

Photometric Test Report

Relevant Standards

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

Prepared For

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2021/11/22

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2021/11/23

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		15978
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	151.2
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		105.7
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%		21.31%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9		0.858
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3045±175	3134
		4 step	3045±100	
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	≥-40		6
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		98
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-11%
Zonal Lumen Requirement (0°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	85%		99.90%
Input Voltage (V) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		480
Input Current (A) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.259

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/11/22	FFLEDL @ 120W / 3000K/480	I1
2	Goniophotometer Test	2021/11/22	FFLEDL @ 120W / 3000K/480	I1
3	THD and PF Test	2021/11/22	FFLEDL @ 120W / 3000K/480	I1

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 Production Description

Luminaire Description: FFLEDL @ 120W / 3000K/480

Electrical Specification: 480V,50/60HZ

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	FFLEDL @ 120W / 3000K/480	Sample ID.	I1
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
480.01	60	0.258	106.4	0.858

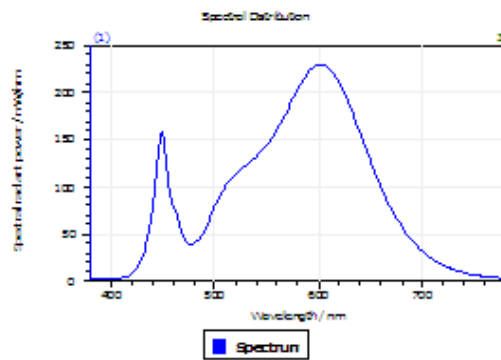
Test Result

CCT (K)	CRI	R9	Duv
3134	83	6	0.0014

Rf	Rg	IES Rcs,h1
84	98	-11%

4.1 Integrating Sphere Test

Results



Spectral values

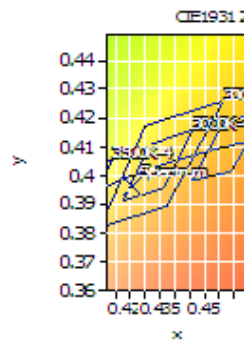
DominantWavelength	582.82 nm
Purity	0.468
PeakWavelength	601.77 nm
Radiant Power	34.7 W
Width50%:	132.30 nm

Color Coordinates

Correlated Color Temperat 3134 K

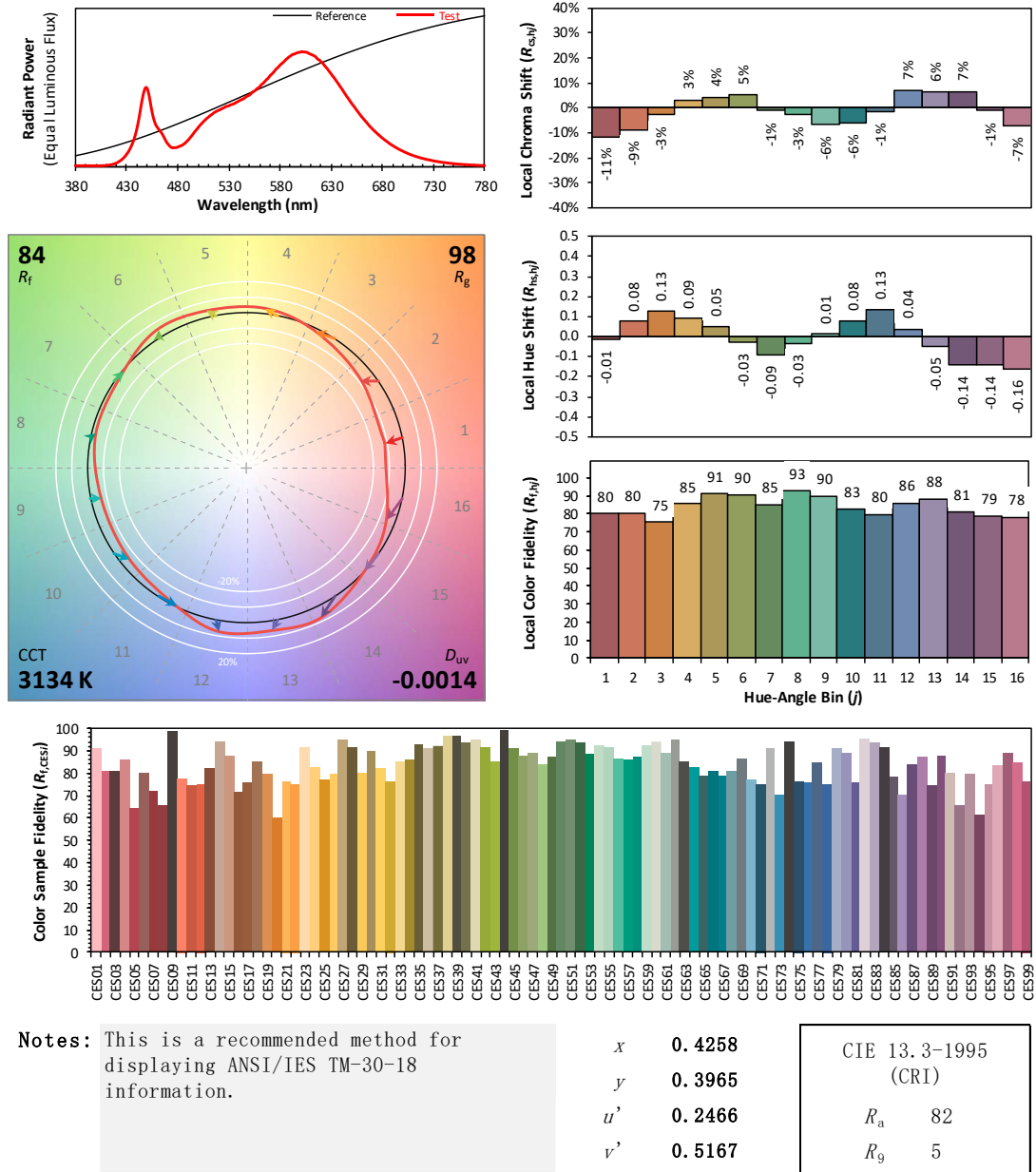
x: 0.4258 u: 0.2466 u': 0.2466
y: 0.3965 v: 0.3445 v': 0.5167

