

Photometric Test Report

Relevant Standards

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

Prepared For

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Project Number

DLF2111103

Report Number

DLF2111103-3a

Test Date

2021/11/4

Issue Date

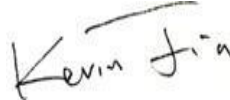
2021/11/9

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

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		26913
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	156.5
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		171.9
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%		11.22%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9		0.924
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3985±275	4126
		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	≥-40		6
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		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%		99.89%
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		0.388

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/11/4	FFLEDL @ 180W / 4000K/480	C1
2	Goniophotometer Test	2021/11/4	FFLEDL @ 180W / 4000K/480	C1
3	THD and PF Test	2021/11/4	FFLEDL @ 180W / 4000K/480	C1

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 @ 180W / 4000K/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 @ 180W / 4000K/480	Sample ID.	C1
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
480.04	60	0.383	169.8	0.924

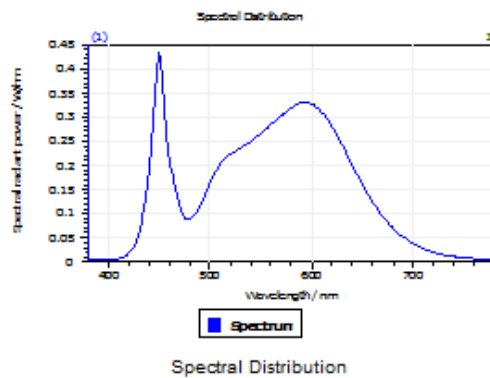
Test Result

CCT (K)	CRI	R9	Duv
4126	83	6	0.00097

Rf	Rg	IES Rcs,h1
83	96	-12%

4.1 Integrating Sphere Test

Results



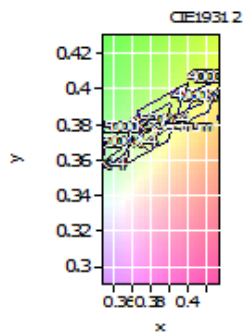
Spectral values

DominantWavelength 579.18 nm
Purity 0.237
PeakWavelength 450.07 nm
Radiant Power 58.06 W
Width50%:

1

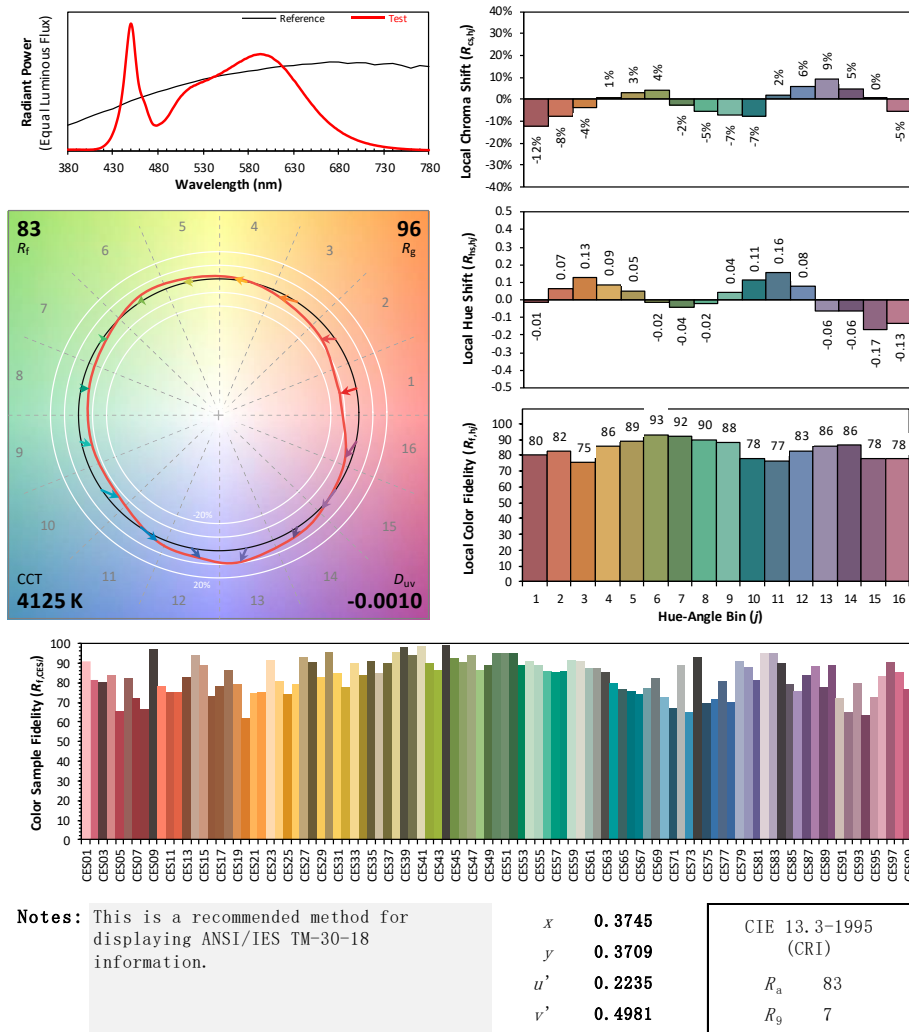
Color Coordinates

Correlated Color Temporal 4126 K
x: 0.3745 u: 0.2235 u': 0.2235
y: 0.3709 v: 0.3321 v': 0.4981
CRI01 80.9 CRI09 5.9
CRI02 88.6 CRI10 73.3
CRI03 94.2 CRI11 81.3
CRI04 82.0 CRI12 62.4
CRI05 81.5 CRI13 82.8
CRI06 84.3 CRI14 97.0
CRI07 85.2 CRI15 74.5
CRI08 63.8 CRI16 72.6
ResultsCRI 82.6



