

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

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Project Number

DLF2208102

Report Number

DLF2208102-2a

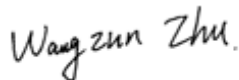
Test Date

2022/8/2

Issue Date

2022/8/3

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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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		1272
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	139.8
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		9.1
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	7.45%
		20.00%	277V	18.31%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.984
		0.9	277V	0.875
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3985±275	4029
		4 step	3985±154	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥70		83
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	-		8
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		83
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	-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		0.038
(Goniophotometer - Section 4.2)		Non-Worst Case		0.067
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		9.1
(Goniophotometer - Section 4.2)		Non-Worst Case		7.8

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2022/8/2	FFLEDXS @ 9W / 4000K	B1
2	Goniophotometer Test	2022/8/2	FFLEDXS @ 9W / 4000K	B1
3	THD and PF Test	2022/8/2	FFLEDXS @ 9W / 4000K	B1

Remark(If any)

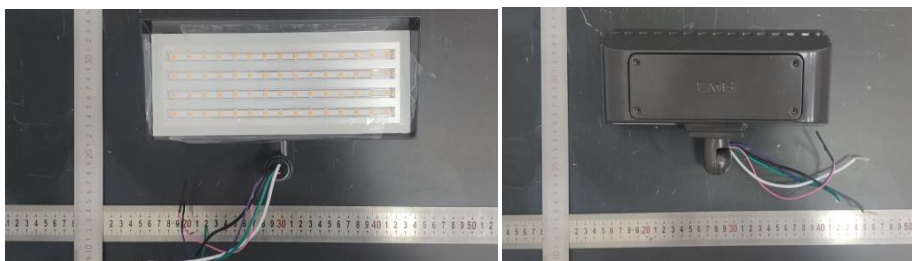
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3.0 Production Description

Luminaire Description: FFLEDXS @ 9W / 4000K

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 @ 9W / 4000K	Sample ID.	B1
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
120.05	60	0.064	7.6	0.984
276.97	60	0.037	8.9	0.875

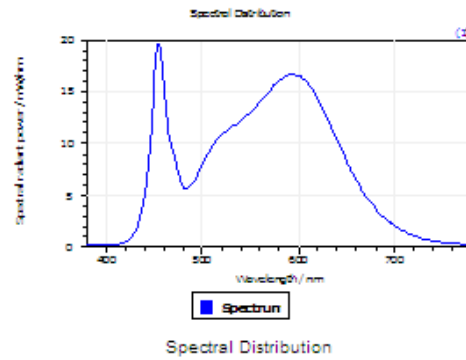
Test Result

CCT (K)	CRI	R9	Duv
4029	83	8	0.00032

Rf	Rg	IES Rcs,h1
83	93	-12%

4.1 Integrating Sphere Test

Results



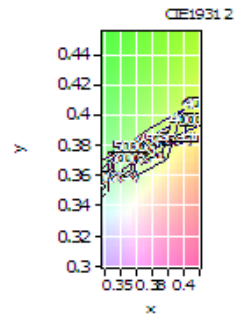
Spectral values

DominantWavelength 578.79 nm
Purity 0.289
PeakWavelength 454.67 nm
Radiant Power 2.903 W
Width50%:

Color Coordinates

Correlated Color Temperat 4029 K
x: 0.3794 u: 0.2244 u': 0.2244
y: 0.3768 v: 0.3343 v': 0.5014

CRI01	82.1	CRI09	8.3
CRI02	92.0	CRI10	80.5
CRI03	95.4	CRI11	79.1
CRI04	80.0	CRI12	61.8
CRI05	81.8	CRI13	85.1
CRI06	88.1	CRI14	98.2
CRI07	84.2	CRI15	75.4
CRI08	62.9	CRI16	71.5
ResultsCRI	83.3		



