.0	360.0	140.6

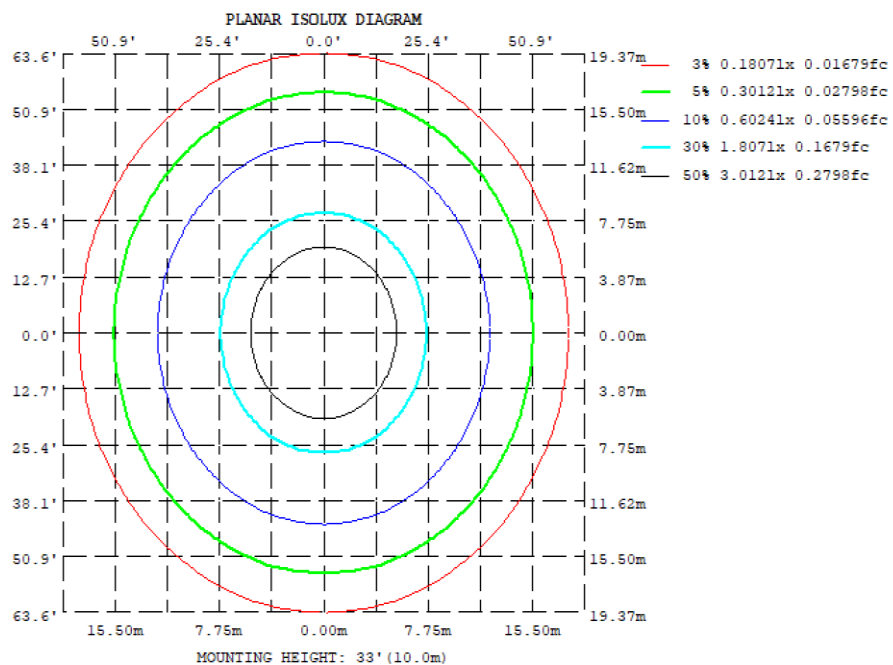
Zonal Lumen Requirement (90° - 150°)	UGR (X=4H, Y=8H, 70/50/20%)	Length(ft)	Lumen/ft
34.13%	24.5	2	1392

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	578.9	583.7	588.4	583.7	578.9	583.7	588.4	583.7
20	515.6	530.1	545.9	530.1	515.6	530.1	545.9	530.1
30	428.0	452.3	479.3	452.3	428.0	452.3	479.3	452.3
40	333.9	362.4	395.9	362.4	333.9	362.4	395.9	362.4
50	247.1	272.0	304.7	272.0	247.1	272.0	304.7	272.0
60	168.7	187.7	211.9	187.7	168.7	187.7	211.9	187.7
70	97.68	109.2	123.1	109.2	97.68	109.2	123.1	109.2
80	36.70	40.24	43.55	40.24	36.70	40.24	43.55	40.24
90	0	0	0	0	0	0	0	0
100	31.10	36.44	39.93	36.44	31.10	36.44	39.93	36.44
110	95.23	105.6	116.0	105.6	95.23	105.6	116.0	105.6
120	173.8	187.9	201.8	187.9	173.8	187.9	201.8	187.9
130	262.9	277.9	292.2	277.9	262.9	277.9	292.2	277.9
140	358.5	371.1	382.8	371.1	358.5	371.1	382.8	371.1
150	449.7	457.9	465.4	457.9	449.7	457.9	465.4	457.9
160	523.8	527.8	531.4	527.8	523.8	527.8	531.4	527.8
170	571.6	572.6	573.4	572.6	571.6	572.6	573.4	572.6
180	587.9	587.9	587.9	587.9	587.9	587.9	587.9	587.9
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected												
Reflectances												
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30	
Walls		50	30	50	30	30	50	30	50	30	30	
Floor Cavity		20	20	20	20	20	20	20	20	20	20	
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise					
X=2H	Y=2H	21.0	21.9	22.0	22.8	24.1	19.7	20.6	20.7	21.6	22.8	
	3H	22.6	23.4	23.6	24.4	25.7	21.3	22.0	22.2	23.0	24.3	
	4H	23.2	23.9	24.2	24.9	26.2	21.8	22.5	22.7	23.5	24.8	
	6H	23.5	24.2	24.5	25.2	26.5	22.1	22.8	23.1	23.8	25.1	
	8H	23.6	24.2	24.6	25.2	26.5	22.2	22.8	23.2	23.8	25.1	
	12H	23.6	24.2	24.6	25.2	26.5	22.2	22.8	23.2	23.8	25.1	
4H	2H	21.4	22.1	22.4	23.1	24.4	20.4	21.1	21.3	22.1	23.4	
	3H	23.2	23.8	24.2	24.8	26.1	22.1	22.7	23.1	23.7	25.0	
	4H	23.9	24.4	24.9	25.4	26.8	22.7	23.2	23.7	24.2	25.6	
	6H	24.3	24.8	25.4	25.9	27.2	23.1	23.6	24.1	24.6	25.9	
	8H	24.5	24.9	25.5	25.9	27.3	23.2	23.7	24.2	24.7	26.0	
	12H	24.5	24.9	25.5	25.9	27.3	23.3	23.7	24.3	24.7	26.1	
8H	4H	24.0	24.5	25.0	25.5	26.8	22.9	23.4	24.0	24.4	25.8	
	6H	24.6	25.0	25.6	26.0	27.4	23.5	23.8	24.5	24.9	26.3	
	8H	24.8	25.1	25.8	26.1	27.5	23.6	24.0	24.7	25.0	26.4	
	12H	24.9	25.1	25.9	26.2	27.6	23.7	24.0	24.8	25.1	26.5	
12H	4H	24.0	24.4	25.0	25.4	26.8	22.9	23.3	24.0	24.4	25.7	
	6H	24.6	24.9	25.6	26.0	27.3	23.5	23.8	24.6	24.9	26.3	
	8H	24.8	25.1	25.8	26.1	27.5	23.7	24.0	24.8	25.0	26.4	
Maximum UGR = 27.6												