PlanckDistance 9.7E-004

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 @ 180W / 4000K/480	Sample ID.	C1
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	479.98	60	0.388	171.9	0.923

Test Result

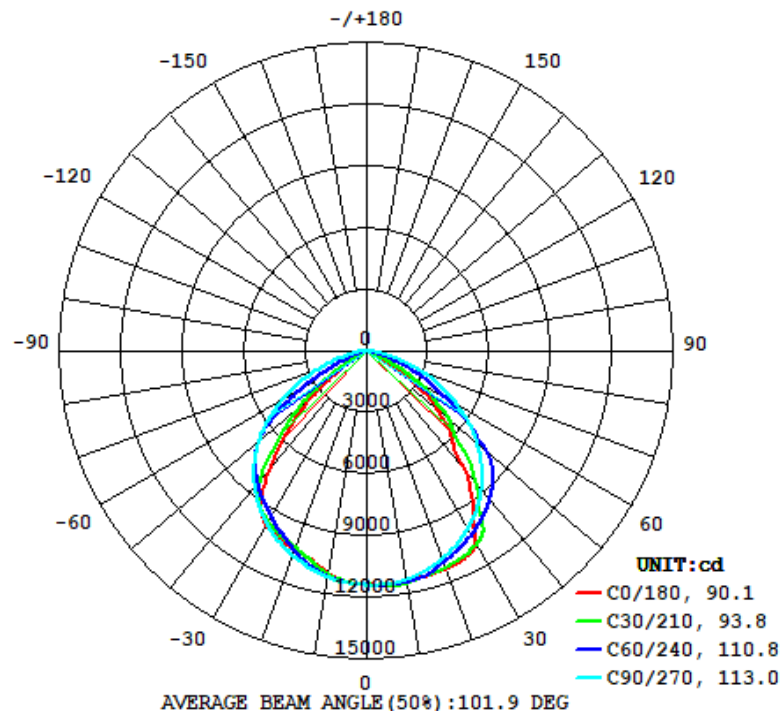
Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
26913	118.9	153.4	90.1	113.0	156.5

Zonal Lumen Requirement (0°-90°)

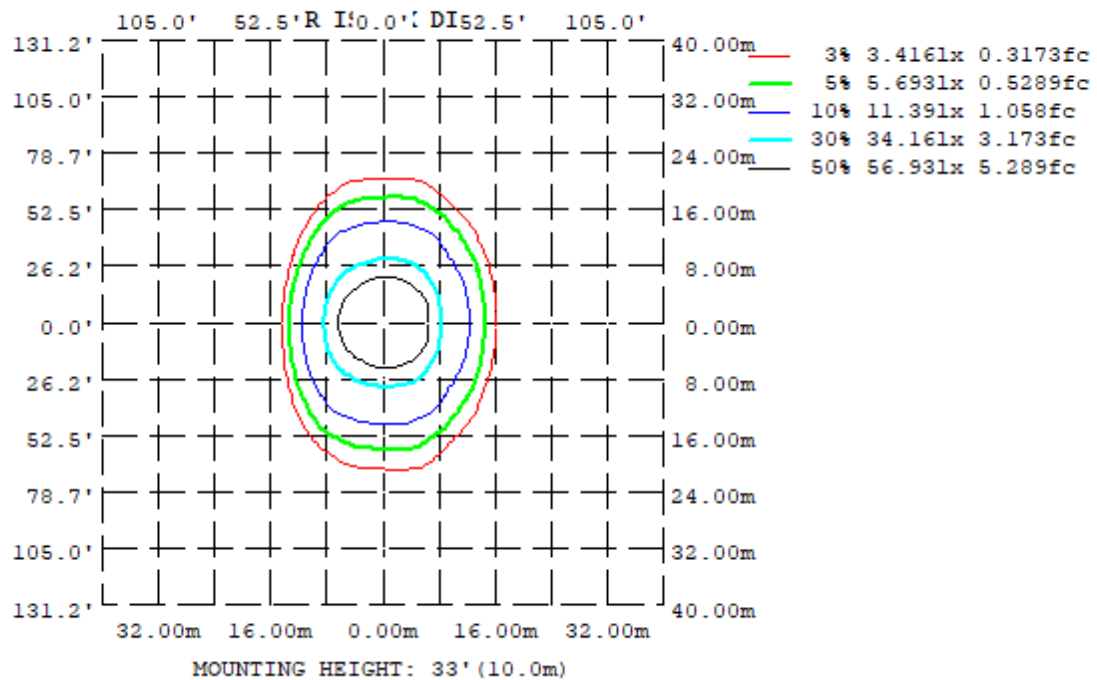
99.89%

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	1142	1149	1129	1119	1100	1111	1119	1141
20	1130	1108	1078	1034	1029	1021	1061	1094
30	1076	1062	996.8	960.1	981.3	946.5	974.6	1040
40	753.8	938.5	878.9	871.3	723.7	850.2	851.8	936.6
50	466.4	627.5	714.0	623.4	369.4	558.6	690.6	630.4
60	164.3	343.9	506.7	282.9	58.14	224.8	479.7	339.4
70	5.298	58.61	275.9	28.03	13.38	21.64	243.6	65.26
80	0.2189	0.5450	65.78	8.164	2.263	5.441	46.77	0.3166
90	0.1807	0.2196	0.1784	0.4824	0.0619	0.2502	0.1795	0.1742
100	0.0775	0.1678	0.2225	0.3087	0.4953	0.2686	0.2308	0.1112
110	0.1669	0.2614	0.4255	0.3384	0.1974	0.2830	0.3737	0.2125
120	0.3046	0.3671	0.5002	0.4654	0.3071	0.3686	0.4568	0.3023
130	0.4887	0.4861	0.6635	0.6197	0.5210	0.5059	0.6036	0.4554
140	0.6387	0.6393	0.7717	0.7681	0.7719	0.7266	0.7477	0.6625
150	0.7679	0.7862	0.8248	0.8893	0.8971	0.8523	0.8493	0.8307
160	0.8609	0.8458	0.9194	0.9246	1.005	0.9030	0.8743	0.9051
170	0.9036	0.8640	0.8806	0.8909	0.8587	0.8822	0.8009	0.8169
180	0.9993	0.9404	0.8917	0.9210	0.9827	0.9597	0.9023	0.9289
DEG	LUMINOUS INTENSITY: *10cd							

