

# Photometric Test Report

## Relevant Standards

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

## Prepared For

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## Project Number

**DLF2111103**

## Report Number

**DLF2111103-2a**

## Test Date

**2021/11/4**

## Issue Date

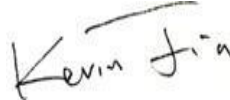
**2021/11/9**

## 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		17252
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	163.7
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		105.4
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		0.856
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029±355	5006
		4 step	5029±220	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥70		82
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥-40		1
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%		-13%
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		0.258

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/11/4	FFLEDL @ 120W / 5000K/480	B1
2	Goniophotometer Test	2021/11/4	FFLEDL @ 120W / 5000K/480	B1
3	THD and PF Test	2021/11/4	FFLEDL @ 120W / 5000K/480	B1

### 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 / 5000K/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 / 5000K/480	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  $\pm 0.2$  percent under load.

The sample was measured using  $4\pi$  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
480.03	60	0.255	104.9	0.856

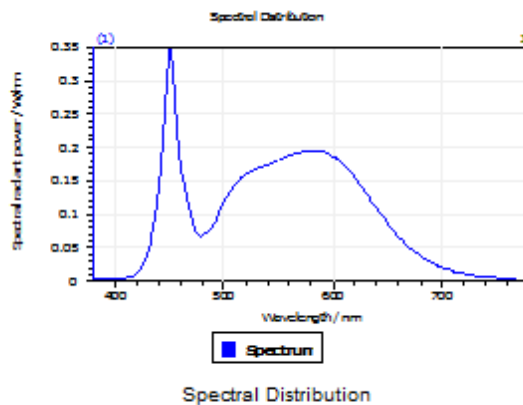
#### Test Result

CCT (K)	CRI	R9	Duv
5006	82	1	0.0027

Rf	Rg	IES Rcs,h1
83	96	-13%

## 4.1 Integrating Sphere Test

### Results



#### Spectral values

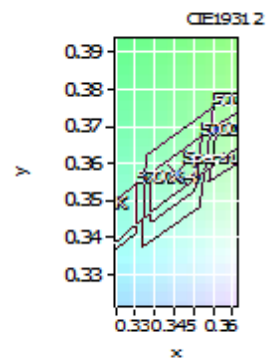
DominantWavelength 570.10 nm  
Purity 0.109  
PeakWavelength 450.71 nm  
Radiant Power 37.74 W  
Width50%:

#### Color Coordinates

Correlated Color Temperat 5006 K  
x: 0.3455 u: 0.2094 u': 0.2094  
y: 0.3574 v: 0.3250 v': 0.4875

