

Photometric Test Report

Relevant Standards

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

Prepared For RAB Lighting Inc.

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Project Number

DLF2212110

Report Number

DLF2212110-18a

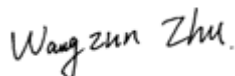
Test Date

2023/1/3

Issue Date

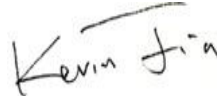
2023/1/5

Prepared By



Wangzun Zhu

Approved By



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 - Direct Linear Ambient Luminaires				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	1500		5318
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2008	≥375		1329
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	135.0
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		39.4
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	8.15%
		20.00%	277V	6.89%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.994
		0.9	277V	0.966
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029±355	4923
		4 step	5029±220	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥80		83
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥0		4
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		93
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%≤IES Rcs,h1≤+23%		-13%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥40%		71.66%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22		23.2
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		277
(Goniophotometer - Section 4.2)		Non-Wrost Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		0.148
(Goniophotometer - Section 4.2)		Non-Wrost Case		0.328
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		39.4
(Goniophotometer - Section 4.2)		Non-Wrost Case		39.1

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/1/3	GUSJR4/40W/5000K	R1
2	Goniophotometer Test	2023/1/3	GUSJR4/40W/5000K	R1
3	THD and PF Test	2023/1/3	GUSJR4/40W/5000K	R1

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.

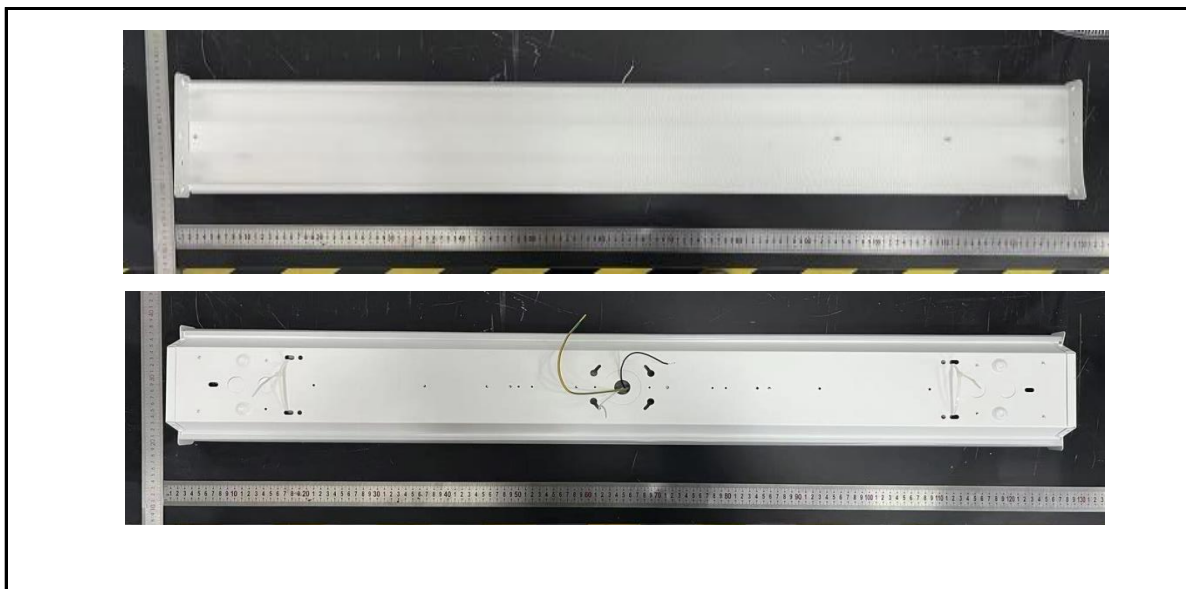
2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing 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 Production Description

Luminaire Description: GUSJR4/40W/5000K

Electrical Specification: 120V-277V,50/60HZ

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	GUSJR4/40W/5000K	Sample ID.	R1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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
119.96	60	0.325	38.8	0.994
277.01	60	0.146	39.1	0.966

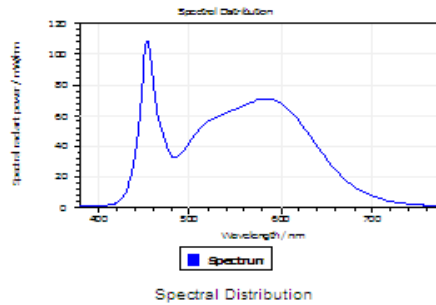
Test Result

CCT (K)	CRI	R9	Duv
4923	83	4	0.004

Rf	Rg	IES Rcs,h1
84	93	-13%

4.1 Integrating Sphere Test

Results



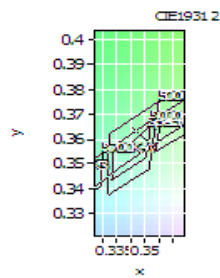
Spectral values

DominantWavelength 570.36 nm
Purity 0.132
PeakWavelength 453.95 nm
Radiant Power 13.61 W
Width50%:

