

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Room 6A33, No.1388, Wuzhong road, Shanghai, China

Xiao Xiang, 15921313292, Gary.Xiao@rabweb.com

Prepared By

Deliver Co., Ltd.

Block 11, 78 Keling Road, SSTP, Suzhou, China

0512-66801950, kevin.jia@szdeliver.com

Project Number

DLF2208102

Report Number

DLF2208102-6a

Test Date

2022/8/2

Issue Date

2022/8/3

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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

This report shall not be reproduced, except in full, without written approval of Deliver Co., Ltd.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP.

1.0 Test Summary

DLC Technical Requirements v5.1

Outdoor - Architectural Flood and Spot Luminaires				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	1000		1856
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	145.0
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		12.8
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.33%
		20.00%	277V	9.93%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.991
		0.9	277V	0.926
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029±355	4933
		4 step	5029±220	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥70		84
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	-		11
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		96
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-12%
Zonal Lumen Requirement (0°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	85%		100.00%
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.050
(Goniophotometer - Section 4.2)		Non-Worst Case		0.099
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		12.8
(Goniophotometer - Section 4.2)		Non-Worst Case		11.7

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2022/8/2	FFLEDXS @ 13W / 5000K	F1
2	Goniophotometer Test	2022/8/2	FFLEDXS @ 13W / 5000K	F1
3	THD and PF Test	2022/8/2	FFLEDXS @ 13W / 5000K	F1

Remark(If any)

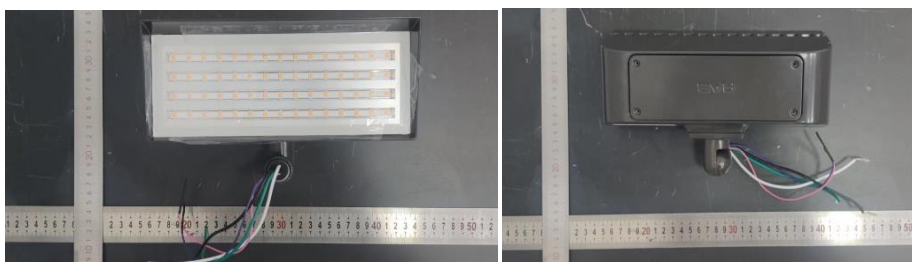
- 1、 This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.
- 2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without 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: FFLEDXS @ 13W / 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.	FFLEDXS @ 13W / 5000K	Sample ID.	F1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.4	Humidity (%RH)	54.0

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
119.98	60	0.099	11.8	0.991
277.00	60	0.050	12.7	0.926

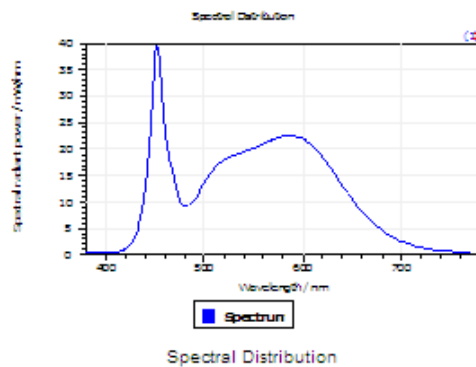
Test Result

CCT (K)	CRI	R9	Duv
4933	84	11	0.00078

Rf	Rg	IES Rcs,h1
84	96	-12%

4.1 Integrating Sphere Test

Results

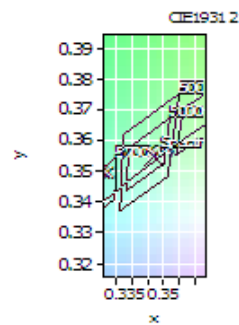


Spectral values

DominantWavelength 572.81 nm
Purity 0.107
PeakWavelength 452.23 nm
Radiant Power 4.387 W
Width50%:

Color Coordinates

Correlated Color Temperat 4933 K
x: 0.3472 u: 0.2116 u': 0.2116
y: 0.3548 v: 0.3244 v': 0.4865
CRI01 82.3 CRI09 11.2
CRI02 90.2 CRI10 76.2
CRI03 94.4 CRI11 81.3
CRI04 82.1 CRI12 57.7
CRI05 82.4 CRI13 84.7
CRI06 85.5 CRI14 97.4
CRI07 87.0 CRI15 76.6
CRI08 67.3 CRI16 72.7
ResultsCRI 83.9