PlanckDistance 3.2E-004

4.1 Integrating Sphere Test

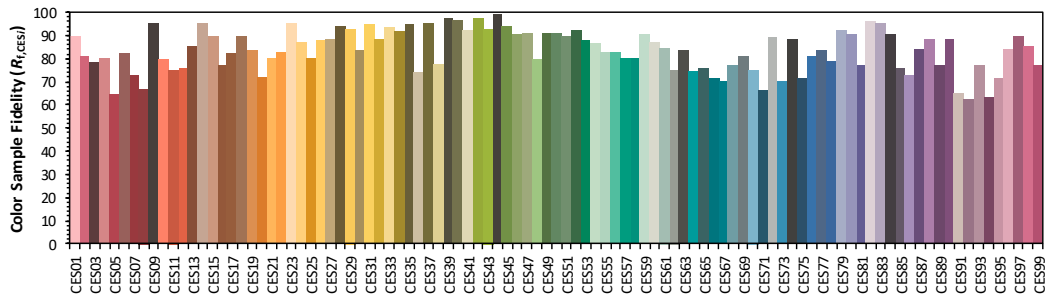
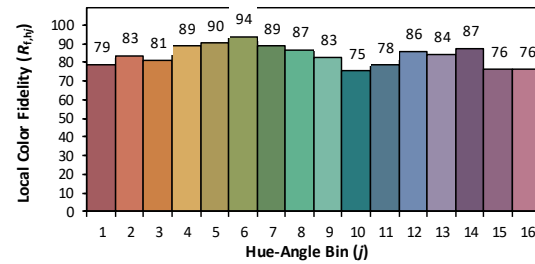
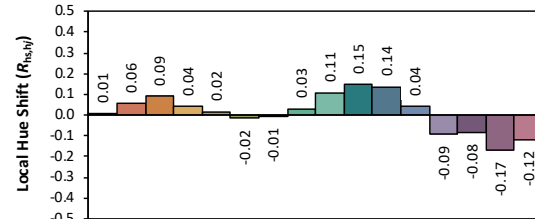
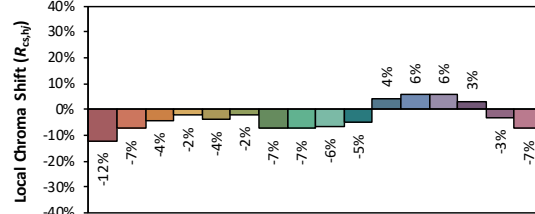
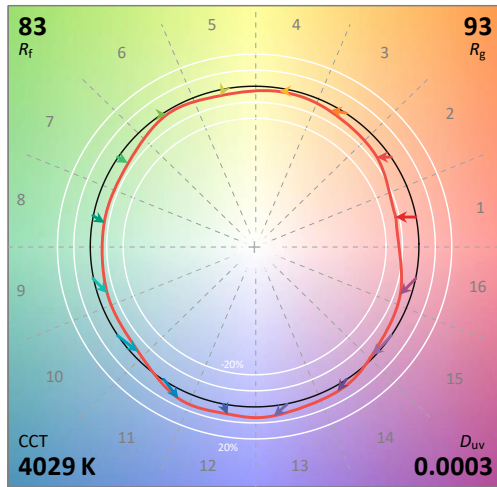
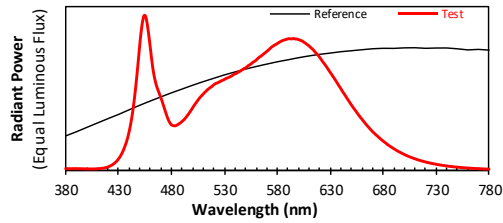
IES TM-30-18 Color Rendition Report

Source: DLF2208102-2a

Manufacturer: RAB Lighting Inc.

Date: 2022/8/2

Model: FFLEDXS @ 9W / 4000K



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

x 0.3794
 y 0.3768
 u' 0.2244
 v' 0.5014

CIE 13.3-1995
(CRI)

R_a 84
 R_g 14

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	FFLEDXS @ 9W / 4000K	Sample ID.	B1
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	276.95	60	0.038	9.1	0.867
NON-WORST CASE	120.02	60	0.067	7.8	0.976

Test Result

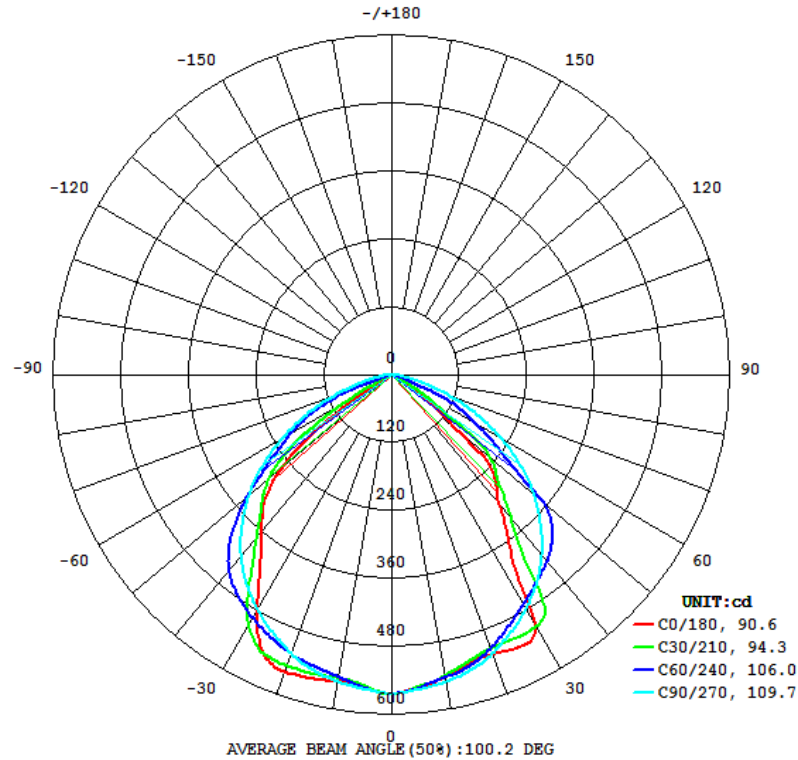
Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
1272	114.7	150.6	90.6	109.7	139.8

Zonal Lumen Requirement
(0° - 90°)