Color Coordinates

Correlated Color Temperat 4923 K
x: 0.3482 u: 0.2095 u': 0.2095
y: 0.3622 v: 0.3268 v': 0.4902

CRI01	80.4	CRI09	4.3
CRI02	90.3	CRI10	76.4
CRI03	95.2	CRI11	77.9
CRI04	79.1	CRI12	56.4
CRI05	80.4	CRI13	83.4
CRI06	85.9	CRI14	97.7
CRI07	86.0	CRI15	73.7
CRI08	64.6	CRI16	69.4
ResultsCRI	82.7		



PlankDistance 4.0E-003

4.1 Integrating Sphere Test

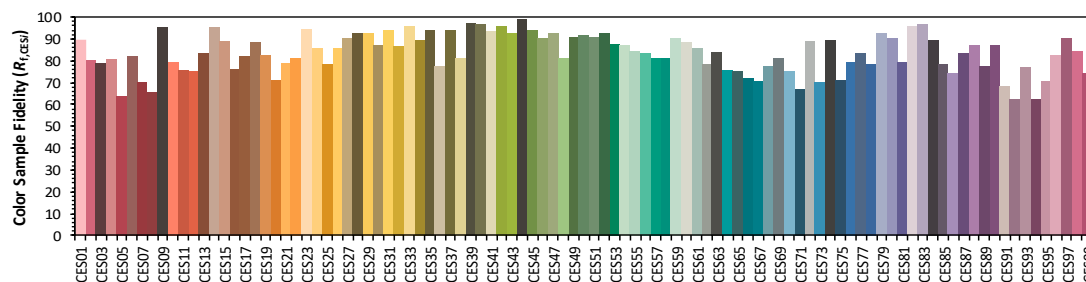
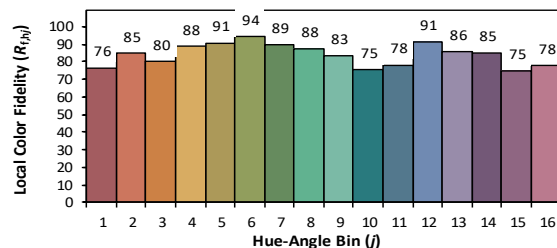
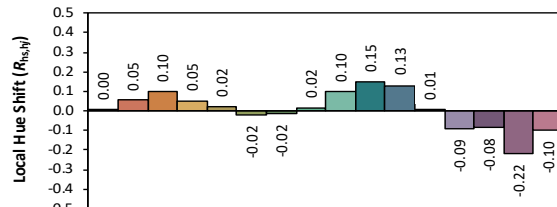
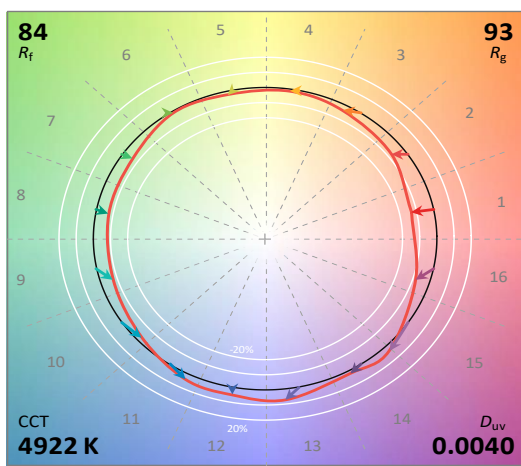
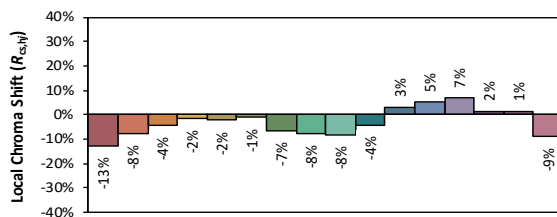
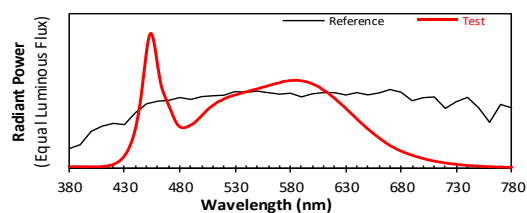
IES TM-30-18 Color Rendition Report

Source: DLF2212110-18a

Manufacturer: RAB Lighting Inc.