	Zonal (lm)		Total (lm)	Percent
0-10	1084.35	0 - 10	1084.35	4.03%
10-20	3110.53	0 - 20	4194.88	15.59%
20-30	4813.86	0 - 30	9008.74	33.47%
30-40	5837.13	0 - 40	14845.87	55.16%
40-50	5517.71	0 - 50	20363.58	75.66%
50-60	4039.29	0 - 60	24402.88	90.67%
60-70	1931.12	0 - 70	26333.99	97.85%
70-80	513.19	0 - 80	26847.19	99.75%
80-90	35.85	0 - 90	26883.03	99.89%
90-100	3.42	0 - 100	26886.46	99.90%
100-110	2.47	0 - 110	26888.93	99.91%
110-120	3.21	0 - 120	26892.14	99.92%
120-130	4.09	0 - 130	26896.24	99.94%
130-140	4.88	0 - 140	26901.12	99.95%
140-150	4.89	0 - 150	26906.02	99.97%
150-160	4.07	0 - 160	26910.09	99.99%
160-170	2.52	0 - 170	26912.61	100.00%
170-180	0.85	0 - 180	26913.46	100.00%

4.2 Goniophotometer Test

Axial Candela

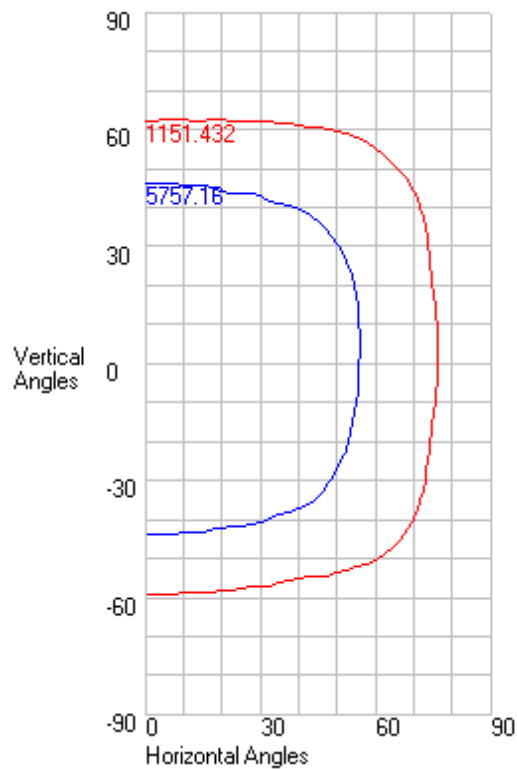
DEG.	HOR.	DEG.	VERT.
90	1.8	90	1.81
85	42.86	85	2.19
75	1329.24	75	5.89
65	3635.22	65	346.86
55	5902.89	55	3202.12
47.5	7351.46	47.5	5459.91
42.5	8154.82	42.5	6421.87
37.5	8863.63	37.5	8381.81
33	9423.01	33	9668.96
29	9849.12	29	10920.59
25.5	10175.53	25.5	11158.41
22.5	10420.05	22.5	11258.09
19.5	10643.48	19.5	11304.89
17	10806.54	17	11324.66
15	10935.88	15	11332.8
13	11047.41	13	11340.75
11	11144.39	11	11376.84
9	11226.43	9	11454.83
7	11291.05	7	11504.32
5	11338.58	5	11480.38
3	11373.33	3	11422.11
1	11394.87	1	11395.46
0	11401.19	0	11401.19
-1	11412.52	-1	11380.16
-3	11415.17	-3	11359.74
-5	11408.73	-5	11304.24
-7	11376.4	-7	11216.63
-9	11325.82	-9	11090.35
-11	11254.61	-11	10890.92
-13	11162.3	-13	10704.83
-15	11068.26	-15	10558.82
-17	10964.19	-17	10431.11
-19.5	10814.91	-19.5	10310.39
-22.5	10611.39	-22.5	10207.46
-25.5	10367.86	-25.5	10082.02
-29	10052.16	-29	9891.94
-33	9648.23	-33	9428.65
-37.5	9115.66	-37.5	8239.96
-42.5	8416.77	-42.5	6248.23
-47.5	7589.44	-47.5	4575.9
-55	6161.58	-55	1807.23
-65	3923.93	-65	208.94
-75	1642.25	-75	78.52
-85	47.25	-85	18.66
-90	1.78	-90	0.63