PlanckDistance 7.8E-004

4.1 Integrating Sphere Test

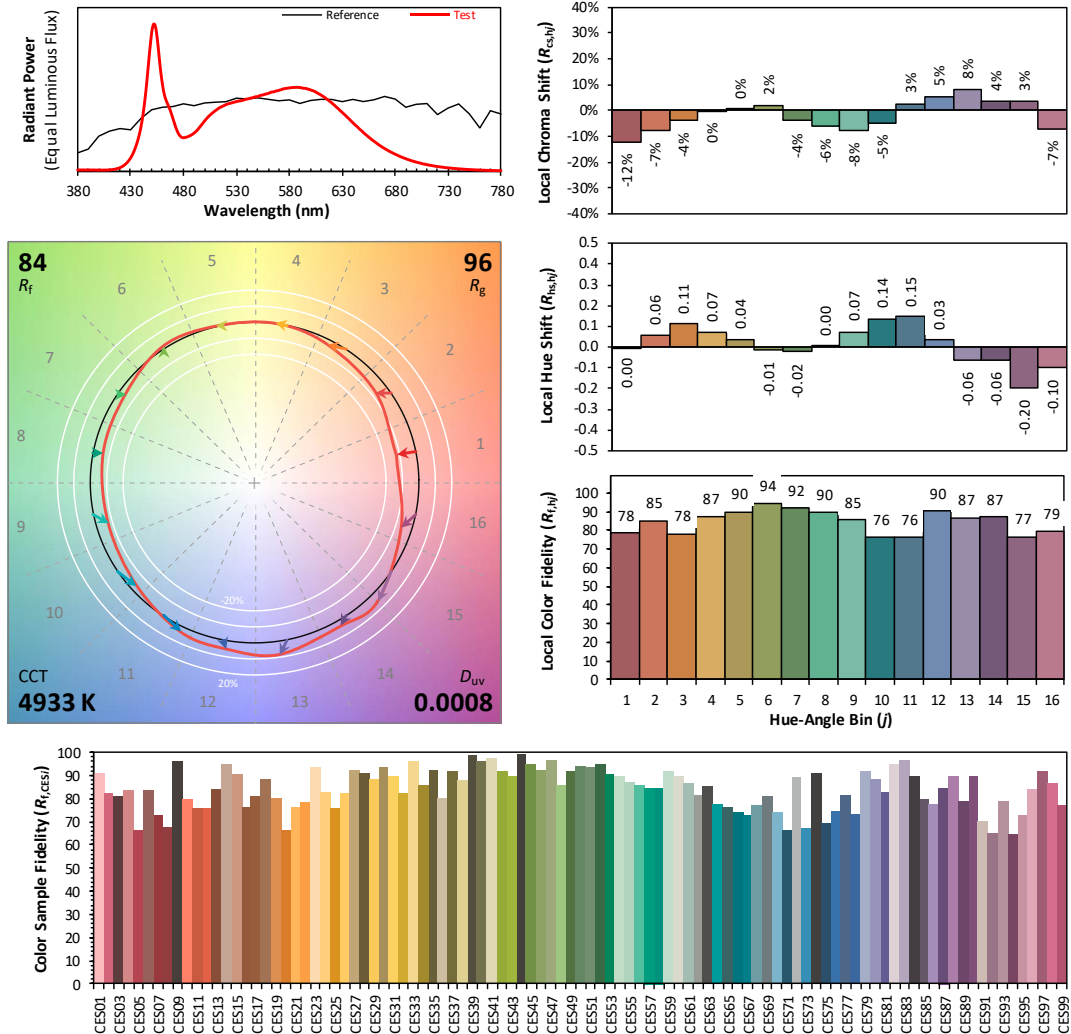
IES TM-30-18 Color Rendition Report

Source: DLF2208102-6a

Manufacturer: RAB Lighting Inc.

Date: 2022/8/2

Model: FFLEDXS @ 13W / 5000K



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

x 0.3472
 y 0.3548
 u' 0.2116
 v' 0.4865

CIE 13.3-1995
(CRI)

R_a 85
 R_g 18

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	FFLEDXS @ 13W / 5000K	Sample ID.	F1
Operate 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 parameters 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
WORST CASE	276.97	60	0.050	12.8	0.923
NON-WORST CASE	120.02	60	0.099	11.7	0.988

Test Result

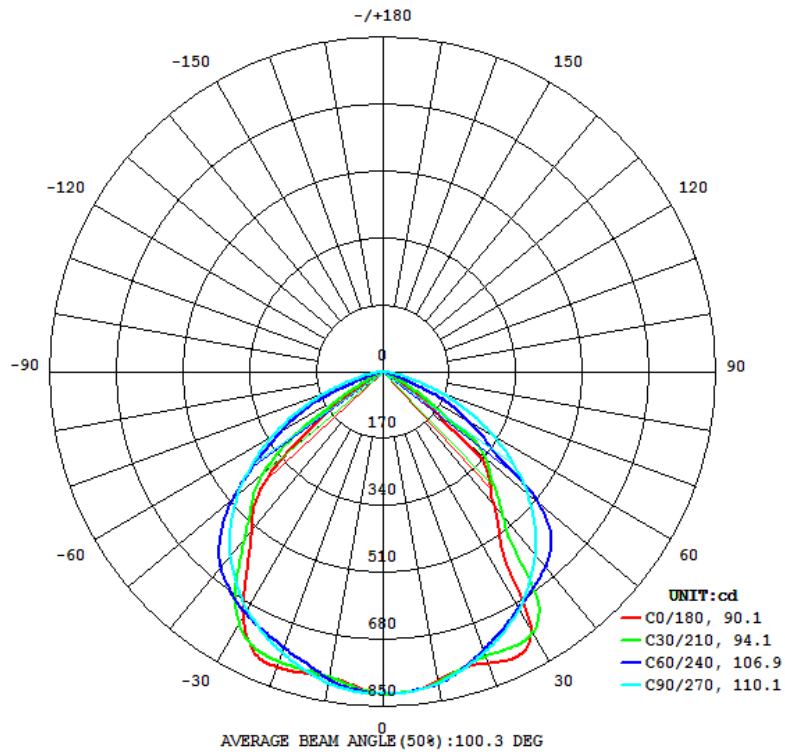
Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
1856	115.0	150.6	90.1	110.1	145.0

Zonal Lumen Requirement
(0° - 90°)