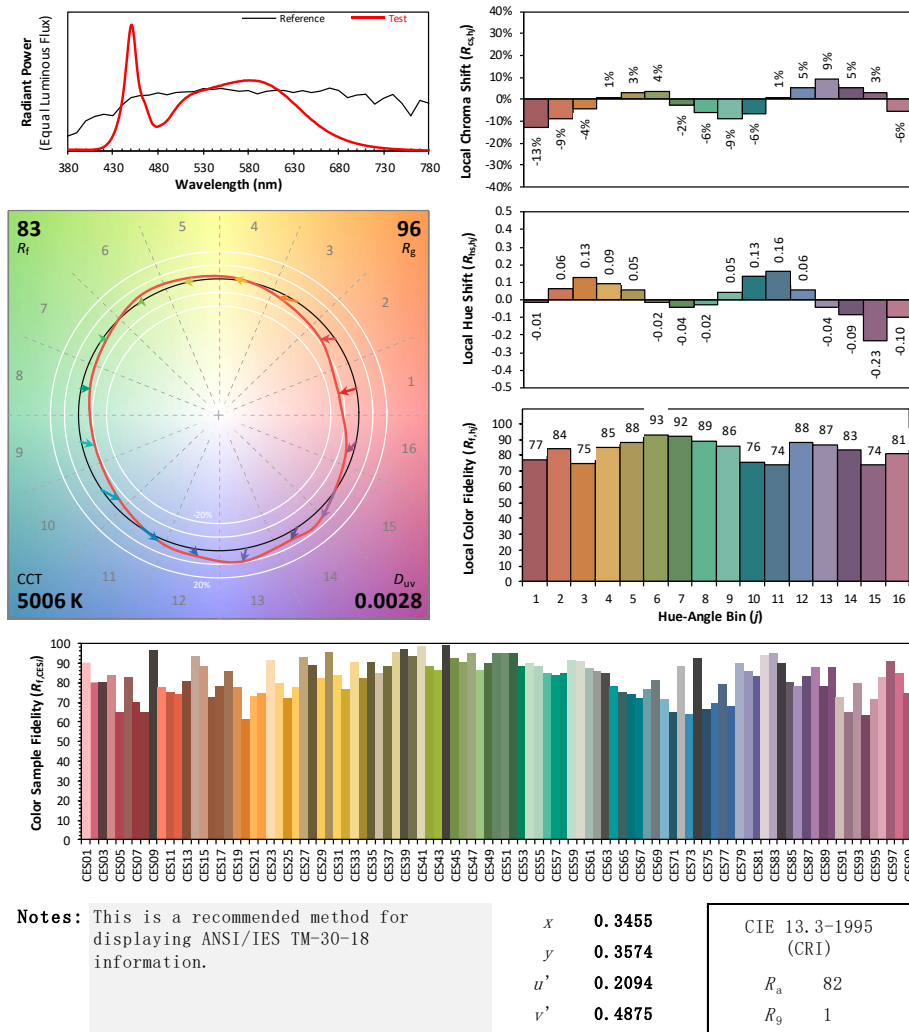
CRI01	79.6	CRI09	1.2
CRI02	86.7	CRI10	68.6
CRI03	91.7	CRI11	81.3
CRI04	81.9	CRI12	59.6
CRI05	80.7	CRI13	81.3
CRI06	81.8	CRI14	95.6
CRI07	86.0	CRI15	73.5
CRI08	65.2	CRI16	72.3

ResultsCRI 81.7



PlanckDistance 2.7E-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 / 5000K/480	Sample ID.	B1
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	479.95	60	0.258	105.4	0.851

#### Test Result

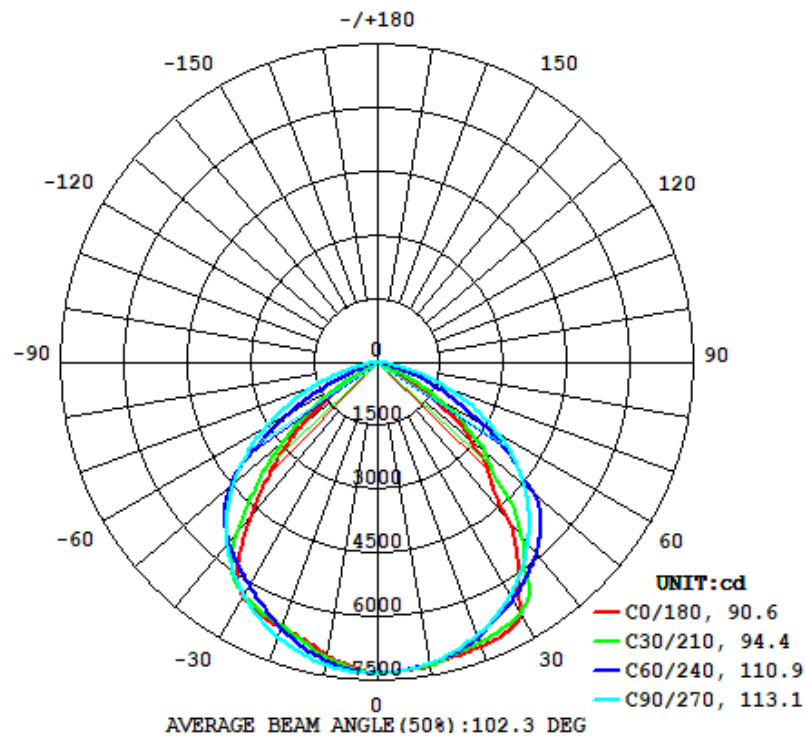
Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
17252	118.8	153.3	90.6	113.1	163.7