4.2 Goniophotometer Test

Characteristics

NEMA Type	7 H x 6 V
Maximum Candela	11514.32
Maximum Candela Angle	-3 H 7 V
Horizontal Beam Angle (50%)	112.9
Vertical Beam Angle (50%)	90.2
Horizontal Field Angle (10%)	154
Vertical Field Angle (10%)	121.7
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	21092
Beam Efficiency	N.A.
Field Lumens	26336
Field Efficiency	N.A.
Spill Lumens	576
Luminaire Lumens	26913
Total Efficiency	N.A.
Total Luminaire Watts	171.946
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	1.81	1.81	1.8	1.78	1.77	1.76	1.75	1.74	1.73	1.73	1.73	1.72	1.72	1.71	1.72	1.73	1.74	1.75	1.79	1.7	1.49	1.7	1.8
85	2.19	2.19	2.18	2.18	2.17	2.17	2.16	2.15	2.15	2.14	2.13	2.12	2.1	2.08	2.08	2.08	2.07	2.05	2.01	1.82	1.49	1.73	1.8
75	5.89	6.37	7.33	8.29	8.7	9.14	9.33	9.22	9.07	9.58	9.98	10.57	10.6	9.12	11.5	12.36	9.52	11.35	13.24	18.29	3.7	1.84	1.8
65	346.86	358.83	382.77	391.23	399.6	402.14	398.54	388.51	403.55	427.38	437.82	412.36	384.78	389.49	449.5	411.4	310.42	392.6	273.03	217.75	48.99	2.01	1.8
55	3202.12 *	3243.14 *	3325.13 *	3350.6 *	3363.63 *	3339.71 *	3272.17 *	3191.5 *	3216.02 *	3239.95 *	3250.87 *	3223.57 *	2939.88 *	2832.77 *	2753.71 *	2652.03 *	2222.84 *	1974.28 *	1528.8 *	779.1	227.3	2.19	1.8
47.5	5459.91 *	5472.07 *	5482.72 *	5480.83 *	5473.17 *	5456.92 *	5439.6 *	5389.31 *	5272.77 *	5143.02 *	5083.23 *	5053.47 *	4869.99 *	4562.1 *	4419.39 *	4261.22 *	3809.75 *	3258.29 *	2630.11 *	1461.72 *	405.79	8.14	1.8
42.5	6421.87 *	6449.07 *	6484.45 *	6483.02 *	6431.43 *	6385.62 *	6385.78 *	6479.93 *	6485.57 *	6425.39 *	6132.88 *	6011.22 *	6034.8 *	5972.12 *	5483.9 *	5153.96 *	4947.36 *	4312.44 *	3278.48 *	1974.74 *	553.82	13.25	1.8
37.5	8381.81 *	8405.33 *	8430.79 *	8426.45 *	8408.41 *	8337.18 *	8305.02 *	8257.51 *	8187.97 *	8077.05 *	7921.11 *	7747.73 *	7558.15 *	7272.41 *	6949.72 *	6595.74 *	5893.7 *	5263.07 *	3901.28 *	2532.19 *	689.82	18.75	1.8
33	9668.96 *	9688.21 *	9698.3 *	9683.46 *	9638.29 *	9624.02 *	9634.25 *	9589.25 *	9397.8 *	9225.88 *	9123.6 *	9048.23 *	8884.3 *	8344.91 *	7941.2 *	7534.01 *	7076.36 *	5931.48 *	4560.62 *	2899.94 *	809.87	22.8	1.8
29	10920.59 *	10919.81 *	10899.7 *	10872.1 *	10841.11 *	10758.28 *	10655.86 *	10524.2 *	10435.57 *	10319.26 *	10079.83 *	9761.45 *	9660.85 *	9297.67 *	8562.36 *	8188.96 *	7583.62 *	6400.93 *	5025.73 *	3113.72 *	912	26.65	1.8
25.5	11158.41 *	11151.6 *	11133.3 *	11108.73 *	11068.18 *	10987.8 *	10892.92 *	10791.78 *	10677.91 *	10545.83 *	10368.89 *	10144.49 *	9880.8 *	9515.87 *	9035.84 *	8534.99 *	7777.21 *	6789.67 *	5356.72 *	3269.11 *	1003.98	29.73	1.8
22.5	11258.09 *	11250.93 *	11233.89 *	11214.14 *	11161.38 *	11084.95 *	11000.42 *	10900.77 *	10777.81 *	10646.35 *	10479.37 *	10248.42 *	9979.43 *	9643.15 *	9201.58 *	8635.8 *	7909.11 *	7004.12 *	5605.11 *	3387.49 *	1072.9	32.16	1.8
19.5	11304.89 *	11298.41 *	11283.23 *	11264.1 *	11204.22 *	11134.99 *	11055.8 *	10947.91 *	10832.19 *	10704.41 *	10534.67 *	10306.64 *	10043.87 *	9702.38 *	9279.45 *	8715.54 *	7974.95 *	7122.3 *	5713.83 *	3473.71 *	1134.05	34.37	1.8
17	11324.66 *	11320.57 *	11310.09 *	11285.86 *	11228.74 *	11164.06 *	11076.7 *	10972.74 *	10856.91 *	10734.15 *	10564.44 *	10337.69 *	10074.15 *	9759.83 *	9338.28 *	8762.63 *	8019.26 *	7185.28 *	5790.1 *	3535.07 *	1179.74 *	36.04	1.8