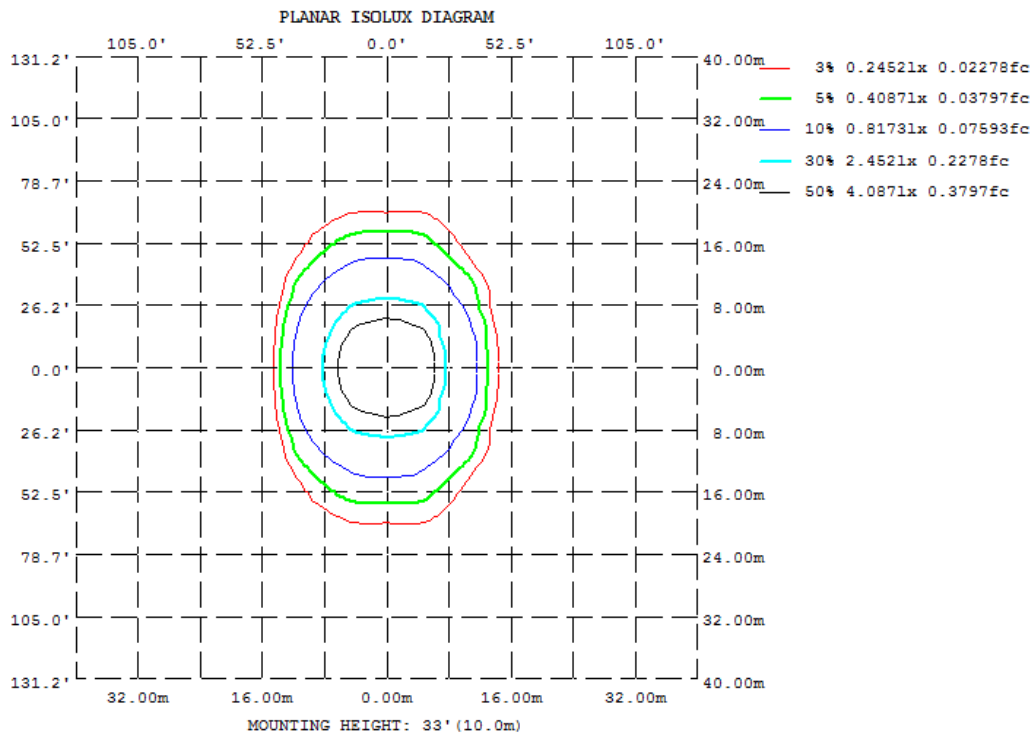
100.00%

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	796.0	803.6	802.6	787.9	788.2	787.9	802.6	803.6
20	787.3	752.6	757.4	761.7	797.5	761.7	757.4	752.6
30	758.2	733.2	696.5	735.2	715.3	735.2	696.5	733.2
40	443.6	645.2	606.2	616.1	521.0	616.1	606.2	645.2
50	246.7	364.0	484.1	426.9	330.7	426.9	484.1	364.0
60	41.22	177.3	329.2	226.9	44.14	226.9	329.2	177.3
70	0.8539	8.559	161.8	19.57	13.48	19.57	161.8	8.559
80	0.0260	0.0351	30.26	4.887	4.234	4.887	30.26	0.0351
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

	Zonal (lm)		Total (lm)	Percent
0-10	77.31	0 - 10	77.31	4.16%
10-20	221.59	0 - 20	298.90	16.10%
20-30	347.79	0 - 30	646.69	34.84%
30-40	406.03	0 - 40	1052.72	56.71%
40-50	384.20	0 - 50	1436.91	77.41%
50-60	269.64	0 - 60	1706.56	91.93%
60-70	118.48	0 - 70	1825.04	98.31%
70-80	29.06	0 - 80	1854.09	99.88%
80-90	2.25	0 - 90	1856.34	100.00%
90-100	0.00	0 - 100	1856.34	100.00%
100-110	0.00	0 - 110	1856.34	100.00%
110-120	0.00	0 - 120	1856.34	100.00%
120-130	0.00	0 - 130	1856.34	100.00%
130-140	0.00	0 - 140	1856.34	100.00%
140-150	0.00	0 - 150	1856.34	100.00%
150-160	0.00	0 - 160	1856.34	100.00%
160-170	0.00	0 - 170	1856.34	100.00%
170-180	0.00	0 - 180	1856.34	100.00%

4.2 Goniophotometer Test

Axial Candela

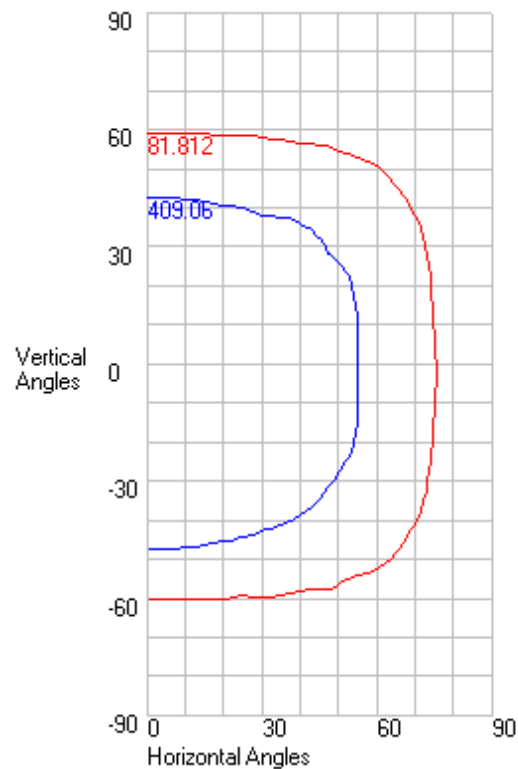
DEG.	HOR.	DEG.	VERT.
90	0	90	0
85	3.11	85	0.02
75	86.21	75	0.04
65	244.41	65	6.36
55	409.53	55	133.43
47.5	518.35	47.5	356.8
42.5	579.36	42.5	410.74
37.5	630.78	37.5	483.74
33	671.5	33	582.88
29	702.76	29	776.36
25.5	726.72	25.5	799.4
22.5	744.18	22.5	795.13
19.5	760.03	19.5	785.33
17	772.92	17	779.3
15	782.19	15	780.11
13	790.18	13	784.6
11	798.56	11	791.09
9	806.39	9	801.4
7	811.67	7	810.07
5	814.55	5	814.2
3	816.74	3	815.47
1	817.88	1	818.12
0	817.35	0	817.35
-1	817.88	-1	816.49
-3	816.74	-3	811.75
-5	814.55	-5	802.77
-7	811.67	-7	793.65
-9	806.39	-9	789.15
-11	798.56	-11	787.91
-13	790.18	-13	789.21
-15	782.19	-15	791.77
-17	772.92	-17	796.11
-19.5	760.03	-19.5	797.31
-22.5	744.18	-22.5	795.99
-25.5	726.72	-25.5	777.98
-29	702.76	-29	732.68
-33	671.5	-33	648.46
-37.5	630.78	-37.5	558.27
-42.5	579.36	-42.5	492.76
-47.5	518.35	-47.5	406.87
-55	409.53	-55	147.49
-65	244.41	-65	21.25
-75	86.21	-75	7.21
-85	3.11	-85	2.33
-90	0	-90	0