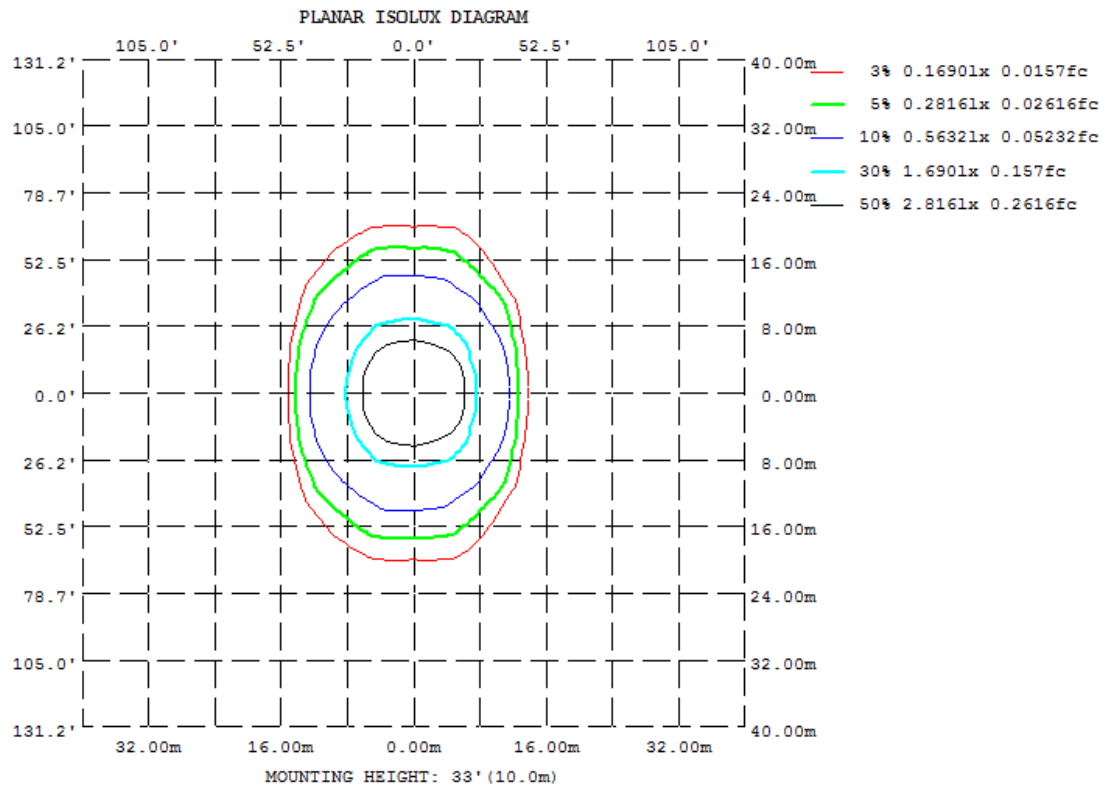
100.00%

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	541.5	542.8	550.1	541.5	550.7	541.5	550.1	542.8
20	524.4	511.4	523.6	537.7	558.2	537.7	523.6	511.4
30	511.7	488.6	477.5	514.0	478.8	514.0	477.5	488.6
40	298.7	431.8	415.7	412.2	358.0	412.2	415.7	431.8
50	145.9	247.2	331.0	293.7	257.1	293.7	331.0	247.2
60	20.87	98.41	224.3	178.4	36.95	178.4	224.3	98.41
70	0.5801	5.572	110.9	14.40	8.642	14.40	110.9	5.572
80	0.0160	0.0219	21.11	3.339	2.903	3.339	21.11	0.0219
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	52.84	0 - 10	52.84	4.15%
10-20	152.29	0 - 20	205.13	16.12%
20-30	238.19	0 - 30	443.32	34.84%
30-40	276.55	0 - 40	719.88	56.58%
40-50	262.53	0 - 50	982.40	77.22%
50-60	186.48	0 - 60	1168.88	91.87%
60-70	81.80	0 - 70	1250.68	98.30%
70-80	20.06	0 - 80	1270.74	99.88%
80-90	1.55	0 - 90	1272.29	100.00%
90-100	0.00	0 - 100	1272.29	100.00%
100-110	0.00	0 - 110	1272.29	100.00%
110-120	0.00	0 - 120	1272.29	100.00%
120-130	0.00	0 - 130	1272.29	100.00%
130-140	0.00	0 - 140	1272.29	100.00%
140-150	0.00	0 - 150	1272.29	100.00%
150-160	0.00	0 - 160	1272.29	100.00%
160-170	0.00	0 - 170	1272.29	100.00%
170-180	0.00	0 - 180	1272.29	100.00%

4.2 Goniophotometer Test

Axial Candela

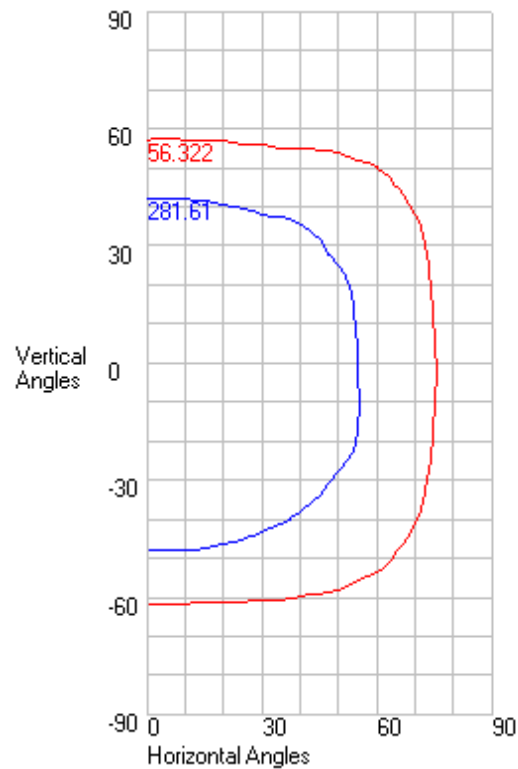
DEG.	HOR.	DEG.	VERT.
90	0	90	0
85	2.13	85	0.02
75	58.97	75	0.02
65	167.67	65	3.97
55	280.14	55	70.42
47.5	353.27	47.5	235.54
42.5	396.47	42.5	279.17
37.5	433.03	37.5	331.82
33	460.88	33	397.47
29	482.96	29	525.8
25.5	499.65	25.5	531.88
22.5	512.72	22.5	528.13
19.5	525.57	19.5	524.11
17	534.72	17	523.74
15	540.73	15	526.86
13	545.05	13	532.56
11	548.39	11	538.21
9	551.82	9	544.8
7	554.6	7	551.32
5	557.26	5	552.51
3	560.19	3	557.97
1	562.8	1	562.49
0	563.2	0	563.2
-1	562.8	-1	563.22
-3	560.19	-3	558.7
-5	557.26	-5	552.07
-7	554.6	-7	549.26
-9	551.82	-9	549.55
-11	548.39	-11	551.3
-13	545.05	-13	553.57
-15	540.73	-15	555.07
-17	534.72	-17	556.34
-19.5	525.57	-19.5	558.11
-22.5	512.72	-22.5	554.19
-25.5	499.65	-25.5	535.97
-29	482.96	-29	494.32
-33	460.88	-33	432.19
-37.5	433.03	-37.5	379.85
-42.5	396.47	-42.5	340.47
-47.5	353.27	-47.5	294.4
-55	280.14	-55	137.95
-65	167.67	-65	13.55
-75	58.97	-75	4.9
-85	2.13	-85	1.55
-90	0	-90	0