ResultsCRICRI01	81.2	ResultsCRICRI09	6.4
ResultsCRICRI02	90.2	ResultsCRICRI10	77.4
ResultsCRICRI03	96.5	ResultsCRICRI11	81.5
ResultsCRICRI04	81.6	ResultsCRICRI12	70.3
ResultsCRICRI05	81.4	ResultsCRICRI13	83.3
ResultsCRICRI06	87.3	ResultsCRICRI14	98.5
ResultsCRICRI07	83.4	ResultsCRICRI15	74.1
ResultsCRICRI08	60.1	ResultsCRICRI16	72.0
ResultsCRI	82.7		



PlanckDistance 1.4E-003

4.1 Integrating Sphere Test



Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	FFLEDL @ 120W / 3000K/480	Sample ID.	I1
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° C ± 1° 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	479.92	60	0.259	105.7	0.851

Test Result

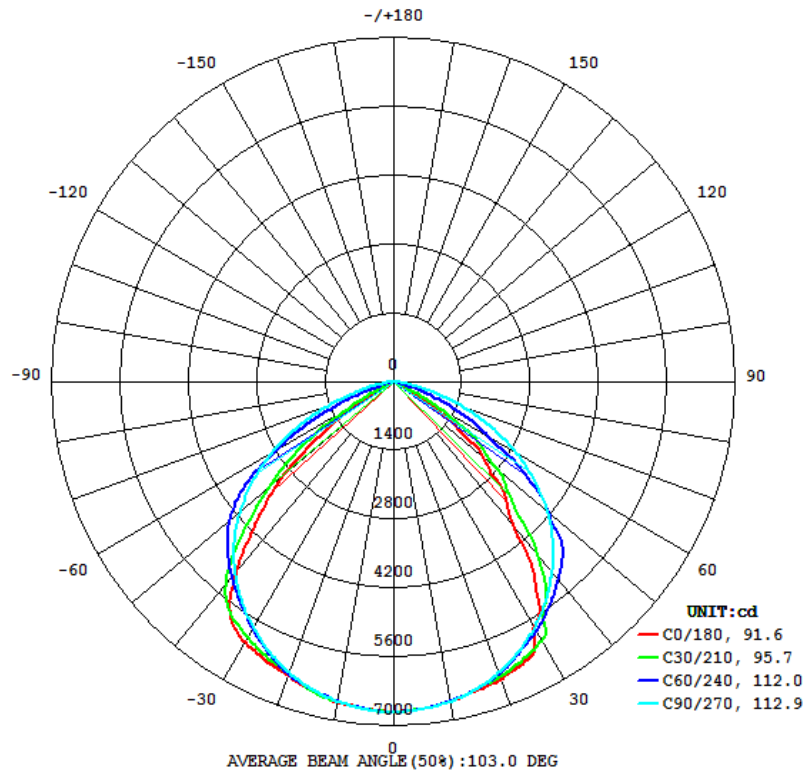
Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
15978	118.9	152.1	91.6	112.9	151.2

Zonal Lumen Requirement (0°-90°)