4.2 Goniophotometer Test

Characteristics

NEMA Type	7 H x 6 V
Maximum Candela	818.12
Maximum Candela Angle	0 H 1 V
Horizontal Beam Angle (50%)	110.2
Vertical Beam Angle (50%)	90
Horizontal Field Angle (10%)	151
Vertical Field Angle (10%)	119.3
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	1465
Beam Efficiency	N.A.
Field Lumens	1811
Field Efficiency	N.A.
Spill Lumens	45
Luminaire Lumens	1856
Total Efficiency	N.A.
Total Luminaire Watts	12.8
Ballast Factor	1

ISOCANDELA CURVES



Axial Candela

	0	1	3	5	7	9	11	13	15	17	19.5	22.5	25.5	29	33	37.5	42.5	47.5	55	65	75	85	90
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0
75	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.04	0.06	0.06	0.05	0.13	0.08	0.38	0.11	0.12	0
65	6.36	6.42	6.55	6.55	6.54	6.47	6.35	6.16	6.31	6.51	6.62	6.39	6.03	7.12	8.2	6.12	5.68	10.06	4.55	7.49	1.44	0.17	0
55	133.43 *	134.56 *	136.81 *	135.8 *	135.1 *	133.6 *	131.39 *	130.01 *	128.61 *	127.27 *	125.37 *	122.43 *	118.25 *	118.6 *	106.52 *	99.79 *	93.12 *	87.89 *	55.78	35.85	7.84	0.28	0
47.5	356.8 *	357.14 *	357.2 *	356.46 *	354.97 *	352.23 *	349.15 *	346.21 *	340.73 *	334.52 *	322.1 *	321.1 *	311.32 *	277.79 *	266.44 *	263.89 *	205.04 *	183.91 *	147.47 *	70.04	17.4	0.59	0
42.5	410.74 *	410.88 *	410.62 *	409.62 *	407.87 *	405.48 *	403.57 *	403.19 *	398.09 *	391.94 *	384.53 *	379.27 *	372.16 *	358.42 *	336.38 *	322.81 *	290.81 *	242.13 *	207.6 *	98.83 *	28.19	0.84	0
37.5	483.74 *	484.58 *	485.08 *	484.01 *	482.31 *	477.49 *	475.44 *	472.29 *	467.4 *	461.49 *	453.09 *	450.7 *	436.45 *	420.02 *	410.93 *	409.14 *	346.69 *	299.15 *	256.21 *	131.13 *	38.38	1.12	0
33	582.88 *	589.3 *	596.69 *	597.79 *	590.26 *	585.95 *	596.15 *	601.53 *	589.35 *	564.36 *	556.76 *	576.46 *	574.02 *	506.36 *	495.38 *	499.73 *	444.38 *	353.39 *	296.71 *	167.76 *	47.04	1.42	0
29	776.36 *	777.04 *	776.16 *	774.14 *	771.29 *	763.67 *	755.17 *	744.59 *	738.92 *	729.15 *	705.13 *	678.89 *	684.41 *	645.44 *	572.06 *	572.14 *	521.07 *	398.57 *	333.53 *	193.49 *	54.12	1.72	0
25.5	799.4 *	798.83 *	797.62 *	796.36 *	793.49 *	786.65 *	779.53 *	772.55 *	763.4 *	751.75 *	738.23 *	725.25 *	705.19 *	673.97 *	634.71 *	614.15 *	544.53 *	442.21 *	364.06 *	209.95 *	60.05	1.96	0
22.5	795.13 *	794.29 *	792.96 *	791.94 *	788.49 *	782.7 *	776.65 *	769.67 *	760.76 *	751.19 *	738.91 *	724.38 *	705.02 *	679.11 *	650.77 *	615.64 *	555.09 *	472.17 *	387.91 *	221.19 *	64.75	2.16	0
19.5	785.33 *	784.58 *	783.57 *	783.12 *	778.92 *	773.87 *	768.6 *	761.22 *	752.39 *	743.07 *	732.88 *	718.35 *	699.86 *	675.58 *	650.73 *	614.84 *	558.33 *	487.95 *	394.14 *	229.99 *	69.12	2.34	0
17	779.3 *	778.85 *	778.08 *	776.65 *	773.57 *	769.3 *	763.68 *	756.7 *	747.7 *	738.92 *	729.97 *	715.38 *	695.17 *	675.88 *	650.65 *	613.35 *	558.34 *	493.08 *	399.04 *	236.13 *	72.46	2.48	0