Date: 2023/1/3

Model: GUSJR4/40W/5000K



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

 x 0.3482 y 0.3622

u'	0.2095
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$$V' \quad 0.4902$$

CIE 13.3-1995
(CRI)

84 R_a $R_9 \quad 10$

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	GUSJR4/40W/5000K	Sample ID.	R1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method

The samples were tested according to the IES LM-79-2008.

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

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.

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 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
WROST CASE	277.01	60	0.148	39.4	0.964
NON-WROST CASE	120.01	60	0.328	39.1	0.992

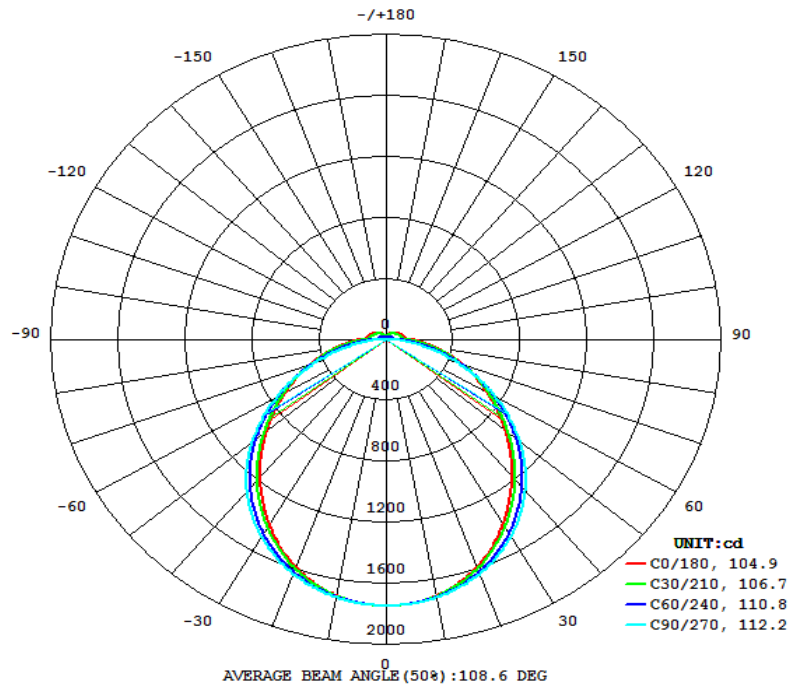
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
5318	175.1	161.2	104.9	112.2	135.0

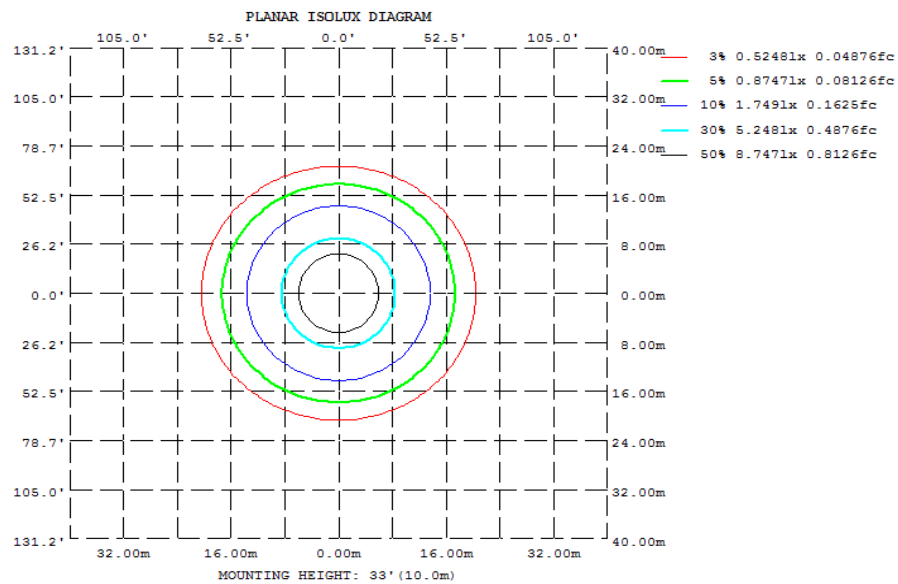
Zonal Lumen Requirement (0° - 60°)	UGR (X=4H, Y=8H, 70/50/20%)	Length(ft)	Lumen/ft
71.66%	23.2	4.00	1329