Zonal Lumen Requirement (0°-90°)

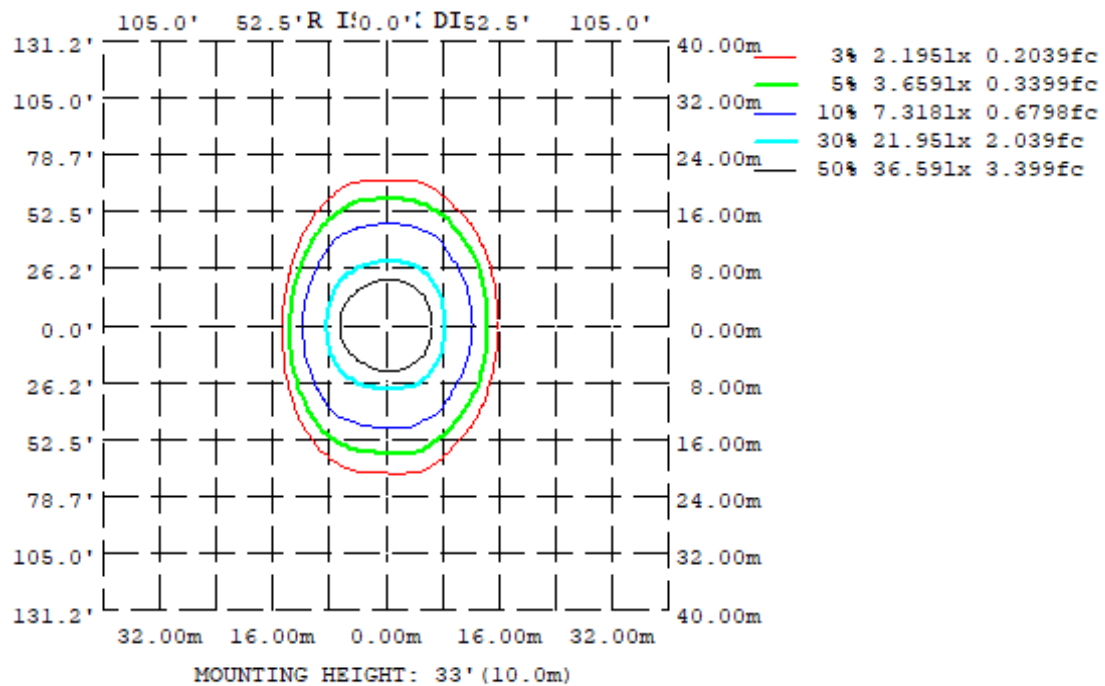
99.89%

## 4.2 Goniophotometer Test

### Light Distrubtion Curve



### Isolux Plot





## 4.2 Goniophotometer Test

### Zonal Lumen Summary

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315
10	7259	7229	7194	7080	7015	7104	7237	7268
20	7125	6939	6854	6591	6654	6604	6897	6962
30	6827	6626	6320	6187	6387	6212	6347	6630
40	4849	5862	5568	5642	4612	5597	5551	5974
50	2940	4004	4573	3973	2522	3640	4467	4074
60	884.4	2149	3263	1954	425.2	1568	3095	2142
70	34.18	301.1	1768	198.4	83.34	144.1	1578	311.3
80	1.516	5.532	425.6	52.68	13.14	33.88	294.6	2.015
90	1.270	1.524	1.182	2.698	0.4208	1.515	1.167	1.206
100	0.5294	1.100	1.440	1.920	2.579	1.731	1.524	0.7551
110	1.122	1.723	2.778	2.129	1.263	1.793	2.411	1.422
120	2.015	2.405	3.235	2.965	1.947	2.327	2.899	1.994
130	3.211	3.163	4.298	3.931	3.326	3.189	3.848	2.974
140	4.173	4.141	4.987	4.899	4.953	4.596	4.752	4.286
150	4.979	5.070	5.322	5.691	5.781	5.435	5.420	5.345
160	5.553	5.423	5.930	5.933	6.477	5.771	5.581	5.784
170	5.719	5.509	5.656	5.686	5.514	5.625	5.134	5.230
180	6.409	6.043	5.618	6.320	6.337	6.173	5.784	5.931
DEG	LUMINOUS INTENSITY:cd							