15	11332.8 *	11331.07 *	11324.85 *	11295.03 *	11242.58 *	11179.89 *	11090.81 *	10988.73 *	10881.63 *	10760.33 *	10585.73 *	10350 *	10110.79 *	9808.33 *	9378.94 *	8790.56 *	8042.56 *	7246.98 *	5840.26 *	3576.05 *	1211.92 *	37.26	1.8
13	11340.75 *	11342.73 *	11343.28 *	11315.14 *	11264.86 *	11201.59 *	11115.13 *	11009.23 *	10915.12 *	10793.13 *	10610.02 *	10379.94 *	10162.21 *	9852.36 *	9411.12 *	8810.34 *	8091.6 *	7297.52 *	5885.88 *	3610.62 *	1240.19 *	38.38	1.8
11	11376.84 *	11389.17 *	11398.35 *	11368.11 *	11315.38 *	11254.03 *	11164.39 *	11068.34 *	10962.79 *	10832.29 *	10644.77 *	10429.1 *	10204.67 *	9889.53 *	9437.84 *	8836.6 *	8121.69 *	7334.68 *	5911.92 *	3636.96 *	1264.57 *	41.2	1.8
9	11454.83 *	11467.16 *	11464.83 *	11432.48 *	11381.13 *	11318.36 *	11225.53 *	11130.47 *	11015.76 *	10870.99 *	10687.94 *	10472.59 *	10241.04 *	9917.65 *	9470.31 *	8870.97 *	8152.93 *	7361.14 *	5932.74 *	3655.07 *	1285.04 *	41.5	1.8
7	11504.32 *	11508.08 *	11490.89 *	11453.08 *	11408.69 *	11331.92 *	11253.13 *	11153.07 *	11019.42 *	10881.8 *	10710.66 *	10501 *	10263.48 *	9927.32 *	9476.13 *	8899.53 *	8173.23 *	7377.18 *	5943.69 *	3664.94 *	1301.62 *	41.8	1.8
5	11480.38 *	11474.17 *	11453.67 *	11417.43 *	11367.28 *	11304.5 *	11221.81 *	11116.33 *	10994.11 *	10867.78 *	10711.2 *	10500.09 *	10254.39 *	9921.27 *	9477.35 *	8900.13 *	8182.25 *	7383.21 *	5944.67 *	3666.61 *	1326.22 *	42.1	1.8
3	11422.11 *	11431.37 *	11405.71 *	11370 *	11324.74 *	11257.27 *	11166.05 *	11075.75 *	10970.47 *	10850.86 *	10692.93 *	10476.58 *	10231.88 *	9902.25 *	9465.41 *	8894.88 *	8179.91 *	7378.67 *	5946.98 *	3669.11 *	1327.43 *	42.41	1.8
1	11395.46 *	11409.04 *	11382.1 *	11350.17 *	11302.95 *	11237.98 *	11157.43 *	11062.44 *	10953.11 *	10826.16 *	10663.09 *	10441.93 *	10197.37 *	9871.74 *	9441.97 *	8877.07 *	8166.07 *	7363.29 *	5917.6 *	3646.52 *	1328.64 *	42.86	1.8
0	11401.19 *	11394.87 *	11373.33 *	11338.58 *	11291.05 *	11226.43 *	11144.39 *	11047.41 *	10935.88 *	10806.54 *	10643.48 *	10420.05 *	10175.53 *	9849.12 *	9423.01 *	8863.63 *	8154.82 *	7351.46 *	5902.89 *	3635.22 *	1329.24 *	42.86	1.8
-1	11380.16 *	11378.85 *	11366.51 *	11333.97 *	11288.34 *	11225.19 *	11141.36 *	11041.61 *	10928.46 *	10798.93 *	10631.61 *	10406.67 *	10159.42 *	9830.91 *	9399.18 *	8836.61 *	8131.71 *	7334.6 *	5900.95 *	3639.73 *	1322.66 *	42.72	1.8
-3	11359.74 *	11353.68 *	11334.83 *	11306.73 *	11257.77 *	11197.53 *	11114.78 *	11010.2 *	10894.86 *	10767.04 *	10597.1 *	10369.87 *	10117.53 *	9779.15 *	9336.81 *	8773.59 *	8076.95 *	7292.73 *	5897.07 *	3648.75 *	1309.51 *	42.45	1.8
-5	11304.24 *	11301 *	11275.71 *	11248.26 *	11199.91 *	11138.18 *	11059.05 *	10952.09 *	10837.32 *	10714.64 *	10547.28 *	10319.56 *	10062.11 *	9714.45 *	9262.51 *	8698.25 *	8011.03 *	7240.44 *	5861.95 *	3632.66 *	1296.39 *	42.18	1.8
-7	11216.63 *	11216.55 *	11190.83 *	11158.17 *	11113.19 *	11048.03 *	10965.96 *	10869.26 *	10743.97 *	10610.32 *	10441.58 *	10231.99 *	9989.39 *	9634.38 *	9174.31 *	8617.64 *	7934.29 *	7178.26 *	5828.63 *	3617.41 *	1259.83 *	41.94	1.8
-9	11090.35 *	11091.9 *	11060.88 *	11025.89 *	10977.97 *	10913.78 *	10822.95 *	10728.28 *	10618.19 *	10475.85 *	10300.95 *	10092.89 *	9865.99 *	9534.6 *	9081.39 *	8512.07 *	7847.62 *	7108.12 *	5786.04 *	3593.98 *	1231.34 *	41.64	1.8