4.2 Goniophotometer Test

Light Distribution Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1707	1711	1717	1711	1707	1711	1717	1711
20	1587	1610	1635	1610	1587	1610	1635	1610
30	1399	1445	1493	1445	1399	1445	1493	1445
40	1173	1233	1295	1233	1173	1233	1295	1233
50	932.4	986.0	1047	986.0	932.4	986.0	1047	986.0
60	698.2	729.0	757.4	729.0	698.2	729.0	757.4	729.0
70	487.9	484.3	462.8	484.3	487.9	484.3	462.8	484.3
80	302.9	266.7	188.7	266.7	302.9	266.7	188.7	266.7
90	145.1	97.93	1.504	97.93	145.1	97.93	1.504	97.93
100	121.4	84.12	2.155	84.12	121.4	84.12	2.155	84.12
110	105.4	73.84	5.195	73.84	105.4	73.84	5.195	73.84
120	90.70	63.64	7.700	63.64	90.70	63.64	7.700	63.64
130	76.41	54.79	9.922	54.79	76.41	54.79	9.922	54.79
140	63.70	45.47	11.55	45.47	63.70	45.47	11.55	45.47
150	49.46	35.14	12.10	35.14	49.46	35.14	12.10	35.14
160	34.30	24.06	12.15	24.06	34.30	24.06	12.15	24.06
170	19.70	14.96	11.13	14.96	19.70	14.96	11.13	14.96
180	8.780	11.43	11.87	11.43	8.780	11.43	11.87	11.43
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										
X=2H Y=2H	UGR Viewed Crosswise					UGR Viewed Endwise				
3H	17.9	19.3	18.3	19.8	20.3	17.7	19.2	18.2	19.7	20.2
4H	19.5	20.8	19.9	21.3	21.8	19.8	21.1	20.3	21.6	22.1
6H	20.0	21.3	20.5	21.8	22.3	20.7	22.0	21.2	22.5	23.0
8H	20.3	21.5	20.8	22.0	22.6	21.6	22.8	22.1	23.3	23.8
12H	20.4	21.5	21.0	22.1	22.6	22.0	23.1	22.5	23.7	24.2
	20.5	21.5	21.0	22.1	22.6	22.4	23.5	23.0	24.0	24.6
4H 2H	18.4	19.7	19.0	20.2	20.7	18.4	19.6	18.9	20.1	20.6
4H 3H	20.3	21.3	20.8	21.9	22.4	20.6	21.7	21.1	22.2	22.8
4H 4H	20.9	21.9	21.5	22.5	23.1	21.7	22.6	22.2	23.2	23.8
4H 6H	21.4	22.3	22.0	22.8	23.4	22.7	23.6	23.3	24.1	24.7
4H 8H	21.5	22.3	22.1	22.9	23.5	23.2	24.0	23.8	24.6	25.2
4H 12H	21.6	22.3	22.2	22.9	23.5	23.7	24.4	24.3	25.0	25.7
8H 4H	21.3	22.1	21.9	22.7	23.3	22.0	22.8	22.5	23.3	23.9
8H 6H	21.9	22.6	22.5	23.2	23.8	23.1	23.8	23.7	24.4	25.1
8H 8H	22.1	22.7	22.7	23.3	24.0	23.8	24.4	24.4	25.0	25.6
8H 12H	22.2	22.8	22.8	23.4	24.1	24.4	25.0	25.0	25.6	26.3
12H 4H	21.4	22.1	22.0	22.7	23.3	22.0	22.7	22.6	23.3	23.9
12H 6H	22.1	22.7	22.7	23.2	23.9	23.2	23.8	23.8	24.4	25.1
12H 8H	22.3	22.8	22.9	23.4	24.1	23.9	24.4	24.5	25.0	25.7
Maximum UGR = 26.3										

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	165.02	0 - 10	165.02	3.10%
10-20	470.83	0 - 20	635.85	11.96%
20-30	706.94	0 - 30	1342.79	25.25%
30-40	840.38	0 - 40	2183.17	41.05%
40-50	859.24	0 - 50	3042.41	57.21%
50-60	768.10	0 - 60	3810.51	71.66%
60-70	597.18	0 - 70	4407.69	82.88%
70-80	385.79	0 - 80	4793.48	90.14%
80-90	177.35	0 - 90	4970.83	93.47%
90-100	86.23	0 - 100	5057.06	95.10%
100-110	73.54	0 - 110	5130.60	96.48%
110-120	60.71	0 - 120	5191.31	97.62%
120-130	47.70	0 - 130	5239.01	98.52%
130-140	35.21	0 - 140	5274.22	99.18%
140-150	23.58	0 - 150	5297.80	99.62%
150-160	13.25	0 - 160	5311.05	99.87%
160-170	5.55	0 - 170	5316.60	99.98%
170-180	1.25	0 - 180	5317.85	100.00%