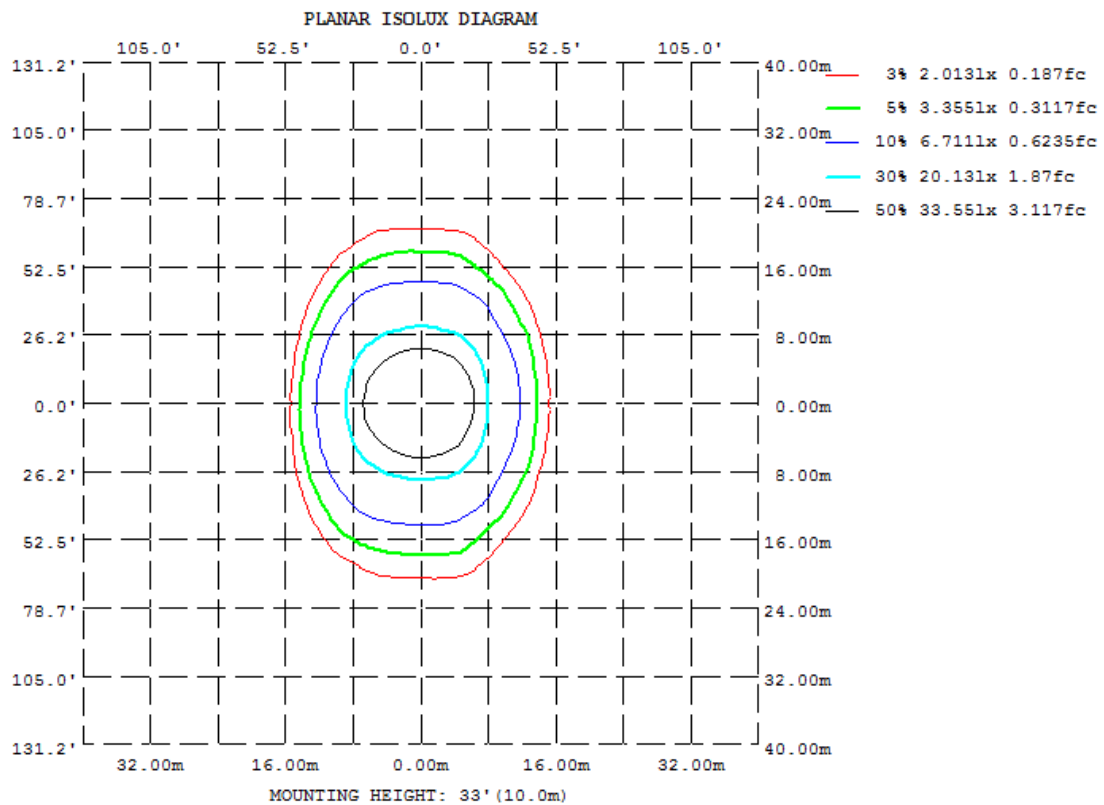
99.90%

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	6608	6601	6606	6604	6624	6603	6605	6613
20	6429	6335	6298	6345	6361	6330	6298	6328
30	5770	5963	5778	5888	6109	5885	5772	5935
40	3816	5083	5068	5382	5024	5376	5056	5050
50	2426	3131	4137	4204	2934	3997	4111	3189
60	602.5	1758	2922	2192	546.4	1945	2886	1755
70	21.24	143.7	1540	209.2	60.00	131.0	1456	193.7
80	1.366	1.249	318.7	27.93	29.58	25.96	232.7	1.422
90	0.1597	0.5335	0.5286	0.8910	0.2922	0.5147	0.5328	0.2835
100	0.4255	0.8691	0.9391	0.9261	1.386	1.761	1.474	0.9555
110	0.9875	1.307	1.629	1.281	0.9952	1.772	2.285	1.612
120	1.752	1.794	2.110	1.822	1.594	2.264	2.544	2.047
130	2.649	2.406	2.780	2.527	2.709	3.356	3.607	2.929
140	3.402	3.263	3.308	3.221	4.160	4.479	4.336	3.950
150	4.048	3.928	3.543	3.792	4.777	4.865	4.888	4.781
160	4.476	4.182	3.821	4.123	5.534	5.267	4.949	5.063
170	4.614	4.292	3.965	4.251	5.100	5.215	4.695	4.679
180	5.457	5.184	4.782	5.004	5.440	5.335	4.841	5.002
DEG	LUMINOUS INTENSITY:cd							

	Zonal (lm)		Total (lm)	Percent
0-10	636.76	0 - 10	636.76	3.99%
10-20	1838.48	0 - 20	2475.24	15.49%
20-30	2844.26	0 - 30	5319.50	33.29%
30-40	3458.12	0 - 40	8777.62	54.94%
40-50	3320.40	0 - 50	12098.03	75.72%
50-60	2449.10	0 - 60	14547.12	91.04%
60-70	1121.17	0 - 70	15668.29	98.06%
70-80	276.60	0 - 80	15944.89	99.79%
80-90	17.18	0 - 90	15962.07	99.90%
90-100	1.90	0 - 100	15963.97	99.91%
100-110	1.29	0 - 110	15965.27	99.92%
110-120	1.69	0 - 120	15966.96	99.93%
120-130	2.14	0 - 130	15969.10	99.94%
130-140	2.57	0 - 140	15971.68	99.96%
140-150	2.55	0 - 150	15974.23	99.98%
150-160	2.11	0 - 160	15976.35	99.99%
160-170	1.32	0 - 170	15977.67	100.00%
170-180	0.46	0 - 180	15978.13	100.00%

4.2 Goniophotometer Test

Axial Candela

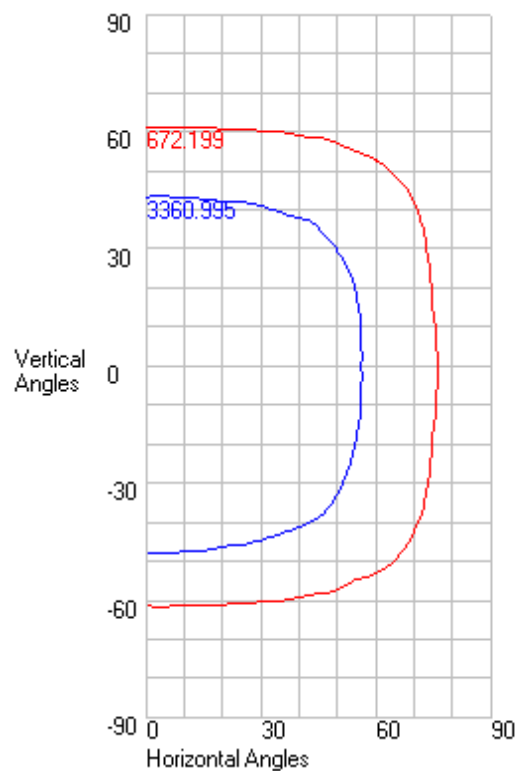
DEG.	HOR.	DEG.	VERT.
90	0.53	90	0.17
85	12.92	85	1.29
75	750.86	75	2.73
65	2174.25	65	92.61
55	3532.63	55	1499.91
47.5	4379.33	47.5	2693.52
42.5	4845.45	42.5	3483.14
37.5	5254.02	37.5	4603.23
33	5578.07	33	5517.14
29	5831.82	29	5961.84
25.5	6030.61	25.5	6294.38
22.5	6183.77	22.5	6368.05
19.5	6319.17	19.5	6439.75
17	6417.18	17	6483.8
15	6483.57	15	6505.4
13	6539.12	13	6539.58
11	6584.32	11	6590.67
9	6623.34	9	6625.96
7	6659.29	7	6651.85
5	6688.88	5	6676.12
3	6711.53	3	6694.12
1	6720.81	1	6708.44
0	6718.41	0	6718.41
-1	6718.03	-1	6709.62
-3	6704.79	-3	6698.67
-5	6685.51	-5	6677.49
-7	6656.93	-7	6653.86
-9	6623.02	-9	6632.96
-11	6586.67	-11	6609.18
-13	6540.09	-13	6564.63
-15	6484.71	-15	6507.95
-17	6415.15	-17	6443.51
-19.5	6317.86	-19.5	6373.9
-22.5	6183.9	-22.5	6309.79
-25.5	6034.53	-25.5	6235.32
-29	5836.97	-29	6138.4
-33	5584.79	-33	5986.71
-37.5	5259.83	-37.5	5502.59
-42.5	4853.78	-42.5	4470.01
-47.5	4397.53	-47.5	3455.85
-55	3556.9	-55	1735.95
-65	2232.37	-65	103.11
-75	858.97	-75	38.81
-85	41.44	-85	15.67
-90	0.53	-90	0.29