15	780.11 *	780.09 *	779.54 *	777.97 *	775.26 *	770.72 *	764.31 *	756.68 *	748.45 *	740.87 *	730.38 *	714.02 *	696.4 *	678.68 *	651.09 *	612.12 *	556.84 *	498.01 *	402.65 *	239.91 *	74.91	2.59	0
13	784.6 *	784.74 *	784.08 *	782.43 *	779.76 *	775.07 *	768 *	759.84 *	753.11 *	744.88 *	732.61 *	717.04 *	702.36 *	682.29 *	652.14 *	610.84 *	560.2 *	502.57 *	406.07 *	242.64 *	77.13	2.69	0
11	791.09 *	791.49 *	790.81 *	789.47 *	786.26 *	781.42 *	773.9 *	767.46 *	759.44 *	749.85 *	737.78 *	724.22 *	708.36 *	686.23 *	653.5 *	612.52 *	564.44 *	506.77 *	408.15 *	244.68 *	79.14	2.93	0
9	801.4 *	801.9 *	800.61 *	798.41 *	795.63 *	789.95 *	783.06 *	775.57 *	766.69 *	756.89 *	745.37 *	731.07 *	714.22 *	690.03 *	657.79 *	617.63 *	568.88 *	510.42 *	409.93 *	246.04 *	80.93	2.96	0
7	810.07 *	810.52 *	809.21 *	806.97 *	804.03 *	798.36 *	791.31 *	782.47 *	773.44 *	763.81 *	751.98 *	737.16 *	719.41 *	694.42 *	662.08 *	622.55 *	572.6 *	513.52 *	411.07 *	246.75 *	82.5 *	2.99	0
5	814.2 *	814.43 *	813.12 *	810.81 *	808.14 *	802.96 *	795.52 *	786.42 *	778.08 *	769.18 *	756.99 *	741 *	722.8 *	698.05 *	666.02 *	625.56 *	575.52 *	515.93 *	411.52 *	246.83 *	84.56 *	3.03	0
3	815.47 *	815.45 *	814.27 *	812.17 *	810.3 *	804.91 *	796.43 *	788.27 *	780.69 *	771.66 *	758.96 *	742.94 *	725.09 *	700.64 *	668.96 *	628.26 *	577.66 *	517.53 *	412.13 *	246.92 *	85.22 *	3.06	0
1	818.12 *	817.84 *	817.19 *	815 *	811.87 *	806.42 *	798.46 *	789.94 *	782.11 *	772.92 *	759.93 *	744.01 *	726.41 *	702.37 *	671.01 *	630.15 *	579 *	518.29 *	410.4 *	245.25 *	85.88 *	3.11	0
0	817.35 *	817.88 *	816.74 *	814.55 *	811.67 *	806.39 *	798.56 *	790.18 *	782.19 *	772.92 *	760.03 *	744.18 *	726.72 *	702.76 *	671.5 *	630.78 *	579.36 *	518.35 *	409.53 *	244.41 *	86.21 *	3.11	0
-1	816.49 *	816.1 *	815.49 *	813.51 *	810.25 *	804.94 *	797.34 *	788.86 *	780.59 *	771.06 *	757.85 *	741.96 *	724.57 *	701.03 *	670.25 *	629.95 *	579.24 *	518.95 *	410.78 *	245.09 *	86.2 *	3.11	0
-3	811.75 *	811.42 *	810.85 *	808.51 *	805.65 *	799.85 *	793.16 *	784.75 *	775.87 *	765.98 *	752.65 *	736.8 *	719.58 *	696.67 *	666.72 *	627.7 *	578.42 *	519.53 *	413.28 *	246.45 *	86.19 *	3.1	0
-5	802.77 *	803.44 *	802.3 *	800.87 *	797.86 *	791.79 *	785.2 *	777.48 *	769.47 *	759.9 *	746.31 *	730.8 *	713.72 *	691.6 *	662.41 *	624.7 *	576.85 *	519.34 *	413.41 *	246.05 *	86.18 *	3.1	0
-7	793.65 *	793.87 *	793.13 *	791.79 *	788.46 *	784.27 *	776.04 *	768.6 *	762.19 *	754.16 *	742.01 *	725.43 *	706.95 *	685.75 *	657.27 *	621.47 *	574.62 *	518.45 *	413.64 *	245.68 *	84.75 *	3.09	0
-9	789.15 *	789.02 *	788.27 *	786.73 *	784.15 *	778.81 *	772.39 *	764.68 *	755.45 *	748.65 *	738.41 *	723.73 *	705.75 *	681.19 *	651.95 *	616.52 *	571.68 *	516.9 *	413.15 *	244.69 *	83.8 *	3.09	0
-11	787.91 *	787.59 *	786.93 *	785.29 *	782.13 *	777.31 *	770.37 *	763.4 *	755.67 *	746.11 *	734.92 *	722.05 *	705.83 *	682.98 *	649.48 *	611.54 *	568.17 *	514.76 *	411.93 *	243.06 *	82.62 *	3.08	0