4.2 Goniophotometer Test

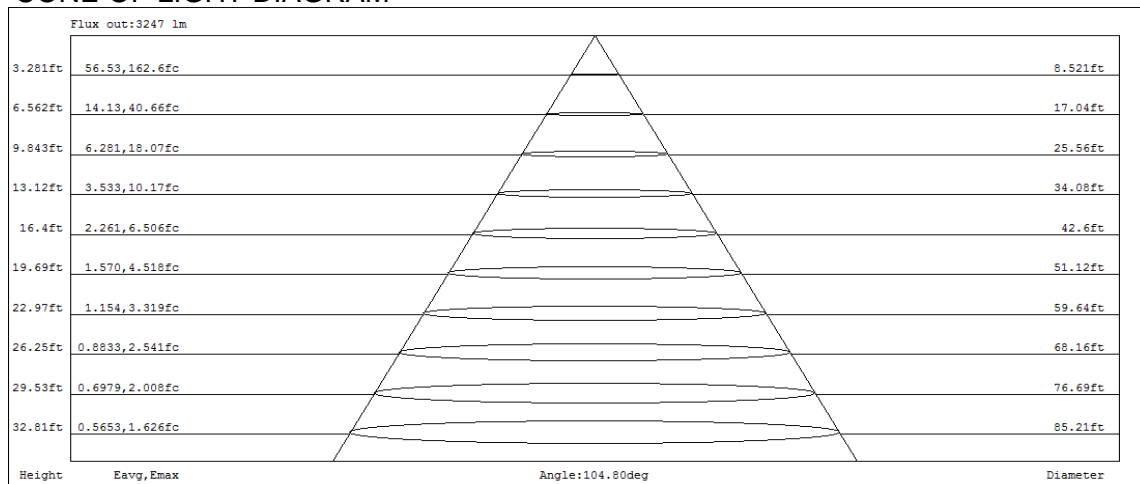
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
R/W	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	117	117	117	117	114	114	114	114	107	107	107	102	102	102	96	96	96	93
1	107	102	97	93	103	99	95	91	93	90	87	88	85	83	83	81	79	77
2	97	88	81	75	93	86	79	74	81	76	71	77	72	69	73	69	66	64
3	88	77	69	62	85	75	68	61	71	65	60	68	62	58	64	60	56	53
4	81	69	60	53	78	67	58	52	63	56	51	60	54	49	57	52	48	46
5	74	61	52	45	72	60	51	45	57	49	44	54	48	43	52	46	42	39
6	68	55	46	40	66	54	45	39	51	44	38	49	42	38	47	41	37	34
7	63	50	41	35	61	49	41	35	47	39	34	45	38	33	43	37	33	30
8	59	46	37	31	57	45	37	31	43	35	30	41	34	30	39	34	29	27
9	55	42	34	28	53	41	33	28	39	32	27	38	31	27	36	31	26	24
10	52	39	31	25	50	38	30	25	36	30	25	35	29	24	34	28	24	22

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	GUSJR4/40W/5000 K	Sample ID.	R1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method

The samples were tested according to the ANSI C82.77:2002.
 The total harmonic distortion shall be measured to the 40th order.
 The ambient temperature condition was maintained at 25° C ± 1° 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 were calculated.

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
119.96	60	0.325	38.8	0.994	8.15%
277.01	60	0.146	39.1	0.966	6.89%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2022/12/26	2023/12/25
DLF108	Auxiliary Lamp	2022/12/26	2023/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2022/12/26	2023/12/25
DLF116	AC Power Source	2022/12/26	2023/12/25
DLF113	Power Meter	2022/12/26	2023/12/25
DLF112	Temperature Recorder	2022/12/26	2023/12/25
DLF114	Temperature & Humidity Datalogger	2022/12/26	2023/12/25
DLF101	Goniophotometer	2022/12/26	2023/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2022/12/26	2023/12/25
DLF104	AC Power Source	2022/12/26	2023/12/25
DLF507	DC Power Source	2022/12/26	2023/12/25
DLF102	Power Meter	2022/12/26	2023/12/25
DLF111	Temperature & Humidity Datalogger	2022/12/26	2023/12/25
DLF119	Power Meter	2022/12/26	2023/12/25
DLF031	Temperature data logger	2022/12/26	2023/12/25
DLF022	Digital power meter	2022/12/26	2023/12/25
DLF003	Temperature & Humidity Datalogger	2022/12/26	2023/12/25

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