4.2 Goniophotometer Test

Characteristics

NEMA Type	7 H x 6 V
Maximum Candela	6721.99
Maximum Candela Angle	1 H 1 V
Horizontal Beam Angle (50%)	112.8
Vertical Beam Angle (50%)	91.3
Horizontal Field Angle (10%)	153.3
Vertical Field Angle (10%)	122.5
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	12725
Beam Efficiency	N.A.
Field Lumens	15762
Field Efficiency	N.A.
Spill Lumens	216
Luminaire Lumens	15978
Total Efficiency	N.A.
Total Luminaire Watts	105.662
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	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.19	0.22	0.26	0.33	0.47	0.52	0.43	0.5	0.53
85	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.28	1.28	1.27	1.26	1.25	1.23	1.19	1.15	1.09	0.98	0.75	0.47	0.5	0.53
75	2.73	2.73	2.74	2.75	2.64	2.57	2.49	2.39	2.42	2.75	2.86	2.8	2.66	2.11	3.6	3.86	2.04	4.01	3.61	5.56	0.8	0.53	0.53
65	92.61	95.87	102.39	105.18	107.5	107.83	105.89	101.38	103.64	110.08	114.42	110.2	98.9	104.27	132.17	115.67	73.69	127.76	63.71	95.47	14.88	0.62	0.53
55	1499.91 *	1508.86 *	1526.76 *	1520.63 *	1515.76 *	1503.63 *	1484.44 *	1479.2 *	1486.36 *	1469.85 *	1427.83 *	1383.14 *	1334.82 *	1326.43 *	1257.63 *	1121.08 *	1035.03 *	893.43 *	668.66	354.31	79.35	0.75	0.53
47.5	2693.52 *	2709.5 *	2732.7 *	2737.98 *	2718.02 *	2688 *	2660.76 *	2673.82 *	2692.07 *	2707.11 *	2656.13 *	2509.35 *	2455.16 *	2427.86 *	2362.68 *	2115.65 *	1946.39 *	1690.6 *	1365.96 *	731.72 *	187.23	1.01	0.53
42.5	3483.14 *	3490.29 *	3497.56 *	3494.8 *	3481.26 *	3460.39 *	3447.69 *	3444.43 *	3409.76 *	3366.67 *	3296.59 *	3275.17 *	3284.39 *	3108.07 *	2872.55 *	2850 *	2622.78 *	2189.31 *	1835.88 *	1034.87 *	263.8	1.2	0.53
37.5	4603.23 *	4619.51 *	4637.32 *	4637.63 *	4633.8 *	4586.01 *	4568.79 *	4495.41 *	4424.83 *	4401.12 *	4372.51 *	4216.67 *	4083.59 *	4019.31 *	3816.95 *	3454.78 *	3331.52 *	2899.02 *	2200.65 *	1354.91 *	341.24	1.42	0.53
33	5517.14 *	5523.1 *	5514.57 *	5498.5 *	5480.1 *	5466.02 *	5385.83 *	5327.53 *	5285.36 *	5259.65 *	5188.9 *	4993.58 *	4862.24 *	4772.75 *	4467.3 *	4236.63 *	3864.6 *	3347.22 *	2534.41 *	1592.85 *	418.66	3.29	0.53
29	5961.84 *	5987.43 *	6009.59 *	6006.07 *	5971.37 *	5911.5 *	5874.58 *	5885.84 *	5849 *	5688.79 *	5575.8 *	5541.19 *	5467.09 *	5089.9 *	4895.46 *	4662.87 *	4201.01 *	3687.17 *	2834.32 *	1755.3 *	483.48	5.11	0.53
25.5	6294.38 *	6291.42 *	6282.42 *	6269.5 *	6247.97 *	6212.38 *	6173.45 *	6130.34 *	6074.09 *	5999.82 *	5894.87 *	5753.78 *	5630.23 *	5418.77 *	5107.28 *	4885.62 *	4470.3 *	3882.22 *	3083.11 *	1886.96 *	534.78	6.59	0.53
22.5	6368.05 *	6366.08 *	6358.78 *	6347.44 *	6323.78 *	6290.58 *	6252.45 *	6205.86 *	6148.04 *	6080.82 *	5980.21 *	5850.12 *	5709.16 *	5523.36 *	5257.41 *	4962.81 *	4575.14 *	4014.63 *	3255.46 *	1988.54 *	575.15	7.76	0.53
19.5	6439.75 *	6438.78 *	6433.63 *	6423.7 *	6394.38 *	6359.97 *	6320.9 *	6272.12 *	6216.54 *	6151.51 *	6052.53 *	5914.86 *	5771.94 *	5584.54 *	5340.77 *	5029.99 *	4634.12 *	4127.82 *	3333.22 *	2045.44 *	612.23	8.84	0.53
17	6483.8 *	6483.99 *	6480.53 *	6468.76 *	6437.1 *	6403.27 *	6366.27 *	6316.82 *	6262.46 *	6202.31 *	6103.05 *	5961.42 *	5814.09 *	5637.42 *	5396.13 *	5079.65 *	4676.81 *	4202.21 *	3389.18 *	2086.92 *	640.41	9.65	0.53