-11	10890.92 *	10895.1 *	10864.29 *	10845.16 *	10784.48 *	10728.36 *	10635.95 *	10551.56 *	10448.58 *	10319.01 *	10137.94 *	9939.72 *	9723.82 *	9412.5 *	8966.28 *	8402.98 *	7751.51 *	7030.87 *	5734.5 *	3562.33 *	1198.99 *	41.37	1.8
-13	10704.83 *	10705.41 *	10679.26 *	10651.24 *	10600.78 *	10548.93 *	10469.61 *	10368.01 *	10282.43 *	10168.18 *	9991.09 *	9780.86 *	9575.49 *	9285.07 *	8872.66 *	8315.11 *	7658.12 *	6946.04 *	5678.72 *	3522.45 *	1162.75 *	38.62	1.8
-15	10558.82 *	10556.37 *	10532.39 *	10502.23 *	10458.51 *	10398.22 *	10326.8 *	10233 *	10134.25 *	10024.23 *	9870.83 *	9655.53 *	9423.94 *	9156.46 *	8780.64 *	8246.57 *	7555.71 *	6852.28 *	5607.88 *	3474.36 *	1122.65 *	37.56	1.8
-17	10431.11 *	10428.19 *	10406.77 *	10374.31 *	10332.62 *	10273.1 *	10203.04 *	10117.21 *	10009.75 *	9892.54 *	9760.93 *	9563.37 *	9310.44 *	9031.44 *	8687.51 *	8174.47 *	7499.15 *	6752.37 *	5534.79 *	3418.38 *	1078.69	36.39	1.8
-19.5	10310.39 *	10303.6 *	10284.04 *	10256.61 *	10213.82 *	10154.07 *	10084.62 *	10004.72 *	9899.81 *	9781.39 *	9645.86 *	9457.62 *	9212.82 *	8908.21 *	8566.39 *	8074.16 *	7418.02 *	6671.59 *	5431.72 *	3336.17 *	1018.34	34.8	1.8
-22.5	10207.46 *	10198.89 *	10176.11 *	10146.23 *	10100.33 *	10041.28 *	9969.59 *	9882.16 *	9786.63 *	9679.83 *	9530.65 *	9325.9 *	9099.2 *	8820.43 *	8413.58 *	7939.5 *	7314.64 *	6539.06 *	5293 *	3223.33 *	941.76	32.71	1.8
-25.5	10082.02 *	10073.73 *	10052.05 *	10023.94 *	9982.52 *	9916.19 *	9841.57 *	9757.35 *	9656.26 *	9540.29 *	9388.81 *	9193.09 *	8974.27 *	8675.37 *	8267.24 *	7804.1 *	7156.88 *	6351.05 *	5031.47 *	3069.01 *	860.32	30.42	1.8
-29	9891.94 *	9884.14 *	9857.71 *	9823.68 *	9781.64 *	9710.64 *	9626.09 *	9539.02 *	9452.81 *	9339.42 *	9173.63 *	8977.65 *	8773.89 *	8456.72 *	7979.64 *	7509.64 *	6926.21 *	6030.85 *	4667.07 *	2867.52 *	755.93	27.51	1.8
-33	9428.65 *	9425.8 *	9398.24 *	9354.8 *	9294.23 *	9235.06 *	9142.28 *	9058.06 *	8967.02 *	8873.62 *	8687.25 *	8431.16 *	8225.33 *	7971.21 *	7426.03 *	6888.11 *	6458.73 *	5524.45 *	4175.98 *	2590.99 *	632.27	23.91	1.8
-37.5	8239.96 *	8244.08 *	8230.48 *	8189.71 *	8140.59 *	8011 *	7947 *	7870.47 *	7785.85 *	7674.82 *	7513.48 *	7280.52 *	7060.06 *	6866.17 *	6375.49 *	5882.08 *	5453.96 *	4734.62 *	3537.98 *	2133.8 *	490.86	20.16	1.8
-42.5	6248.23 *	6260.03 *	6263.21 *	6239.31 *	6188.65 *	6106.45 *	6034.26 *	6025.31 *	5929.61 *	5837.83 *	5698.03 *	5544.87 *	5436.03 *	5214.83 *	4860.74 *	4572.88 *	4211.94 *	3604.8 *	2745.72 *	1564.36 *	358.5	14.61	1.8
-47.5	4575.9 *	4582.48 *	4579.34 *	4553.44 *	4503.64 *	4433.01 *	4347.9 *	4326.48 *	4287.8 *	4223.2 *	4117.66 *	3964.84 *	3854.78 *	3677.23 *	3458.66 *	3192.73 *	2858.02 *	2503.88 *	1889.73 *	1085.07 *	251.67	9.4	1.8
-55	1807.23 *	1822.12 *	1851.88 *	1833.91 *	1815.76 *	1779.73 *	1724.96 *	1686.3 *	1690.9 *	1681.28 *	1641.19 *	1553.12 *	1457.61 *	1441.81 *	1372.29 *	1214.67 *	1094.96	1054.82	686.44	520.45	118.27	3.28	1.8
-65	208.94	209.68	211.16	210.87	210.52	209.43	207.54	204.8	205.31	206.86	206.78	202.18	197.61	200.78	203.57	192.95	189.79	211.78	174.31	146.01	38.48	3.08	1.8
-75	78.52	78.84	79.49	80.14	78.97	78.38	77.45	76.16	75.02	75.28	75.46	75.43	74.28	71.2	73.28								