	Zonal (lm)		Total (lm)	Percent
0-10	692.30	0 - 10	692.30	4.01%
10-20	1982.79	0 - 20	2675.10	15.51%
20-30	3076.88	0 - 30	5751.98	33.34%
30-40	3739.65	0 - 40	9491.62	55.02%
40-50	3549.31	0 - 50	13040.94	75.59%
50-60	2609.30	0 - 60	15650.24	90.71%
60-70	1231.86	0 - 70	16882.10	97.85%
70-80	328.03	0 - 80	17210.12	99.75%
80-90	22.81	0 - 90	17232.94	99.89%
90-100	2.16	0 - 100	17235.10	99.90%
100-110	1.59	0 - 110	17236.69	99.91%
110-120	2.08	0 - 120	17238.77	99.92%
120-130	2.63	0 - 130	17241.41	99.94%
130-140	3.14	0 - 140	17244.55	99.95%
140-150	3.14	0 - 150	17247.69	99.97%
150-160	2.61	0 - 160	17250.31	99.99%
160-170	1.61	0 - 170	17251.92	100.00%
170-180	0.54	0 - 180	17252.46	100.00%

## 4.2 Goniophotometer Test

### Axial Candela

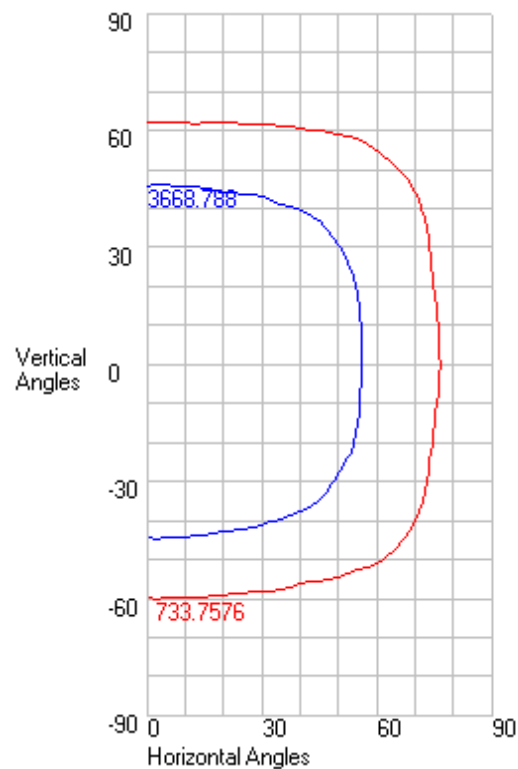
DEG.	HOR.	DEG.	VERT.
90	1.171	90	1.271
85	26.39	85	1.51
75	857.23	75	5.31
65	2334.74	65	182.23
55	3814.29	55	1946.99
47.5	4763.67	47.5	3448.675
42.5	5310.26	42.5	4104.34
37.5	5775.355	37.5	5401.99
33	6134.82	33	6141.75
29	6413.4	29	6915.31
25.5	6625.95	25.5	7061.5
22.5	6782.495	22.5	7105.28
19.5	6917.605	19.5	7129.525
17	7017.54	17	7150.04
15	7090.63	15	7162.89
13	7154.44	13	7183.68
11	7213.18	11	7230.44
9	7261.27	9	7280.21
7	7294.84	7	7290.82
5	7319.22	5	7289.67
3	7335.66	3	7296.16
1	7336.16	1	7314.34
0	7330.615	0	7330.615
-1	7324.27	-1	7308.08
-3	7309.68	-3	7266.44
-5	7287.02	-5	7201.24
-7	7255.77	-7	7138.56
-9	7218.95	-9	7062.04
-11	7169.94	-11	6956.73
-13	7111.54	-13	6855.2
-15	7046.9	-15	6781.49
-17	6973.07	-17	6715.61
-19.5	6875.56	-19.5	6662.515
-22.5	6739.855	-22.5	6627.97
-25.5	6584.83	-25.5	6555.765
-29	6378.92	-29	6442.08
-33	6118.33	-33	6092.33
-37.5	5776.605	-37.5	5213.32
-42.5	5339.885	-42.5	4079.465
-47.5	4842.345	-47.5	3066.82
-55	3956.16	-55	1316.98
-65	2521.17	-65	128.21
-75	1047.69	-75	47.41
-85	40.19	-85	10.75
-90	1.182	-90	0.427