15	6505.4 *	6507.3 *	6506.97 *	6493.67 *	6463.87 *	6429.63 *	6395.14 *	6347.29 *	6297.15 *	6237.28 *	6140.07 *	5992.63 *	5849.75 *	5677.01 *	5434.79 *	5113.6 *	4704.9 *	4245.16 *	3427.81 *	2114.73 *	660.9	10.25	0.53
13	6539.58 *	6545.65 *	6548.39 *	6532.58 *	6504.88 *	6473.06 *	6436.21 *	6385.54 *	6333.71 *	6275.75 *	6176.59 *	6032.41 *	5892.23 *	5713.9 *	5466.69 *	5142.75 *	4745.94 *	4282.67 *	3463.71 *	2137.77 *	679.5 *	10.8	0.53
11	6590.67 *	6597.54 *	6601.32 *	6583.57 *	6555.52 *	6520.26 *	6482.81 *	6433.66 *	6377.62 *	6314.2 *	6215.81 *	6077.91 *	5931.74 *	5746.79 *	5494.28 *	5172.24 *	4772.14 *	4314.53 *	3488.14 *	2156.15 *	696.15 *	12.28	0.53
9	6625.96 *	6633.59 *	6634.12 *	6615.51 *	6588.16 *	6555.19 *	6517.5 *	6470.83 *	6416.21 *	6350.27 *	6253.07 *	6117.03 *	5967.33 *	5773.41 *	5527.93 *	5201.94 *	4799.47 *	4340.81 *	3509.53 *	2169.87 *	710.81 *	12.4	0.53
7	6651.85 *	6663.83 *	6662.07 *	6641.66 *	6615.34 *	6581.27 *	6544.93 *	6497.68 *	6443.29 *	6377.86 *	6280.36 *	6145.93 *	5996.69 *	5798.7 *	5546.52 *	5229.56 *	4820.9 *	4360.73 *	3525.1 *	2178.92 *	723.43 *	12.51	0.53
5	6676.12 *	6689.63 *	6683.52 *	6661.98 *	6633.52 *	6600.3 *	6563.96 *	6516.81 *	6463.24 *	6397.8 *	6299.8 *	6167.4 *	6016.09 *	5817.84 *	5563.78 *	5241.95 *	4835.83 *	4373.97 *	3534.75 *	2183.33 *	740.85 *	12.63	0.53
3	6694.12 *	6710.66 *	6698.64 *	6676.74 *	6647.84 *	6612.8 *	6573.35 *	6528.91 *	6476.37 *	6411.09 *	6313.58 *	6179.14 *	6027.51 *	5829.21 *	5574.66 *	5251.83 *	4844.5 *	4380.92 *	3545.23 *	2188.22 *	744.85 *	12.74	0.53
1	6708.44 *	6721.99 *	6708.87 *	6687.5 *	6658 *	6622.49 *	6583.45 *	6538.67 *	6484.15 *	6418.29 *	6319.33 *	6184.21 *	6031.55 *	5833.8 *	5579.64 *	5255.01 *	4846.76 *	4381.48 *	3536.84 *	2178.91 *	748.85 *	12.92	0.53
0	6718.41 *	6720.81 *	6711.53 *	6688.88 *	6659.29 *	6623.34 *	6584.32 *	6539.12 *	6483.57 *	6417.18 *	6319.17 *	6183.77 *	6030.61 *	5831.82 *	5578.07 *	5254.02 *	4845.45 *	4379.33 *	3532.63 *	2174.25 *	750.86 *	12.92	0.53
-1	6709.62 *	6714.74 *	6707.85 *	6688.59 *	6657.53 *	6621.06 *	6581.66 *	6537.64 *	6482 *	6416.37 *	6317.5 *	6182.17 *	6029.83 *	5832.91 *	5580.31 *	5254.74 *	4846.55 *	4380.47 *	3536.72 *	2180.46 *	751.04 *	12.88	0.53
-3	6698.67 *	6698.31 *	6696.06 *	6672.69 *	6645.3 *	6608.86 *	6568.46 *	6524.96 *	6469.98 *	6405.15 *	6307.86 *	6172.89 *	6022.41 *	5826.73 *	5576.45 *	5250.99 *	4843.79 *	4377.92 *	3544.88 *	2192.88 *	751.38 *	12.8	0.53
-5	6677.49 *	6678.33 *	6672.94 *	6654.79 *	6627.16 *	6592.87 *	6554.31 *	6507.35 *	6455.2 *	6388.72 *	6289.55 *	6156.61 *	6007.7 *	5814.18 *	5566.17 *	5240.42 *	4834.42 *	4368.98 *	3534.35 *	2191.13 *	751.73 *	12.72	0.53
-7	6653.86 *	6654.82 *	6647.46 *	6631.13 *	6604.91 *	6572.95 *	6532.47 *	6487.82 *	6438.75 *	6374.78 *	6273.32 *	6135.15 *	5985.48 *	5794.56 *	5548.67 *	5227.19 *	4818.46 *	4353.79 *	3524.78 *	2189.86 *	737.91 *	12.64	0.53
-9	6632.96 *	6632.63 *	6626.54 *	6612.84 *	6587.32 *	6555.29 *	6515.05 *	6468.76 *	6417.8 *	6355.66 *	6252.62 *	6112.83 *	5959.08 *	5768.14 *	5529 *	5198.61 *	4795.5 *	4331.85 *	3509.54 *	2183.97 *	728.78 *	12.56	0.53
-11	6609.18 *	6609.96 *	6603.3 *	6587.91 *	6561.43 *	6526.23 *	6488.49 *	6438.75 *	6385.05 *	6322.93 *	6223.67 *	6079.63 *	5924.42 *	5734.48 *	5490.92 *	5167.79 *	4766.05 *	4303.4 *	3488.79 *	2173.44 *	717.13 *	12.48	0.53