4.2 Goniophotometer Test

Characteristics

NEMA Type	7 H x 6 V
Maximum Candela	563.22
Maximum Candela Angle	0 H -1 V
Horizontal Beam Angle (50%)	109.9
Vertical Beam Angle (50%)	90.4
Horizontal Field Angle (10%)	150.9
Vertical Field Angle (10%)	118.7
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	999
Beam Efficiency	N.A.
Field Lumens	1247
Field Efficiency	N.A.
Spill Lumens	25
Luminaire Lumens	1272
Total Efficiency	N.A.
Total Luminaire Watts	9.1
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	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0
75	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.04	0.04	0.03	0.09	0.05	0.28	0.07	0.08	0
65	3.97	4.03	4.15	4.2	4.24	4.23	4.18	4.07	4.11	4.26	4.4	4.39	4.14	4.42	4.68	4.19	3.89	5.67	3.03	4.48	1.04	0.12	0
55	70.42 *	71.28 *	73.01 *	72.73 *	72.49 *	71.57 *	69.95 *	69 *	69.26 *	69.15 *	68.32 *	65.86 *	62.45 *	62.65 *	59.31 *	53.75	53.33	52.01	31.65	24.98	5.13	0.22	0
47.5	235.54 *	236 *	236.37 *	236.04 *	235.06 *	232.66 *	230.48 *	228.53 *	223.01 *	216.86 *	210.62 *	211.91 *	200.94 *	176.46 *	175.11 *	167.35 *	127.05 *	120.39 *	93.76 *	47.93	11.22	0.37	0
42.5	279.17 *	279.29 *	279.16 *	278.52 *	277.41 *	275.82 *	274.5 *	273.89 *	270.08 *	265.82 *	261.22 *	258.02 *	253.16 *	242.71 *	227.87 *	219.34 *	195.5 *	162.04 *	140.82 *	67.16 *	17.37	0.48	0
37.5	331.82 *	332.61 *	333.27 *	332.71 *	331.66 *	328.09 *	326.81 *	325.06 *	322.1 *	317.66 *	311.52 *	308.3 *	300.6 *	290.1 *	281.31 *	274.02 *	238.53 *	205.89 *	172.3 *	91.09 *	25.27	0.61	0
33	397.47 *	400.18 *	403.01 *	402.9 *	398.76 *	398.48 *	405.37 *	405.03 *	395.09 *	382.29 *	383.66 *	394.05 *	381.48 *	345 *	338.34 *	338.72 *	294.17 *	241.57 *	199.24 *	113.3 *	31.57	0.84	0
29	525.8 *	525.38 *	523.16 *	520.95 *	519.56 *	514.4 *	508 *	500.61 *	501.31 *	494.94 *	470.64 *	454.23 *	462.95 *	431.28 *	383.45 *	383.43 *	351.73 *	271.08 *	222.92 *	130.62 *	36.71	1.07	0
25.5	531.88 *	530.83 *	528.83 *	526.95 *	524.87 *	522.13 *	519.14 *	516 *	511 *	503.88 *	494.36 *	483.37 *	471.76 *	452.52 *	420.47 *	407.84 *	366.99 *	296.77 *	241.92 *	143.07 *	40.93	1.26	0
22.5	528.13 *	527.07 *	525.16 *	523.46 *	521.37 *	518.81 *	516.27 *	513.56 *	508.28 *	501.85 *	493.11 *	482.8 *	470.47 *	454.02 *	433.18 *	409.7 *	372.49 *	315.47 *	257.47 *	151.96 *	44.2	1.42	0
19.5	524.11 *	523.11 *	521.17 *	519.34 *	517.5 *	515.29 *	512.69 *	509.4 *	504.97 *	499.33 *	491.6 *	481.67 *	469.12 *	451.95 *	435.11 *	411.05 *	373.9 *	326.76 *	264.07 *	157.34 *	47.19	1.56	0
17	523.74 *	522.9 *	521.09 *	519.28 *	517.59 *	515.19 *	512.89 *	509.77 *	504.97 *	499.64 *	493.11 *	482.13 *	468.82 *	453.94 *	437.3 *	412.2 *	374.56 *	330.59 *	268.4 *	161.15 *	49.49	1.66	0
15	526.86 *	526.28 *	524.36 *	522.33 *	520.36 *	517.96 *	515.83 *	512.53 *	508.17 *	503.16 *	495.68 *	483.56 *	471.19 *	457.54 *	439.27 *	412.95 *	374.76 *	335.15 *	271.13 *	163.61 *	51.18	1.74	0