## 4.2 Goniophotometer Test

### Characteristics

NEMA Type	7 H x 6 V
Maximum Candela	7337.576
Maximum Candela Angle	1 H 1 V
Horizontal Beam Angle (50%)	113.1
Vertical Beam Angle (50%)	90.5
Horizontal Field Angle (10%)	154.6
Vertical Field Angle (10%)	121.9
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	13495
Beam Efficiency	N.A.
Field Lumens	16907
Field Efficiency	N.A.
Spill Lumens	345
Luminaire Lumens	17252
Total Efficiency	N.A.
Total Luminaire Watts	105.376
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	1.271	1.267	1.259	1.251	1.243	1.235	1.227	1.219	1.211	1.207	1.202	1.196	1.19	1.183	1.187	1.196	1.206	1.217	1.237	1.17	1.01	1.117	1.17
85	1.51	1.509	1.506	1.503	1.501	1.498	1.495	1.492	1.488	1.482	1.475	1.466	1.457	1.446	1.442	1.44	1.436	1.423	1.386	1.244	1.011	1.14	1.17
75	5.31	5.423	5.65	5.876	5.749	5.698	5.543	5.273	5.127	5.596	5.9	6.095	5.787	4.308	6.49	7.223	4.658	7.001	7.614	11.561	1.954	1.197	1.17
65	182.23	186.14	193.959	194.681	195.735	194.59	191.28	185.847	193.224	201.482	202.763	190.447	182.694	187.439	210.785	206.129	161.712	210.228	155.688	138.3	30.209	1.277	1.17
55	1946.99 *	1968.74 *	2012.216 *	2019.718 *	2021.497 *	2002.581 *	1959.745 *	1917.213 *	1938.023 *	1958.721 *	1929.156 *	1773.955 *	1708.453 *	1669.318 *	1610.276 *	1349.651 *	1188.283 *	964.65 *	480.832	129.039	1.401	1.17	
47.5	3448.675 *	3456.609 *	3463.409 *	3461.956 *	3456.818 *	3440.219 *	3409.816 *	3366.39 *	3302.619 *	3239.212 *	3217.226 *	3204.531 *	3072.537 *	2898.754 *	2810.001 *	2700.405 *	2423.379 *	2056.713 *	1657.11 *	926.357 *	259.04	3.863	1.171
42.5	4104.34 *	4118.882 *	4136.141 *	4133.127 *	4104.632 *	4075.639 *	4075.703 *	4140.567 *	4131.107 *	4078.842 *	3910.73 *	3848.066 *	3867.148 *	3837.401 *	3497.114 *	3298.282 *	3163.938 *	2763.455 *	2083.865 *	1274.017 *	349.705	5.974	1.171
37.5	5401.99 *	5412.794 *	5421.474 *	5412.989 *	5397.564 *	5347.419 *	5323.785 *	5292.139 *	5248.694 *	5178.232 *	5088.146 *	4979.613 *	4843.458 *	4667.14 *	4484.195 *	4215.691 *	3766.357 *	3373.49 *	2478.878 *	1620.732 *	438.615	8.242	1.171
33	6141.75 *	6150.66 *	6152.351 *	6140.163 *	6111.286 *	6105.965 *	6110.49 *	6069.782 *	5957.619 *	5861.845 *	5819.079 *	5780.064 *	5650.229 *	5329.472 *	5098.925 *	4842.726 *	4497.298 *	3792.57 *	2898.362 *	1851.895 *	515.111	11.152	1.171