-13	6564.63 *	6564.83 *	6556.16 *	6539.11 *	6512.34 *	6479.45 *	6440.74 *	6395.34 *	6339.79 *	6273.57 *	6178.05 *	6035.73 *	5881.73 *	5692.72 *	5452.22 *	5136.24 *	4737.35 *	4269.28 *	3465.29 *	2158.29 *	702.89 *	11.02	0.53
-15	6507.95 *	6507.93 *	6498.76 *	6481.83 *	6454.18 *	6418.63 *	6382.03 *	6338.27 *	6286.19 *	6219.3 *	6123.09 *	5986.33 *	5830.23 *	5643.42 *	5409.31 *	5104.19 *	4694.27 *	4229.86 *	3431.86 *	2138.51 *	686.04 *	10.51	0.53
-17	6443.51 *	6443.37 *	6434.85 *	6418.3 *	6391.1 *	6356 *	6319.2 *	6277.47 *	6224.73 *	6157.76 *	6065.87 *	5935.4 *	5779.4 *	5588.13 *	5362.61 *	5065.43 *	4663.04 *	4185.46 *	3396.43 *	2114.18 *	666.52	9.94	0.53
-19.5	6373.9 *	6371.33 *	6362.11 *	6347.48 *	6321.66 *	6288.9 *	6250.49 *	6211.33 *	6157.61 *	6089.78 *	5995.38 *	5874.16 *	5725.27 *	5524.99 *	5303.08 *	5010.92 *	4617.15 *	4144.54 *	3343.29 *	2077.36 *	638.33	9.16	0.53
-22.5	6309.79 *	6305.89 *	6295.42 *	6281.88 *	6257.79 *	6225.52 *	6188.32 *	6145.14 *	6086 *	6018.32 *	5925.78 *	5803.33 *	5658.93 *	5474.26 *	5227.86 *	4937.4 *	4557.01 *	4080.06 *	3265.99 *	2026.33 *	599.93	8.13	0.53
-25.5	6235.32 *	6231.59 *	6221.18 *	6206.69 *	6185.94 *	6152.92 *	6113.73 *	6069.24 *	6013.62 *	5948.13 *	5855.88 *	5731.38 *	5590.87 *	5406.59 *	5162.21 *	4854.89 *	4475.81 *	3997.92 *	3151.24 *	1955.45 *	556.72	7	0.53
-29	6138.4 *	6134.77 *	6123.18 *	6108 *	6088.61 *	6055.8 *	6016.36 *	5970.66 *	5919.67 *	5855.33 *	5762.73 *	5639.06 *	5499.56 *	5323.07 *	5048.31 *	4732.32 *	4375.08 *	3870 *	2983.92 *	1861.56 *	499.44	5.56	0.53
-33	5986.71 *	5984.04 *	5970.43 *	5951.64 *	5927.9 *	5900.33 *	5847.16 *	5798.44 *	5746.15 *	5687.7 *	5581.06 *	5437.21 *	5298.03 *	5137.94 *	4829.97 *	4473.07 *	4171.23 *	3658.48 *	2742.15 *	1729.11 *	427.77	3.78	0.53
-37.5	5502.59 *	5505.99 *	5502.43 *	5486.09 *	5465.99 *	5408.3 *	5363.75 *	5313.32 *	5260.8 *	5195.65 *	5105.97 *	4943.52 *	4794.96 *	4653.39 *	4372.01 *	4007.53 *	3708.04 *	3298.25 *	2420.59 *	1482.69 *	340.58	1.95	0.53
-42.5	4470.01 *	4478.43 *	4482.78 *	4470.32 *	4440.94 *	4395.97 *	4354.19 *	4346.88 *	4290.76 *	4235.19 *	4143.8 *	4044.43 *	3937.17 *	3795.71 *	3573.81 *	3318.23 *	3062.58 *	2676.97 *	1998.04 *	1136.05 *	251.15	1.76	0.53
-47.5	3455.85 *	3461.99 *	3464.83 *	3455.28 *	3433.6 *	3398.47 *	3349.87 *	3327.39 *	3296.91 *	3256.13 *	3189.98 *	3090.67 *	3010.85 *	2889.62 *	2721.31 *	2530.68 *	2271.11 *	1984.98 *	1501.19 *	808.56 *	157.87	1.56	0.53
-55	1735.95 *	1746.17 *	1766.6 *	1748.12 *	1731.4 *	1702.58 *	1661.85 *	1632.35 *	1618.65 *	1601.2 *	1565.26 *	1500.03 *	1415.36 *	1364.03 *	1289.09 *	1180.49 *	920.62 *	643.39	393.13	53.15	1.28	0.53	
-65	103.11	103.99	105.74	105.63	105.35	104.17	101.96	98.62	102.24	108.09	109.53	99.42	93.09	99.55	116.44	96.79	79.32	122.97	58.07	88.2	12.34	1.03	0.53
-75	38.81	38.84	38.91	38.97	38.42	38.08	37.64	37.1	36.55	36.22	35.76	35.23	34.25	32.24	32.15	31.35	27.33	26.81	22.65	13.23	3.25	0.94	0.53
-85	15.67	15.64	15.59	15.54	15.49	15.44	15.38	14.66	14.38	14	13.49	12.8	12.03	11.04	9.9	8.72	6.98	5.25	3.26	1.55	1.74	0.94	0.53
-90	0.29	0.31	0.34																				