13	532.56 *	532.06 *	530.06 *	527.95 *	525.46 *	523.1 *	520.31 *	516.81 *	513.03 *	507.72 *	499.39 *	487.41 *	476.17 *	461.4 *	441.59 *	413.61 *	378.57 *	339.21 *	273.7 *	165.53 *	52.72	1.82	0
11	538.21 *	537.85 *	535.92 *	533.83 *	531.13 *	528.8 *	525.47 *	522.71 *	518.63 *	512.71 *	504.17 *	493.1 *	481.09 *	465.19 *	443.83 *	416.04 *	382.23 *	342.75 *	275.57 *	167.01 *	54.11	2.01	0
9	544.8 *	544.49 *	542.38 *	539.25 *	537.1 *	534.49 *	531.93 *	528.36 *	524.18 *	517.91 *	509.08 *	497.86 *	485.65 *	468.8 *	447.59 *	420.41 *	386.04 *	345.82 *	277.32 *	168.05 *	55.35	2.03	0
7	551.32 *	550.91 *	548.13 *	545.02 *	543.01 *	539.22 *	537.41 *	533.43 *	528.09 *	521.95 *	513.24 *	502.03 *	489.85 *	472.95 *	451.26 *	424.57 *	389.34 *	348.36 *	278.71 *	168.67 *	56.44 *	2.05	0
5	552.51 *	552.16 *	549.77 *	546.71 *	545 *	542.14 *	540.28 *	536.63 *	531.32 *	525.05 *	516.95 *	505.88 *	493.54 *	476.67 *	454.77 *	427.47 *	392.06 *	350.38 *	279.7 *	168.87 *	57.88 *	2.07	0
3	557.97 *	557.67 *	555.08 *	551.81 *	549.55 *	547.1 *	543.3 *	539.32 *	535 *	529.24 *	520.84 *	509.04 *	496.46 *	479.71 *	457.68 *	430.15 *	394.25 *	351.92 *	280.83 *	169.09 *	58.32 *	2.1	0
1	562.49 *	561.69 *	559.38 *	556.43 *	553.79 *	550.81 *	547 *	543.36 *	539.09 *	533.18 *	524.16 *	511.67 *	498.75 *	482.13 *	460.05 *	432.22 *	395.88 *	352.95 *	280.37 *	168.14 *	58.75 *	2.13	0
0	563.2 *	562.8 *	560.19 *	557.26 *	554.6 *	551.82 *	548.39 *	545.05 *	540.73 *	534.72 *	525.57 *	512.72 *	499.65 *	482.96 *	460.88 *	433.03 *	396.47 *	353.27 *	280.14 *	167.67 *	58.97 *	2.13	0
-1	563.22 *	562.64 *	560.16 *	557.43 *	554.43 *	551.11 *	547.56 *	543.93 *	539.39 *	533.44 *	524.31 *	511.61 *	498.71 *	482.47 *	460.72 *	433.22 *	397.1 *	354.21 *	281.3 *	168.13 *	58.96 *	2.13	0
-3	558.7 *	558.44 *	555.55 *	552.8 *	550.29 *	547.89 *	545.03 *	540.81 *	535.91 *	529.95 *	521.22 *	508.84 *	496.36 *	480.77 *	459.75 *	433.17 *	397.93 *	355.69 *	283.62 *	169.05 *	58.94 *	2.13	0
-5	552.07 *	551.91 *	549.56 *	546.73 *	544.69 *	541.96 *	540.5 *	537.05 *	532.76 *	526.26 *	517.37 *	505.47 *	493.44 *	478.59 *	458.32 *	432.57 *	398.22 *	356.61 *	284.31 *	168.79 *	58.92 *	2.12	0
-7	549.26 *	548.88 *	546.89 *	544.31 *	541.68 *	539.94 *	536.83 *	533.8 *	530.81 *	525.48 *	516.52 *	503.18 *	489.93 *	475.95 *	456.44 *	431.8 *	398.03 *	356.99 *	285.1 *	168.53 *	57.87 *	2.12	0
-9	549.55 *	548.75 *	547.13 *	544.48 *	542.3 *	539.75 *	537.29 *	533.96 *	529.6 *	524.88 *	516.77 *	504.61 *	490.89 *	474.09 *	454.54 *	430.05 *	397.31 *	356.79 *	285.43 *	167.82 *	57.18 *	2.12	0
-11	551.3 *	550.46 *	548.92 *	546.52 *	544.06 *	541.62 *	538.83 *	535.43 *	531.35 *	525.49 *	517.08 *	505.92 *	492.85 *	475.97 *	454.01 *	428.27 *	396.15 *	356.02 *	285.32 *	166.66 *	56.33 *	2.12	0