-13	789.21 *	788.71 *	788.02 *	786.09 *	783.71 *	778.56 *	771.4 *	764.02 *	756.61 *	747.91 *	735.28 *	720.95 *	705.85 *	684.25 *	651.54 *	610.51 *	564.96 *	512.12 *	410.34 *	240.79 *	81.2	2.86	0
-15	791.77 *	791.16 *	790.43 *	788.74 *	785.77 *	781.45 *	774.42 *	766.66 *	758.79 *	750.12 *	737.87 *	722.13 *	706 *	685.08 *	652.88 *	612.09 *	561.35 *	508.82 *	407.29 *	237.85 *	79.54	2.79	0
-17	796.11 *	795.34 *	794.11 *	792.47 *	788.45 *	784.22 *	777.54 *	769.24 *	761.06 *	752.43 *	739.83 *	724.31 *	707.11 *	685.6 *	653.88 *	612.52 *	559.59 *	504.8 *	403.96 *	234.09 *	77.64	2.7	0
-19.5	797.31 *	796.8 *	795.83 *	794.88 *	790.45 *	785.23 *	779.12 *	770.9 *	762.36 *	753.17 *	741.8 *	725.42 *	706.94 *	684.51 *	654.57 *	611.27 *	554.93 *	495.75 *	398.91 *	228.31 *	74.94	2.59	0
-22.5	795.99 *	795.59 *	794.57 *	793.46 *	788.76 *	782.4 *	776.15 *	768.65 *	758.44 *	748.91 *	738.17 *	722.37 *	700.54 *	675.38 *	651.15 *	606.02 *	546.37 *	480.92 *	391.55 *	220.24 *	71.13	2.43	0
-25.5	777.98 *	778.14 *	777.55 *	775.9 *	772.15 *	765.9 *	758.77 *	751.44 *	741.99 *	731.69 *	720.12 *	707.03 *	684.75 *	657.34 *	628.67 *	595.49 *	530.9 *	461.69 *	371.69 *	210.38 *	66.72	2.25	0
-29	732.68 *	733.74 *	733.48 *	731.53 *	727.81 *	722.47 *	716.23 *	709.14 *	701.72 *	692.61 *	679.71 *	665.6 *	651.41 *	623.52 *	588.62 *	560.07 *	505.77 *	433.59 *	345.94 *	197.32 *	60.88	2.02	0
-33	648.46 *	650.15 *	650.71 *	649.03 *	644.8 *	641.65 *	637.3 *	632.87 *	626.04 *	616.81 *	606.74 *	597.02 *	583.62 *	557.5 *	530.77 *	505.39 *	460.74 *	394.55 *	315.17 *	179.81 *	53.76	1.73	0
-37.5	558.27 *	558.96 *	559.18 *	557.74 *	555.54 *	550.27 *	548.35 *	545.54 *	540.69 *	534.21 *	523.51 *	516.89 *	505.67 *	486.51 *	462.22 *	443.87 *	401.23 *	346.5 *	278.47 *	151.94 *	44.79	1.43	0
-42.5	492.76 *	492.94 *	492.66 *	491.54 *	489.59 *	486.65 *	483.32 *	480.54 *	474.5 *	468.7 *	460.88 *	452.92 *	439.57 *	420.78 *	400.73 *	380.1 *	337.25 *	291.12 *	230.98 *	116.2 *	34.1	1.15	0
-47.5	406.87 *	407.95 *	408.93 *	408.47 *	406.75 *	403.32 *	398.17 *	394.47 *	390.09 *	385.43 *	378.99 *	370.57 *	355.49 *	338.03 *	322.29 *	302.43 *	254.57 *	222.46 *	171.64 *	85.77 *	23.53	0.89	0
-55	147.49 *	149.55 *	153.68 *	152.82 *	152.09 *	149.71 *	145.64 *	143.65 *	146.35 *	147.46 *	146.43 *	140.35 *	129.87 *	134.78 *	134.19 *	117.38 *	104.22 *	105.31 *	67.33	49.91	11.26	0.54	0
-65	21.25	21.27	21.32	21.28	21.25	21.17	21.07	20.93	20.87	20.74	20.52	20.16	19.89	20.37	19.97	18.23	18.38	20.13	14.18	15.53	4.72	0.4	0
-75	7.21	7.23	7.26	7.29	7.23	7.21	7.18	7.13	7.09	7.07	7.01	6.87	6.73	6.55	6.5	6.16	5.68	5.65	4.85	3.5	1.51	0.31	0
-85	2.33	2.33	2.33	2.32	2.32	2.32	2.32	2.3	2.29	2.27	2.24	2.2	2.16	2.11	2.02	1.91	1.74	1.58	1.31	1	0.64	0.12	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0