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																								
85	0	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	0
65	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.5	0.6	0.7	0.5	0.6	0.7	0.6	0.3	0	0	0
55	2.43 *	4.92 *	4.93 *	4.90 *	4.86 *	4.78 *	4.70 *	4.65 *	4.60 *	5.58 *	6.40 *	6.05 *	6.73 *	7.25 *	7.2	6.7	5.7	6.2	4.4	1.4	0.1	0	0	0
47.5	4.80 *	9.67 *	9.68 *	9.62 *	9.50 *	9.35 *	9.25 *	9.21 *	9.13 *	11.11 *	12.65 *	11.97 *	13.39 *	14.34 *	14.26 *	13.51 *	11.18 *	12.31 *	8.81 *	2.6	0.3	0	0	0
42.5	4.71 *	9.45 *	9.45 *	9.39 *	9.29 *	9.16 *	9.08 *	9.01 *	8.88 *	10.82 *	12.46 *	11.98 *	13.29 *	13.98 *	14.21 *	13.85 *	11.34 *	12.57 *	9.30 *	2.9	0.3	0	0	0
37.5	6.17 *	12.35 *	12.34 *	12.28 *	12.15 *	11.99 *	11.82 *	11.59 *	11.36 *	13.88 *	16.04 *	15.37 *	17.03 *	17.85 *	18.05 *	17.78 *	14.69 *	16.18 *	12.15 *	3.89 *	0.4	0	0	0
33	6.94 *	13.89 *	13.86 *	13.78 *	13.65 *	13.44 *	13.19 *	12.93 *	12.72 *	15.55 *	17.86 *	16.95 *	18.84 *	19.92 *	19.92 *	19.41 *	16.16 *	17.64 *	13.22 *	4.37 *	0.5	0	0	0
29	7.00 *	14.02 *	13.98 *	13.87 *	13.73 *	13.55 *	13.37 *	13.17 *	12.89 *	15.66 *	18.15 *	17.38 *	19.10 *	20.09 *	20.40 *	19.74 *	16.23 *	17.77 *	13.34 *	4.47 *	0.5	0	0	0
25.5	6.54 *	13.08 *	13.05 *	12.96 *	12.82 *	12.68 *	12.54 *	12.36 *	12.08 *	14.65 *	17.03 *	16.36 *	17.89 *	18.78 *	19.24 *	18.62 *	15.27 *	16.93 *	12.79 *	4.29 *	0.5	0	0	0
22.5	5.78 *	11.55 *	11.51 *	11.44 *	11.35 *	11.22 *	11.07 *	10.90 *	10.69 *	13.01 *	15.05 *	14.41 *	15.87 *	16.72 *	17.06 *	16.57 *	13.70 *	15.37 *	11.71 *	3.93 *	0.5	0	0	0
19.5	5.85 *	11.69 *	11.65 *	11.58 *	11.48 *	11.35 *	11.20 *	11.02 *	10.81 *	13.18 *	15.26 *	14.59 *	16.10 *	17.06 *	17.36 *	16.88 *	14.08 *	15.92 *	12.18 *	4.12 *	0.5	0	0	0
17	4.92 *	9.83 *	9.79 *	9.73 *	9.65 *	9.54 *	9.42 *	9.27 *	9.10 *	11.09 *	12.83 *	12.27 *	13.54 *	14.37 *	14.63 *	14.22 *	11.94 *	13.55 *	10.37 *	3.55 *	0.5	0	0	0
15	3.96 *	7.90 *	7.88 *	7.83 *	7.76 *	7.68 *	7.58 *	7.46 *	7.33 *	8.93 *	10.33 *	9.88 *	10.91 *	11.59 *	11.79 *	11.46 *	9.65 *	10.99 *	8.43 *	2.91 *	0.4	0	0	0
13	3.97 *	7.94 *	7.91 *	7.86 *	7.80 *	7.72 *	7.62 *	7.50 *	7.37 *	8.98 *	10.39 *	9.94 *	10.98 *	11.66 *	11.86 *	11.52 *	9.72 *	11.09 *	8.53 *	2.96 *	0.4	0	0	0
11	4.00 *	7.99 *	7.97 *	7.92 *	7.85 *	7.77 *	7.67 *	7.54 *	7.41 *	9.03 *	10.45 *	10.00 *	11.05 *	11.72 *	11.92 *	11.59 *	9.79 *	11.17 *	8.61 *	3.01 *	0.4	0	0	0
9	4.03 *	8.05 *	8.02 *	7.97 *	7.90 *	7.82 *	7.71 *	7.59 *	7.45 *	9.09 *	10.52 *	10.06 *	11.11 *	11.78 *	11.98 *	11.65 *	9.85 *	11.24 *	8.67 *	3.05 *	0.4	0	0	0
7	4.05 *	8.09 *	8.06 *	8.01 *	7.94 *	7.85 *	7.75 *	7.63 *	7.49 *	9.13 *	10.57 *	10.11 *	11.16 *	11.83 *	12.04 *	11.71 *	9.89 *	11.30 *	8.72 *	3.08 *	0.4	0	0	0
5	4.06 *	8.12 *	8.09 *	8.04 *	7.97 *	7.88 *	7.78 *	7.66 *	7.51 *	9.16 *	10.61 *	10.15 *	11.20 *	11.87 *	12.08 *	11.75 *	9.93 *	11.33 *	8.75 *	3.11 *	0.4	0	0	0
3	4.07 *	8.14 *	8.11 *	8.06 *	7.99 *	7.90 *	7.80 *	7.68 *	7.53 *	9.19 *	10.64 *	10.18 *	11.23 *	11.90 *	12.11 *	11.78 *	9.95 *	11.36 *	8.77 *	3.13 *	0.4	0	0	0
1	4.08 *	8.16 *	8.13 *	8.07 *	8.00 *	7.91 *	7.81 *	7.69 *	7.55 *	9.20 *	10.66 *	10.19 *	11.24 *	11.92 *	12.13 *	11.79 *	9.95 *	11.36 *	8.77 *	3.13 *	0.4	0	0	0
0	2.05 *	4.09 *	4.07 *	4.04 *	4.01 *	3.96 *	3.91 *	3.85 *	3.78 *	4.60 *	5.33 *	5.10 *	5.62 *	5.96 *	6.07 *	5.89 *	4.97 *	5.67 *	4.38 *	1.57 *	0.2	0	0	0