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	56.63	0 - 10	56.63	2.03%
10-20	157.79	0 - 20	214.42	7.70%
20-30	227.19	0 - 30	441.61	15.87%
30-40	255.62	0 - 40	697.23	25.05%
40-50	245.66	0 - 50	942.89	33.88%
50-60	206.56	0 - 60	1149.45	41.30%
60-70	147.68	0 - 70	1297.13	46.61%
70-80	78.56	0 - 80	1375.69	49.43%
80-90	18.47	0 - 90	1394.16	50.09%
90-100	15.11	0 - 100	1409.27	50.64%
100-110	73.08	0 - 110	1482.35	53.26%
110-120	144.27	0 - 120	1626.62	58.44%
120-130	207.47	0 - 130	1834.09	65.90%
130-140	250.16	0 - 140	2084.25	74.89%
140-150	259.75	0 - 150	2344.00	84.22%
150-160	227.89	0 - 160	2571.89	92.41%
160-170	155.91	0 - 170	2727.80	98.01%
170-180	55.38	0 - 180	2783.18	100.00%

4.2 Goniophotometer Test

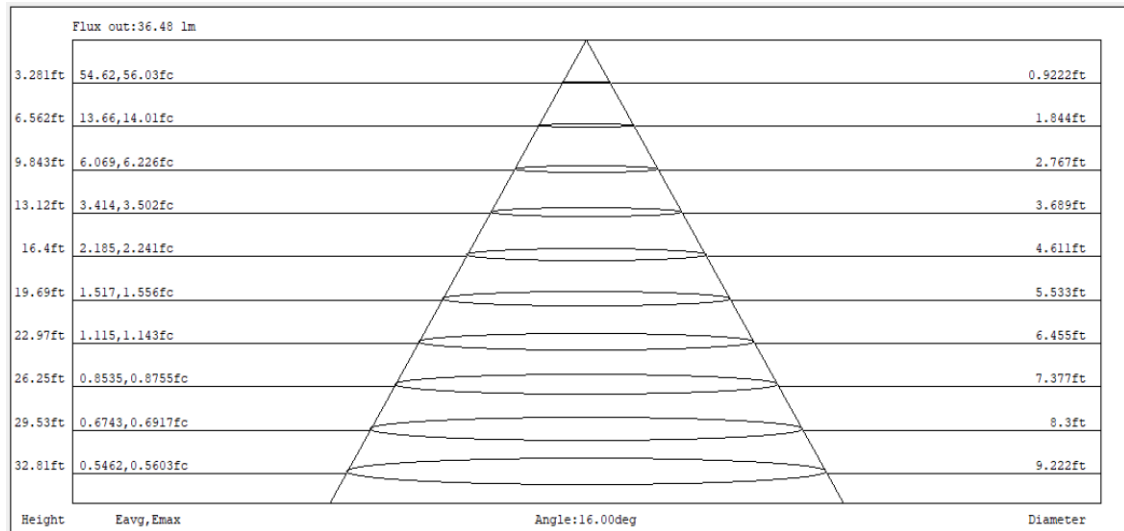
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	83	83	83	69	69	69	56	56	56	50
1	98	94	90	87	90	87	83	81	73	71	69	61	60	58	50	49	48	43
2	89	82	76	71	82	76	71	66	65	61	57	54	51	49	44	42	41	36
3	82	72	65	59	75	67	61	56	57	52	49	48	45	42	39	37	35	31
4	75	64	56	50	69	60	53	47	51	46	42	43	39	36	35	33	30	27
5	69	57	49	43	63	53	46	41	46	40	36	39	34	31	32	29	26	23
6	63	52	44	38	58	48	41	36	41	36	31	35	31	27	29	26	23	21
7	59	47	39	33	54	43	36	31	37	32	28	32	28	24	27	23	21	18
8	55	42	35	29	50	40	33	28	34	29	25	29	25	22	24	21	19	16
9	51	39	31	26	47	36	29	25	31	26	22	27	23	20	23	19	17	15
10	48	36	28	24	44	33	27	22	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/3500K/50%/50%	Sample ID.	DLF2509110-AE1
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
120.02	60	0.164	19.6	0.995	3.00%
277.01	60	0.077	19.8	0.923	7.07%

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*****