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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0	0	0	0
65	0.6	1.1	1.2	1.2	1.2	1.2	1.1	1.1	1.2	1.5	1.8	1.6	1.8	2.1	2.4	2.1	1.9	2.4	2.1	0.8	0.1	0	0	0
55	5.44 *	11.07 *	11.21 *	11.22 *	11.14 *	10.93 *	10.64 *	10.49 *	10.51 *	13.09 *	15.26 *	14.20 *	15.30 *	16.59 *	17.25 *	16.07 *	13.05 *	15	11	3.5	0.4	0	0	0
47.5	9.92 *	19.97 *	20.04 *	19.99 *	19.84 *	19.55 *	19.16 *	18.77 *	18.43 *	22.60 *	26.41 *	24.94 *	26.90 *	28.60 *	29.50 *	28.19 *	22.76 *	25.20 *	18.47 *	5.9	0.7	0	0	0
42.5	9.06 *	18.17 *	18.16 *	18.06 *	17.89 *	17.71 *	17.58 *	17.36 *	16.96 *	20.52 *	23.78 *	22.93 *	25.42 *	26.70 *	27.08 *	26.60 *	22.05 *	24.31 *	18.11 *	6	0.7	0	0	0
37.5	11.29 *	22.63 *	22.62 *	22.49 *	22.25 *	22.02 *	21.89 *	21.67 *	21.25 *	25.70 *	29.65 *	28.58 *	31.82 *	33.49 *	33.75 *	33.00 *	27.60 *	30.34 *	22.74 *	7.74 *	0.9	0	0	0
33	12.38 *	24.80 *	24.75 *	24.62 *	24.42 *	24.20 *	23.94 *	23.51 *	22.96 *	27.97 *	32.56 *	31.21 *	34.17 *	36.01 *	36.68 *	35.57 *	29.37 *	32.07 *	24.24 *	8.41 *	1	0	0	0
29	12.55 *	25.09 *	25.02 *	24.87 *	24.68 *	24.43 *	24.08 *	23.63 *	23.13 *	28.13 *	32.58 *	31.32 *	34.43 *	35.94 *	36.54 *	35.78 *	29.30 *	31.88 *	24.30 *	8.42 *	1	0	0	0
25.5	11.77 *	23.51 *	23.43 *	23.31 *	23.10 *	22.80 *	22.44 *	22.07 *	21.65 *	26.31 *	30.34 *	29.10 *	32.13 *	33.61 *	34.11 *	33.33 *	27.33 *	30.09 *	23.05 *	7.98 *	1	0	0	0
22.5	10.24 *	20.46 *	20.40 *	20.29 *	20.11 *	19.87 *	19.59 *	19.25 *	18.87 *	23.00 *	26.65 *	25.48 *	28.08 *	29.67 *	30.20 *	29.31 *	24.23 *	27.12 *	20.83 *	7.22 *	0.9	0	0	0
19.5	10.31 *	20.59 *	20.54 *	20.42 *	20.24 *	20.01 *	19.73 *	19.40 *	19.01 *	23.18 *	26.86 *	25.69 *	28.33 *	30.05 *	30.58 *	29.64 *	24.72 *	27.95 *	21.50 *	7.50 *	1	0	0	0
17	8.62 *	17.22 *	17.17 *	17.07 *	16.93 *	16.74 *	16.50 *	16.22 *	15.91 *	19.40 *	22.48 *	21.50 *	23.74 *	25.20 *	25.65 *	24.86 *	20.84 *	23.66 *	18.24 *	6.44 *	0.9	0	0	0
15	6.90 *	13.79 *	13.76 *	13.68 *	13.56 *	13.41 *	13.22 *	13.00 *	12.75 *	15.55 *	18.02 *	17.24 *	19.06 *	20.25 *	20.60 *	19.97 *	16.78 *	19.10 *	14.77 *	5.25 *	0.7	0	0	0
13	6.91 *	13.81 *	13.77 *	13.70 *	13.58 *	13.43 *	13.24 *	13.02 *	12.78 *	15.58 *	18.05 *	17.29 *	19.14 *	20.32 *	20.65 *	20.03 *	16.86 *	19.23 *	14.89 *	5.32 *	0.7	0	0	0
11	6.92 *	13.84 *	13.81 *	13.74 *	13.62 *	13.47 *	13.28 *	13.07 *	12.82 *	15.62 *	18.10 *	17.36 *	19.21 *	20.38 *	20.70 *	20.08 *	16.94 *	19.33 *	14.98 *	5.38 *	0.8	0	0	0
9	6.96 *	13.92 *	13.88 *	13.81 *	13.69 *	13.53 *	13.34 *	13.12 *	12.87 *	15.67 *	18.17 *	17.43 *	19.27 *	20.43 *	20.75 *	20.14 *	17.00 *	19.40 *	15.03 *	5.43 *	0.8	0	0	0
7	7.00 *	13.99 *	13.95 *	13.87 *	13.75 *	13.59 *	13.40 *	13.17 *	12.90 *	15.72 *	18.24 *	17.49 *	19.31 *	20.47 *	20.81 *	20.20 *	17.04 *	19.44 *	15.07 *	5.46 *	0.8	0	0	0
5	7.00 *	13.99 *	13.95 *	13.87 *	13.75 *	13.60 *	13.40 *	13.17 *	12.91 *	15.74 *	18.27 *	17.50 *	19.32 *	20.48 *	20.83 *	20.23 *	17.06 *	19.45 *	15.07 *	5.49 *	0.8	0	0	0
3	6.98 *	13.95 *	13.90 *	13.83 *	13.71 *	13.55 *	13.36 *	13.14 *	12.89 *	15.73 *	18.25 *	17.47 *	19.29 *	20.46 *	20.82 *	20.23 *	17.05 *	19.43 *	15.06 *	5.51 *	0.8	0	0	0
1	6.95 *	13.90 *	13.86 *	13.79 *	13.67 *	13.51 *	13.32 *	13.10 *	12.86 *	15.69 *	18.19 *	17.42 *	19.24 *	20.42 *	20.79 *	20.20 *	17.02 *	19.38 *	15.01 *	5.50 *	0.8	0	0	0
0	3.47 *	6.94 *	6.92 *	6.88 *	6.82 *	6.75 *	6.65 *	6.54 *	6.41 *	7.82 *	9.07 *	8.69 *	9.59 *	10.18 *	10.37 *	10.08 *	8.49 *	9.66 *	7.47 *	2.74 *	0.4	0	0	0
0	3.47 *	6.94 *	6.92 *	6.88 *	6.82 *	6.74 *	6.64 *	6.53 *	6.41 *	7.81 *	9.06 *	8.67 *	9.57 *	10.16 *	10.35 *	10.06 *	8.47 *	9.64 *	7.46 *	2.74 *	0.4	0	0	0