-1	2.05 *	4.09 *	4.07 *	4.04 *	4.01 *	3.96 *	3.91 *	3.85 *	3.78 *	4.60 *	5.33 *	5.10 *	5.62 *	5.96 *	6.07 *	5.89 *	4.97 *	5.67 *	4.38 *	1.57 *	0.2	0	0
-3	4.09 *	8.17 *	8.13 *	8.08 *	8.00 *	7.92 *	7.81 *	7.69 *	7.55 *	9.20 *	10.65 *	10.19 *	11.24 *	11.92 *	12.13 *	11.79 *	9.95 *	11.35 *	8.77 *	3.14 *	0.4	0	0
-5	4.08 *	8.14 *	8.11 *	8.06 *	7.99 *	7.90 *	7.80 *	7.67 *	7.53 *	9.18 *	10.63 *	10.17 *	11.22 *	11.90 *	12.11 *	11.77 *	9.93 *	11.33 *	8.77 *	3.15 *	0.4	0	0
-7	4.06 *	8.12 *	8.09 *	8.03 *	7.96 *	7.88 *	7.77 *	7.65 *	7.51 *	9.16 *	10.60 *	10.14 *	11.18 *	11.87 *	12.08 *	11.74 *	9.91 *	11.30 *	8.74 *	3.14 *	0.4	0	0
-9	4.05 *	8.09 *	8.06 *	8.01 *	7.94 *	7.85 *	7.75 *	7.63 *	7.49 *	9.13 *	10.57 *	10.10 *	11.14 *	11.82 *	12.03 *	11.70 *	9.87 *	11.25 *	8.71 *	3.12 *	0.4	0	0
-11	4.03 *	8.06 *	8.03 *	7.98 *	7.91 *	7.83 *	7.72 *	7.60 *	7.46 *	9.10 *	10.53 *	10.05 *	11.09 *	11.76 *	11.97 *	11.63 *	9.81 *	11.19 *	8.67 *	3.10 *	0.4	0	0
-13	4.01 *	8.02 *	7.99 *	7.94 *	7.87 *	7.79 *	7.68 *	7.56 *	7.42 *	9.04 *	10.46 *	9.99 *	11.02 *	11.68 *	11.89 *	11.56 *	9.75 *	11.11 *	8.61 *	3.07 *	0.4	0	0
-15	3.98 *	7.96 *	7.93 *	7.88 *	7.81 *	7.72 *	7.62 *	7.50 *	7.36 *	8.97 *	10.38 *	9.92 *	10.93 *	11.59 *	11.81 *	11.48 *	9.67 *	11.01 *	8.53 *	3.03 *	0.4	0	0
-17	3.95 *	7.88 *	7.85 *	7.80 *	7.74 *	7.65 *	7.55 *	7.43 *	7.29 *	8.89 *	10.29 *	9.83 *	10.84 *	11.49 *	11.72 *	11.40 *	9.58 *	10.90 *	8.44 *	2.99 *	0.4	0	0
-20	4.88 *	9.75 *	9.71 *	9.66 *	9.57 *	9.46 *	9.34 *	9.20 *	9.02 *	10.99 *	12.74 *	12.18 *	13.41 *	14.22 *	14.51 *	14.12 *	11.87 *	13.47 *	10.41 *	3.67 *	0.5	0	0
-23	5.79 *	11.57 *	11.53 *	11.46 *	11.36 *	11.24 *	11.09 *	10.91 *	10.70 *	13.04 *	15.11 *	14.45 *	15.92 *	16.86 *	17.19 *	16.74 *	14.07 *	15.91 *	12.24 *	4.28 *	0.6	0	0
-26	5.73 *	11.44 *	11.40 *	11.34 *	11.24 *	11.12 *	10.97 *	10.79 *	10.58 *	12.89 *	14.93 *	14.28 *	15.74 *	16.66 *	16.94 *	16.47 *	13.84 *	15.56 *	11.91 *	4.13 *	0.5	0	0
-29	6.59 *	13.17 *	13.12 *	13.05 *	12.94 *	12.79 *	12.61 *	12.41 *	12.17 *	14.83 *	17.18 *	16.42 *	18.10 *	19.15 *	19.41 *	18.83 *	15.78 *	17.60 *	13.36 *	4.59 *	0.6	0	0
-33	7.39 *	14.75 *	14.69 *	14.60 *	14.48 *	14.31 *	14.10 *	13.87 *	13.61 *	16.58 *	19.16 *	18.29 *	20.19 *	21.31 *	21.44 *	20.77 *	17.40 *	19.14 *	14.37 *	4.89 *	0.6	0	0
-38	7.88 *	15.74 *	15.68 *	15.59 *	15.44 *	15.24 *	15.01 *	14.76 *	14.48 *	17.64 *	20.34 *	19.35 *	21.35 *	22.53 *	22.51 *	21.69 *	18.23 *	19.87 *	14.67 *	4.92 *	0.6	0	0
-43	7.60 *	15.21 *	15.18 *	15.09 *	14.93 *	14.72 *	14.52 *	14.30 *	14.02 *	17.07 *	19.69 *	18.74 *	20.67 *	21.82 *	21.82 *	20.98 *	17.64 *	19.19 *	13.93 *	4.54 *	0.5	0	0
-48	6.04 *	12.11 *	12.09 *	12.02 *	11.88 *	11.71 *	11.56 *	11.40 *	11.18 *	13.60 *	15.69 *	14.99 *	16.53 *	17.43 *	17.53 *	16.89 *	14.08 *	15.35 *	11.05 *	3.5	0.4	0	0
-55	5.94 *	11.94 *	11.95 *	11.86 *	11.72 *	11.52 *	11.31 *	11.15 *	10.96 *	13.36 *	15.40 *	14.63 *	16.09 *	16.99 *	17.15 *	16.39 *	13.54 *	14.91 *	10.73 *	3.2	0.3	0	0
-65	2.81 *	5.69 *	5.71 *	5.66 *	5.59 *	5.47 *	5.35 *	5.27 *	5.22 *	6.40 *	7.38 *	6.93 *	7.61 *	8.21 *	8.4	7.8	6.6	7.5	5.6	1.8	0.2	0	0
-75	0.2	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.7	0.6	0.7	0.9	0.9	0.8	0.9	1.1	1	0.4	0	0	0
-85	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	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	185	370	369	366	363	359	354	348	342	417	482	460	508	538	545	528	442	496	376	128	15.9	0.06	7988.83

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	FFLEDL @ 120W / 3000K/480	Sample ID.	I1
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
480.01	60	0.258	106.4	0.858	21.31%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2020/12/26	2021/12/25
DLF108	Auxiliary Lamp	2020/12/26	2021/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF116	AC Power Source	2020/12/26	2021/12/25
DLF113	Power Meter	2020/12/26	2021/12/25
DLF112	Temperature Recorder	2020/12/26	2021/12/25
DLF114	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF101	Goniophotometer	2020/12/26	2021/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF104	AC Power Source	2020/12/26	2021/12/25
DLF507	DC Power Source	2020/12/26	2021/12/25
DLF102	Power Meter	2020/12/26	2021/12/25
DLF111	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF119	Power Meter	2020/12/26	2021/12/25
DLF031	Temperature data logger	2020/12/26	2021/12/25
DLF022	Digital power meter	2020/12/26	2021/12/25
DLF003	Temperature & Humidity Datalogger	2020/12/26	2021/12/25

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