-13	553.57 *	552.41 *	550.51 *	548.43 *	546.51 *	544.09 *	540.73 *	537.91 *	533.48 *	527.4 *	518.46 *	506.71 *	494.28 *	477.4 *	455.84 *	428.16 *	395.14 *	354.72 *	285.01 *	165.02 *	55.32	1.95	0
-15	555.07 *	554.08 *	552.2 *	550.26 *	548.38 *	546.03 *	542.9 *	539.78 *	535.52 *	529.03 *	520.26 *	507.92 *	495.15 *	478.4 *	457.06 *	428.9 *	392.77 *	352.92 *	283.64 *	162.89 *	54.14	1.89	0
-17	556.34 *	555.32 *	553.46 *	551.64 *	549.55 *	547.25 *	544.3 *	540.73 *	536.22 *	530.53 *	521.56 *	509.18 *	495.66 *	479.09 *	457.86 *	428.33 *	390.36 *	350.7 *	281.93 *	160.24 *	52.81	1.82	0
-19.5	558.11 *	557.13 *	555.25 *	553.43 *	550.78 *	548.27 *	545.85 *	541.35 *	536.23 *	530.64 *	522.24 *	508.48 *	493.87 *	478.38 *	457.85 *	426.03 *	385.45 *	343.02 *	278.65 *	156.21 *	50.92	1.73	0
-22.5	554.19 *	553.55 *	551.94 *	550.08 *	547.12 *	544.41 *	541.98 *	538.31 *	531.46 *	524.53 *	516.17 *	503.39 *	486.7 *	469.75 *	453.44 *	420.56 *	376.72 *	331.04 *	272.97 *	150.54 *	48.46	1.61	0
-25.5	535.97 *	535.9 *	534.93 *	533.01 *	529.88 *	527.53 *	524.54 *	521.19 *	515.21 *	507.23 *	497.84 *	488.12 *	472.1 *	452.09 *	432.99 *	410.6 *	362.07 *	315.71 *	258.33 *	142.95 *	45.78	1.48	0
-29	494.32 *	495.23 *	494.93 *	493.1 *	489.65 *	487.52 *	485.17 *	481.5 *	476.61 *	469.53 *	460.83 *	452.78 *	441.05 *	421.67 *	401.54 *	382.93 *	340.33 *	294.51 *	240.82 *	133.22 *	42.24	1.3	0
-33	432.19 *	433.1 *	433.25 *	432.07 *	429.35 *	427.82 *	426 *	423.2 *	418.36 *	412.07 *	407.84 *	401.81 *	390.95 *	373.35 *	361 *	342.86 *	307.29 *	268.06 *	218.85 *	120.81 *	37.64	1.08	0
-37.5	379.85 *	380.22 *	380.28 *	379.42 *	378.18 *	375.16 *	373.61 *	371.33 *	367.87 *	363.48 *	356.6 *	351.75 *	343.72 *	330.9 *	315.93 *	300.87 *	270.24 *	235.48 *	193.06 *	103.46 *	31.87	0.85	0
-42.5	340.47 *	340.53 *	340.25 *	339.42 *	338.04 *	336.15 *	333.93 *	331.95 *	328.08 *	324.17 *	318.55 *	312.61 *	303.98 *	291.86 *	277.14 *	261.23 *	233.66 *	203.14 *	162.69 *	81.86 *	24.83	0.72	0
-47.5	294.4 *	294.82 *	295.09 *	294.65 *	293.56 *	291.59 *	288.77 *	286.03 *	282.72 *	279.11 *	274.13 *	267.75 *	258.3 *	246.38 *	233.47 *	218.56 *	188.62 *	162.08 *	127.38 *	60.36 *	17.62	0.59	0
-55	137.95 *	139.63 *	142.98 *	142.2 *	141.59 *	139.66 *	136.44 *	134.44 *	134.75 *	134.61 *	133.19 *	128.98 *	121.52 *	117.43 *	114.68 *	106.62 *	87.33 *	82.15 *	60.75 *	34.16	8.22	0.41	0
-65	13.55	13.6	13.71	13.73	13.75	13.74	13.71	13.64	13.78	13.88	13.81	13.42	13.11	13.67	14.06	12.49	12.25	15.14	9.54	11.45	3.37	0.29	0
-75	4.9	4.91	4.93	4.95	4.91	4.89	4.85	4.81	4.76	4.75	4.7	4.63	4.52	4.31	4.34	4.19	3.84	3.81	3.28	2.47	1.14	0.21	0
-85	1.55	1.55	1.54	1.54	1.53	1.53	1.52	1.51	1.5	1.49	1.46	1.44	1.41	1.38	1.33	1.25	1.15	1.06	0.89	0.69	0.44	0.08	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