-1	6.93 *	13.85 *	13.81 *	13.74 *	13.62 *	13.46 *	13.27 *	13.04 *	12.79 *	15.59 *	18.07 *	17.29 *	19.09 *	20.26 *	20.62 *	20.04 *	16.88 *	19.23 *	14.93 *	5.48 *	0.8	0	0
-3	6.91 *	13.80 *	13.76 *	13.68 *	13.56 *	13.41 *	13.22 *	12.99 *	12.73 *	15.53 *	18.00 *	17.22 *	19.00 *	20.14 *	20.48 *	19.90 *	16.77 *	19.14 *	14.89 *	5.46 *	0.8	0	0
-5	6.86 *	13.71 *	13.67 *	13.59 *	13.47 *	13.32 *	13.13 *	12.90 *	12.65 *	15.42 *	17.87 *	17.11 *	18.88 *	19.99 *	20.32 *	19.74 *	16.64 *	19.01 *	14.81 *	5.43 *	0.8	0	0
-7	6.80 *	13.58 *	13.53 *	13.46 *	13.34 *	13.18 *	12.99 *	12.77 *	12.52 *	15.25 *	17.68 *	16.94 *	18.71 *	19.82 *	20.13 *	19.54 *	16.48 *	18.86 *	14.72 *	5.38 *	0.8	0	0
-9	6.70 *	13.38 *	13.34 *	13.26 *	13.15 *	13.00 *	12.81 *	12.60 *	12.36 *	15.05 *	17.44 *	16.71 *	18.48 *	19.60 *	19.91 *	19.32 *	16.30 *	18.68 *	14.61 *	5.33 *	0.8	0	0
-11	6.58 *	13.15 *	13.11 *	13.04 *	12.93 *	12.78 *	12.60 *	12.39 *	12.17 *	14.83 *	17.17 *	16.46 *	18.22 *	19.36 *	19.68 *	19.09 *	16.11 *	18.48 *	14.48 *	5.26 *	0.7	0	0
-13	6.48 *	12.95 *	12.90 *	12.83 *	12.72 *	12.58 *	12.40 *	12.20 *	11.98 *	14.61 *	16.93 *	16.21 *	17.95 *	19.11 *	19.47 *	18.88 *	15.90 *	18.26 *	14.32 *	5.19 *	0.7	0	0
-15	6.39 *	12.78 *	12.74 *	12.66 *	12.56 *	12.42 *	12.24 *	12.04 *	11.81 *	14.42 *	16.72 *	16.00 *	17.70 *	18.86 *	19.27 *	18.70 *	15.71 *	18.00 *	14.12 *	5.10 *	0.7	0	0
-17	7.90 *	15.78 *	15.73 *	15.64 *	15.51 *	15.33 *	15.12 *	14.87 *	14.58 *	17.79 *	20.66 *	19.78 *	21.83 *	23.25 *	23.78 *	23.11 *	19.41 *	22.17 *	17.35 *	6.22 *	0.9	0	0
-20	9.37 *	18.73 *	18.67 *	18.56 *	18.39 *	18.18 *	17.93 *	17.64 *	17.30 *	21.09 *	24.47 *	23.43 *	25.87 *	27.49 *	28.07 *	27.33 *	22.95 *	26.11 *	20.31 *	7.22 *	1	0	0
-23	9.27 *	18.51 *	18.45 *	18.34 *	18.18 *	17.96 *	17.71 *	17.41 *	17.08 *	20.82 *	24.13 *	23.11 *	25.52 *	27.06 *	27.57 *	26.83 *	22.49 *	25.38 *	19.60 *	6.90 *	0.9	0	0
-26	10.65 *	21.26 *	21.18 *	21.05 *	20.86 *	20.60 *	20.30 *	19.97 *	19.58 *	23.86 *	27.63 *	26.47 *	29.22 *	30.89 *	31.35 *	30.49 *	25.46 *	28.33 *	21.68 *	7.60 *	1	0	0
-29	11.77 *	23.50 *	23.40 *	23.24 *	23.03 *	22.73 *	22.39 *	22.02 *	21.61 *	26.32 *	30.39 *	29.05 *	32.11 *	33.83 *	34.03 *	33.12 *	27.64 *	30.23 *	22.93 *	8.00 *	1	0	0
-33	12.11 *	24.21 *	24.12 *	23.95 *	23.68 *	23.35 *	23.01 *	22.62 *	22.19 *	27.03 *	31.16 *	29.68 *	32.83 *	34.60 *	34.57 *	33.51 *	28.08 *	30.47 *	22.84 *	7.90 *	0.9	0	0
-38	11.04 *	22.11 *	22.06 *	21.91 *	21.62 *	21.30 *	21.05 *	20.74 *	20.32 *	24.71 *	28.52 *	27.25 *	30.18 *	31.80 *	31.85 *	30.88 *	25.90 *	28.16 *	20.91 *	7.1	0.8	0	0
-43	8.26 *	16.55 *	16.52 *	16.40 *	16.18 *	15.91 *	15.72 *	15.53 *	15.23 *	18.52 *	21.36 *	20.45 *	22.64 *	23.83 *	24.02 *	23.33 *	19.44 *	21.26 *	15.86 *	5.4	0.6	0	0
-48	7.31 *	14.71 *	14.72 *	14.60 *	14.39 *	14.08 *	13.81 *	13.65 *	13.48 *	16.46 *	18.95 *	17.96 *	19.84 *	21.15 *	21.39 *	20.52 *	17.22 *	19.18 *	15	5.1	0.6	0	0
-55	3.1	6.3	6.3	6.3	6.2	6	5.8	5.8	5.8	7.1	8.2	7.7	8.6	9.4	9.6	9.2	8.1	9.5	7.9	3.1	0.4	0	0
-65	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	1.1	1.2	1.2	1.4	1.6	1.7	1.7	1.7	2.3	2.2	1	0.1	0	0
-75	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.5	0.7	0.6	0.2	0	0	0
-85	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0
-90																							
Total	310	620	618	615	609	602	593	584	573	698	809	774	854	904	919	892	746	837	643	227	30	0.12	13456

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	FFLEDL @ 180W / 4000K/480	Sample ID.	C1
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
480.04	60	0.383	169.8	0.924	11.22%

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*****