LUMEN TABULATION

	0	1	3	5	7	9	11	13	15	17	20	23	26	29	33	38	43	48	55	65	75	85	90 Total
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0
65	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.4	0.1	0	0	0
55	0.56 *	1.13 *	1.12 *	1.12 *	1.10 *	1.09 *	1.07 *	1.05 *	1.02 *	1.23 *	1.43 *	1.37 *	1.47 *	1.51 *	1.55 *	1.45 *	1.15 *	1.27 *	0.9	0.3	0	0	0
47.5	0.58 *	1.17 *	1.17 *	1.16 *	1.15 *	1.13 *	1.12 *	1.10 *	1.07 *	1.30 *	1.50 *	1.44 *	1.56 *	1.62 *	1.66 *	1.58 *	1.24 *	1.40 *	1.00 *	0.3	0	0	0
42.5	0.68 *	1.36 *	1.36 *	1.35 *	1.34 *	1.32 *	1.31 *	1.29 *	1.26 *	1.53 *	1.78 *	1.71 *	1.88 *	1.99 *	2.07 *	2.00 *	1.59 *	1.80 *	1.32 *	0.4	0.1	0	0
37.5	0.73 *	1.48 *	1.48 *	1.47 *	1.45 *	1.44 *	1.44 *	1.42 *	1.37 *	1.66 *	1.95 *	1.91 *	2.06 *	2.15 *	2.29 *	2.23 *	1.75 *	1.94 *	1.46 *	0.45 *	0.1	0	0
33	0.83 *	1.67 *	1.67 *	1.66 *	1.64 *	1.62 *	1.61 *	1.58 *	1.54 *	1.85 *	2.15 *	2.10 *	2.28 *	2.32 *	2.39 *	2.38 *	1.85 *	1.98 *	1.51 *	0.48 *	0.1	0	0
29	0.84 *	1.68 *	1.67 *	1.66 *	1.64 *	1.62 *	1.59 *	1.56 *	1.53 *	1.85 *	2.13 *	2.04 *	2.25 *	2.31 *	2.34 *	2.30 *	1.80 *	1.92 *	1.47 *	0.47 *	0.1	0	0
25.5	0.73 *	1.45 *	1.45 *	1.44 *	1.43 *	1.41 *	1.38 *	1.36 *	1.33 *	1.62 *	1.87 *	1.79 *	1.96 *	2.07 *	2.11 *	2.04 *	1.63 *	1.79 *	1.35 *	0.43 *	0.1	0	0
22.5	0.72 *	1.44 *	1.44 *	1.43 *	1.41 *	1.40 *	1.37 *	1.35 *	1.32 *	1.61 *	1.86 *	1.78 *	1.96 *	2.08 *	2.13 *	2.05 *	1.67 *	1.87 *	1.41 *	0.46 *	0.1	0	0
19.5	0.60 *	1.19 *	1.19 *	1.18 *	1.17 *	1.15 *	1.14 *	1.11 *	1.09 *	1.33 *	1.54 *	1.48 *	1.63 *	1.73 *	1.77 *	1.71 *	1.41 *	1.58 *	1.20 *	0.40 *	0.1	0	0
17	0.47 *	0.95 *	0.95 *	0.94 *	0.93 *	0.92 *	0.91 *	0.89 *	0.87 *	1.06 *	1.23 *	1.18 *	1.30 *	1.39 *	1.41 *	1.37 *	1.13 *	1.28 *	0.97 *	0.32 *	0	0	0
15	0.48 *	0.95 *	0.95 *	0.94 *	0.94 *	0.92 *	0.91 *	0.89 *	0.87 *	1.07 *	1.23 *	1.18 *	1.31 *	1.39 *	1.41 *	1.36 *	1.14 *	1.29 *	0.98 *	0.33 *	0	0	0
13	0.48 *	0.96 *	0.96 *	0.95 *	0.94 *	0.93 *	0.91 *	0.90 *	0.88 *	1.07 *	1.24 *	1.19 *	1.32 *	1.40 *	1.42 *	1.37 *	1.15 *	1.30 *	0.99 *	0.33 *	0	0	0
11	0.49 *	0.97 *	0.97 *	0.96 *	0.95 *	0.94 *	0.92 *	0.91 *	0.89 *	1.08 *	1.25 *	1.20 *	1.33 *	1.40 *	1.42 *	1.38 *	1.16 *	1.31 *	1.00 *	0.34 *	0	0	0
9	0.49 *	0.98 *	0.98 *	0.97 *	0.96 *	0.95 *	0.93 *	0.92 *	0.90 *	1.09 *	1.26 *	1.21 *	1.34 *	1.41 *	1.43 *	1.39 *	1.17 *	1.32 *	1.00 *	0.34 *	0	0	0
7	0.49 *	0.99 *	0.98 *	0.98 *	0.97 *	0.96 *	0.94 *	0.92 *	0.90 *	1.10 *	1.27 *	1.22 *	1.34 *	1.42 *	1.44 *	1.40 *	1.17 *	1.32 *	1.00 *	0.34 *	0.1	0	0
5	0.50 *	0.99 *	0.99 *	0.98 *	0.97 *	0.96 *	0.94 *	0.93 *	0.91 *	1.11 *	1.28 *	1.22 *	1.35 *	1.43 *	1.45 *	1.40 *	1.18 *	1.33 *	1.00 *	0.35 *	0.1	0	0
3	0.50 *	0.99 *	0.99 *	0.98 *	0.98 *	0.96 *	0.95 *	0.93 *	0.91 *	1.11 *	1.28 *	1.23 *	1.35 *	1.43 *	1.45 *	1.41 *	1.18 *	1.33 *	1.00 *	0.35 *	0.1	0	0
1	0.25 *	0.50 *	0.50 *	0.49 *	0.49 *	0.48 *	0.47 *	0.46 *	0.46 *	0.55 *	0.64 *	0.61 *	0.68 *	0.72 *	0.73 *	0.71 *	0.59 *	0.66 *	0.50 *	0.17 *	0	0	0
0	0.25 *	0.50 *	0.50 *	0.49 *	0.49 *	0.48 *	0.47 *	0.46 *	0.45 *	0.55 *	0.64 *	0.61 *	0.68 *	0.72 *	0.73 *	0.71 *	0.59 *	0.66 *	0.50 *	0.17 *	0	0	0