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	0	0	0	0	0
65	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0	0	0
55	0.35 *	0.70 *	0.70 *	0.70 *	0.69 *	0.68 *	0.67 *	0.65 *	0.63 *	0.77 *	0.89 *	0.85 *	0.89 *	0.93 *	0.96 *	0.88 *	0.71 *	0.80 *	0.6	0.2	0	0	0
47.5	0.39 *	0.78 *	0.78 *	0.78 *	0.77 *	0.76 *	0.75 *	0.74 *	0.71 *	0.86 *	1.00 *	0.96 *	1.03 *	1.07 *	1.10 *	1.03 *	0.81 *	0.92 *	0.66 *	0.2	0	0	0
42.5	0.47 *	0.93 *	0.93 *	0.92 *	0.91 *	0.90 *	0.89 *	0.88 *	0.86 *	1.05 *	1.21 *	1.17 *	1.29 *	1.36 *	1.40 *	1.35 *	1.08 *	1.22 *	0.90 *	0.3	0	0	0
37.5	0.50 *	1.01 *	1.01 *	1.00 *	0.99 *	0.98 *	0.98 *	0.96 *	0.93 *	1.14 *	1.34 *	1.30 *	1.40 *	1.47 *	1.55 *	1.50 *	1.19 *	1.32 *	0.99 *	0.31 *	0	0	0
33	0.56 *	1.13 *	1.12 *	1.12 *	1.10 *	1.10 *	1.08 *	1.07 *	1.04 *	1.25 *	1.45 *	1.41 *	1.54 *	1.56 *	1.62 *	1.60 *	1.25 *	1.34 *	1.01 *	0.32 *	0	0	0
29	0.56 *	1.12 *	1.12 *	1.11 *	1.10 *	1.08 *	1.07 *	1.05 *	1.03 *	1.24 *	1.42 *	1.37 *	1.51 *	1.54 *	1.56 *	1.54 *	1.21 *	1.29 *	0.98 *	0.32 *	0	0	0
25.5	0.48 *	0.96 *	0.96 *	0.95 *	0.94 *	0.93 *	0.92 *	0.91 *	0.89 *	1.08 *	1.25 *	1.19 *	1.31 *	1.38 *	1.40 *	1.36 *	1.09 *	1.19 *	0.91 *	0.30 *	0	0	0
22.5	0.48 *	0.96 *	0.95 *	0.95 *	0.94 *	0.93 *	0.92 *	0.90 *	0.88 *	1.08 *	1.25 *	1.19 *	1.31 *	1.39 *	1.42 *	1.37 *	1.12 *	1.25 *	0.95 *	0.31 *	0	0	0
19.5	0.40 *	0.79 *	0.79 *	0.79 *	0.78 *	0.77 *	0.76 *	0.75 *	0.74 *	0.90 *	1.04 *	0.99 *	1.09 *	1.16 *	1.19 *	1.15 *	0.95 *	1.06 *	0.81 *	0.27 *	0	0	0
17	0.32 *	0.64 *	0.63 *	0.63 *	0.62 *	0.62 *	0.61 *	0.60 *	0.59 *	0.72 *	0.83 *	0.80 *	0.88 *	0.93 *	0.95 *	0.92 *	0.76 *	0.86 *	0.66 *	0.22 *	0	0	0
15	0.32 *	0.64 *	0.64 *	0.63 *	0.63 *	0.62 *	0.62 *	0.61 *	0.59 *	0.73 *	0.84 *	0.80 *	0.88 *	0.94 *	0.96 *	0.92 *	0.77 *	0.87 *	0.66 *	0.23 *	0	0	0
13	0.33 *	0.65 *	0.65 *	0.64 *	0.64 *	0.63 *	0.62 *	0.61 *	0.60 *	0.73 *	0.85 *	0.81 *	0.89 *	0.95 *	0.96 *	0.93 *	0.78 *	0.88 *	0.67 *	0.23 *	0	0	0
11	0.33 *	0.66 *	0.65 *	0.65 *	0.64 *	0.64 *	0.63 *	0.62 *	0.61 *	0.74 *	0.85 *	0.82 *	0.90 *	0.95 *	0.97 *	0.94 *	0.78 *	0.89 *	0.68 *	0.23 *	0	0	0
9	0.33 *	0.67 *	0.66 *	0.66 *	0.65 *	0.64 *	0.63 *	0.62 *	0.61 *	0.75 *	0.86 *	0.82 *	0.91 *	0.96 *	0.98 *	0.94 *	0.79 *	0.89 *	0.68 *	0.23 *	0	0	0
7	0.34 *	0.67 *	0.67 *	0.66 *	0.65 *	0.65 *	0.64 *	0.63 *	0.62 *	0.75 *	0.87 *	0.83 *	0.92 *	0.97 *	0.98 *	0.95 *	0.80 *	0.90 *	0.68 *	0.24 *	0	0	0
5	0.34 *	0.67 *	0.67 *	0.66 *	0.66 *	0.65 *	0.64 *	0.63 *	0.62 *	0.76 *	0.88 *	0.84 *	0.92 *	0.98 *	0.99 *	0.96 *	0.80 *	0.90 *	0.68 *	0.24 *	0	0	0
3	0.34 *	0.68 *	0.68 *	0.67 *	0.66 *	0.66 *	0.65 *	0.64 *	0.63 *	0.76 *	0.88 *	0.84 *	0.93 *	0.98 *	1.00 *	0.96 *	0.80 *	0.90 *	0.68 *	0.24 *	0	0	0
1	0.17 *	0.34 *	0.34 *	0.34 *	0.33 *	0.33 *	0.33 *	0.32 *	0.31 *	0.38 *	0.44 *	0.42 *	0.47 *	0.49 *	0.50 *	0.48 *	0.40 *	0.45 *	0.34 *	0.12 *	0	0	0
0	0.17 *	0.34 *	0.34 *	0.34 *	0.33 *	0.33 *	0.33 *	0.32 *	0.31 *	0.38 *	0.44 *	0.42 *	0.47 *	0.49 *	0.50 *	0.48 *	0.40 *	0.45 *	0.34 *	0.12 *	0	0	0

-1	0.34 *	0.68 *	0.68 *	0.67 *	0.66 *	0.66 *	0.65 *	0.64 *	0.63 *	0.76 *	0.88 *	0.84 *	0.93 *	0.98 *	1.00 *	0.97 *	0.81 *	0.91 *	0.69 *	0.24 *	0	0	0
-3	0.34 *	0.67 *	0.67 *	0.66 *	0.66 *	0.65 *	0.64 *	0.63 *	0.62 *	0.76 *	0.88 *	0.84 *	0.92 *	0.98 *	1.00 *	0.97 *	0.81 *	0.91 *	0.69 *	0.24 *	0	0	0
-5	0.34 *	0.67 *	0.66 *	0.66 *	0.65 *	0.65 *	0.64 *	0.63 *	0.62 *	0.75 *	0.87 *	0.83 *	0.92 *	0.98 *	1.00 *	0.97 *	0.81 *	0.92 *	0.69 *	0.24 *	0	0	0
-7	0.33 *	0.67 *	0.66 *	0.66 *	0.65 *	0.65 *	0.64 *	0.63 *	0.62 *	0.75 *	0.87 *	0.83 *	0.91 *	0.97 *	0.99 *	0.97 *	0.81 *	0.92 *	0.69 *	0.23 *	0	0	0
-9	0.34 *	0.67 *	0.66 *	0.66 *	0.65 *	0.65 *	0.64 *	0.63 *	0.62 *	0.75 *	0.87 *	0.83 *	0.92 *	0.97 *	0.99 *	0.96 *	0.81 *	0.92 *	0.69 *	0.23 *	0	0	0
-11	0.34 *	0.67 *	0.67 *	0.66 *	0.66 *	0.65 *	0.64 *	0.63 *	0.62 *	0.76 *	0.87 *	0.83 *	0.92 *	0.97 *	0.99 *	0.96 *	0.81 *	0.92 *	0.69 *	0.23 *	0	0	0
-13	0.34 *	0.67 *	0.67 *	0.66 *	0.66 *	0.65 *	0.64 *	0.63 *	0.62 *	0.76 *	0.88 *	0.84 *	0.92 *	0.98 *	0.99 *	0.96 *	0.81 *	0.91 *	0.68 *	0.23 *	0	0	0
-15	0.34 *	0.67 *	0.67 *	0.67 *	0.66 *	0.65 *	0.65 *	0.64 *	0.62 *	0.76 *	0.88 *	0.84 *	0.92 *	0.98 *	0.99 *	0.96 *	0.80 *	0.91 *	0.68 *	0.22 *	0	0	0
-17	0.42 *	0.85 *	0.84 *	0.84 *	0.83 *	0.82 *	0.81 *	0.80 *	0.78 *	0.95 *	1.10 *	1.05 *	1.15 *	1.22 *	1.24 *	1.19 *	0.99 *	1.12 *	0.83 *	0.27 *	0	0	0
-20	0.51 *	1.01 *	1.01 *	1.00 *	0.99 *	0.98 *	0.97 *	0.95 *	0.93 *	1.14 *	1.31 *	1.25 *	1.37 *	1.46 *	1.48 *	1.41 *	1.16 *	1.31 *	0.98 *	0.32 *	0	0	0
-23	0.50 *	0.99 *	0.99 *	0.98 *	0.97 *	0.96 *	0.95 *	0.93 *	0.91 *	1.11 *	1.28 *	1.22 *	1.34 *	1.42 *	1.44 *	1.37 *	1.12 *	1.26 *	0.94 *	0.30 *	0	0	0
-26	0.55 *	1.10 *	1.09 *	1.08 *	1.07 *	1.06 *	1.05 *	1.03 *	1.01 *	1.22 *	1.42 *	1.35 *	1.48 *	1.56 *	1.59 *	1.53 *	1.24 *	1.39 *	1.03 *	0.33 *	0	0	0
-29	0.56 *	1.13 *	1.13 *	1.12 *	1.11 *	1.10 *	1.08 *	1.06 *	1.04 *	1.27 *	1.47 *	1.41 *	1.54 *	1.63 *	1.67 *	1.60 *	1.30 *	1.46 *	1.09 *	0.35 *	0	0	0
-33	0.56 *	1.11 *	1.11 *	1.10 *	1.09 *	1.08 *	1.07 *	1.05 *	1.03 *	1.25 *	1.46 *	1.40 *	1.53 *	1.62 *	1.66 *	1.60 *	1.31 *	1.47 *	1.09 *	0.34 *	0	0	0
-38	0.55 *	1.10 *	1.09 *	1.09 *	1.08 *	1.06 *	1.05 *	1.03 *	1.01 *	1.23 *	1.43 *	1.37 *	1.50 *	1.59 *	1.62 *	1.55 *	1.27 *	1.42 *	1.03 *	0.31 *	0	0	0
-43	0.48 *	0.97 *	0.96 *	0.96 *	0.95 *	0.94 *	0.92 *	0.91 *	0.89 *	1.08 *	1.25 *	1.19 *	1.30 *	1.37 *	1.39 *	1.32 *	1.06 *	1.17 *	0.82 *	0.2	0	0	0
-48	0.50 *	1.00 *	1.00 *	0.99 *	0.98 *	0.96 *	0.94 *	0.93 *	0.91 *	1.11 *	1.29 *	1.22 *	1.32 *	1.39 *	1.41 *	1.31 *	1.05 *	1.16 *	0.81 *	0.2	0	0	0
-55	0.23 *	0.47 *	0.47 *	0.47 *	0.47 *	0.46 *	0.44 *	0.44 *	0.43 *	0.53 *	0.62 *	0.58 *	0.63 *	0.68 *	0.69 *	0.6	0.5	0.6	0.4	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	0.1	0.1	0.1	0	0	0
-75	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
-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	14.9	29.8	29.7	29.5	29.2	28.9	28.5	28	27.5	33.4	38.7	37	40.5	42.8	43.6	42	34.5	38.6	28.8	9.42	1.17	0	636.1

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	FFLEDXS @ 9W / 4000K	Sample ID.	B1
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
120.05	60	0.064	7.6	0.984	7.45%
276.97	60	0.037	8.9	0.875	18.31%

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*****