-1	0.50 *	0.99 *	0.99 *	0.98 *	0.97 *	0.96 *	0.94 *	0.93 *	0.91 *	1.10 *	1.28 *	1.22 *	1.35 *	1.43 *	1.45 *	1.41 *	1.18 *	1.33 *	1.00 *	0.35 *	0.1	0	0
-3	0.49 *	0.98 *	0.98 *	0.97 *	0.96 *	0.95 *	0.94 *	0.92 *	0.90 *	1.09 *	1.27 *	1.21 *	1.34 *	1.42 *	1.44 *	1.40 *	1.18 *	1.33 *	1.00 *	0.35 *	0.1	0	0
-5	0.49 *	0.97 *	0.97 *	0.96 *	0.95 *	0.94 *	0.93 *	0.91 *	0.89 *	1.09 *	1.26 *	1.20 *	1.33 *	1.41 *	1.44 *	1.40 *	1.18 *	1.33 *	1.00 *	0.34 *	0.1	0	0
-7	0.48 *	0.96 *	0.96 *	0.95 *	0.95 *	0.93 *	0.92 *	0.90 *	0.88 *	1.08 *	1.25 *	1.19 *	1.32 *	1.40 *	1.43 *	1.39 *	1.17 *	1.33 *	1.00 *	0.34 *	0.1	0	0
-9	0.48 *	0.96 *	0.96 *	0.95 *	0.94 *	0.93 *	0.91 *	0.90 *	0.88 *	1.07 *	1.25 *	1.19 *	1.32 *	1.39 *	1.42 *	1.38 *	1.17 *	1.33 *	1.00 *	0.34 *	0.1	0	0
-11	0.48 *	0.96 *	0.96 *	0.95 *	0.94 *	0.93 *	0.91 *	0.90 *	0.88 *	1.07 *	1.24 *	1.19 *	1.32 *	1.39 *	1.41 *	1.37 *	1.16 *	1.32 *	0.99 *	0.34 *	0	0	0
-13	0.48 *	0.96 *	0.96 *	0.95 *	0.94 *	0.93 *	0.92 *	0.90 *	0.88 *	1.07 *	1.24 *	1.19 *	1.32 *	1.40 *	1.41 *	1.37 *	1.16 *	1.31 *	0.99 *	0.33 *	0	0	0
-15	0.48 *	0.97 *	0.96 *	0.96 *	0.95 *	0.94 *	0.92 *	0.90 *	0.88 *	1.08 *	1.25 *	1.19 *	1.32 *	1.40 *	1.42 *	1.37 *	1.15 *	1.30 *	0.98 *	0.33 *	0	0	0
-17	0.61 *	1.21 *	1.21 *	1.20 *	1.19 *	1.17 *	1.15 *	1.13 *	1.11 *	1.35 *	1.56 *	1.49 *	1.65 *	1.75 *	1.77 *	1.70 *	1.42 *	1.61 *	1.20 *	0.40 *	0.1	0	0
-20	0.73 *	1.45 *	1.45 *	1.44 *	1.42 *	1.41 *	1.38 *	1.36 *	1.33 *	1.62 *	1.87 *	1.79 *	1.97 *	2.09 *	2.12 *	2.03 *	1.68 *	1.89 *	1.41 *	0.46 *	0.1	0	0
-23	0.72 *	1.44 *	1.43 *	1.42 *	1.41 *	1.39 *	1.37 *	1.34 *	1.31 *	1.59 *	1.85 *	1.76 *	1.93 *	2.05 *	2.08 *	1.99 *	1.63 *	1.83 *	1.36 *	0.44 *	0.1	0	0
-26	0.81 *	1.61 *	1.61 *	1.59 *	1.58 *	1.56 *	1.53 *	1.50 *	1.47 *	1.79 *	2.07 *	1.98 *	2.17 *	2.28 *	2.32 *	2.24 *	1.82 *	2.02 *	1.50 *	0.49 *	0.1	0	0
-29	0.84 *	1.69 *	1.68 *	1.67 *	1.65 *	1.63 *	1.61 *	1.58 *	1.54 *	1.88 *	2.17 *	2.08 *	2.29 *	2.40 *	2.45 *	2.37 *	1.93 *	2.13 *	1.58 *	0.51 *	0.1	0	0
-33	0.83 *	1.66 *	1.65 *	1.64 *	1.62 *	1.60 *	1.58 *	1.56 *	1.53 *	1.86 *	2.15 *	2.07 *	2.27 *	2.39 *	2.45 *	2.38 *	1.94 *	2.15 *	1.58 *	0.50 *	0.1	0	0
-38	0.80 *	1.60 *	1.60 *	1.59 *	1.57 *	1.55 *	1.53 *	1.51 *	1.48 *	1.80 *	2.08 *	2.00 *	2.19 *	2.31 *	2.36 *	2.28 *	1.85 *	2.05 *	1.48 *	0.45 *	0.1	0	0
-43	0.69 *	1.37 *	1.37 *	1.36 *	1.35 *	1.33 *	1.31 *	1.29 *	1.26 *	1.53 *	1.77 *	1.69 *	1.84 *	1.93 *	1.97 *	1.86 *	1.49 *	1.64 *	1.15 *	0.3	0	0	0
-48	0.64 *	1.28 *	1.28 *	1.27 *	1.26 *	1.23 *	1.21 *	1.19 *	1.17 *	1.44 *	1.66 *	1.56 *	1.70 *	1.82 *	1.84 *	1.70 *	1.39 *	1.52 *	1.07 *	0.3	0	0	0
-55	0.26 *	0.53 *	0.53 *	0.53 *	0.52 *	0.51 *	0.49 *	0.49 *	0.49 *	0.61 *	0.70 *	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.6	0.2	0	0	0
-65	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0	0	0
-75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0.1	0	0	0	0	0
-85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	21.7	43.5	43.4	43.1	42.7	42.1	41.5	40.8	39.9	48.5	56.2	53.9	59.2	62.4	63.6	61.4	50.5	56.3	42	13.8	1.71	0.01	928.19

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	FFLEDXS @ 13W / 5000K	Sample ID.	F1
Temperature (°C)	25.4	Humidity (%RH)	54.0

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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 were calculated.

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
119.98	60	0.099	11.8	0.991	5.33%
277.00	60	0.050	12.7	0.926	9.93%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2021/12/26	2022/12/25
DLF108	Auxiliary Lamp	2021/12/26	2022/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2021/12/26	2022/12/25
DLF116	AC Power Source	2021/12/26	2022/12/25
DLF113	Power Meter	2021/12/26	2022/12/25
DLF112	Temperature Recorder	2021/12/26	2022/12/25
DLF114	Temperature & Humidity Datalogger	2021/12/26	2022/12/25
DLF101	Goniophotometer	2021/12/26	2022/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2021/12/26	2022/12/25
DLF104	AC Power Source	2021/12/26	2022/12/25
DLF507	DC Power Source	2021/12/26	2022/12/25
DLF102	Power Meter	2021/12/26	2022/12/25
DLF111	Temperature & Humidity Datalogger	2021/12/26	2022/12/25
DLF119	Power Meter	2021/12/26	2022/12/25
DLF031	Temperature data logger	2021/12/26	2022/12/25
DLF022	Digital power meter	2021/12/26	2022/12/25
DLF003	Temperature & Humidity Datalogger	2021/12/26	2022/12/25

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