29	6915.31 *	6916.884 *	6908.714 *	6894.11 *	6873.981 *	6823.917 *	6764.131 *	6681.555 *	6641.684 *	6572.188 *	6403.863 *	6222.893 *	6176.99 *	5934.483 *	5479.816 *	5259.533 *	4851.174 *	4082.558 *	3204.283 *	1987.912 *	579.983	13.973	1.171
25.5	7061.5 *	7059.615 *	7053.402 *	7044.866 *	7023.482 *	6975.501 *	6924.857 *	6870.752 *	6803.811 *	6722.127 *	6613.838 *	6480.176 *	6314.338 *	6080.439 *	5770.881 *	5482.075 *	4983.608 *	4325.027 *	3413.808 *	2091.285 *	639.487	16.267	1.171
22.5	7105.28 *	7104.071 *	7100.255 *	7093.674 *	7066.74 *	7022.801 *	6974.049 *	6918.458 *	6853.667 *	6779.106 *	6676.194 *	6539.631 *	6370.468 *	6152.951 *	5878.862 *	5543.726 *	5077.342 *	4473.23 *	3570.09 *	2170.426 *	684.637	18.09	1.171
19.5	7129.525 *	7129.796 *	7128.36 *	7123.904 *	7092.04 *	7053.161 *	7007.011 *	6945.893 *	6880.762 *	6810.139 *	6710.712 *	6574.192 *	6409.047 *	6187.729 *	5935.865 *	5600.837 *	5125.122 *	4552.438 *	3649.358 *	2222.066 *	725.356	19.769	1.171
17	7150.04 *	7152.669 *	7155.066 *	7147.484 *	7115.587 *	7077.54 *	7028.894 *	6969.622 *	6903.252 *	6832.663 *	6740.544 *	6599.999 *	6431.817 *	6228.836 *	5982.913 *	5636.538 *	5161.511 *	4593.571 *	3702.317 *	2259.611 *	755.985 *	21.05	1.171
15	7162.89 *	7166.118 *	7170.517 *	7161.11 *	7134.265 *	7099.324 *	7049.841 *	6989.442 *	6927.923 *	6863.892 *	6766.639 *	6619.419 *	6464.68 *	6271.099 *	6016.087 *	5660.647 *	5182.605 *	4639.643 *	3736.304 *	2286.137 *	777.548 *	21.993	1.171
13	7183.68 *	7191.655 *	7200.208 *	7189.8 *	7165.554 *	7130.78 *	7083.789 *	7018.584 *	6965.363 *	6900.712 *	6796.173 *	6650.835 *	6504.296 *	6308.333 *	6046.941 *	5682.955 *	5223.166 *	4677.807 *	3767.95 *	2310.071 *	796.5 *	22.859	1.171
11	7230.44 *	7242.855 *	7254.2 *	7244.266 *	7217.004 *	7180.894 *	7130.651 *	7069.372 *	7008.517 *	6940.512 *	6829.748 *	6689.666 *	6538 *	6339.19 *	6074.624 *	5709.35 *	5248.078 *	4708.568 *	3789.728 *	2328.576 *	812.851 *	25.094	1.171
9	7280.21 *	7289.688 *	7295.391 *	7286.296 *	7255.162 *	7222.215 *	7165.729 *	7104.761 *	7047.17 *	6972.115 *	6861.603 *	6723.658 *	6568.284 *	6363.279 *	6107.267 *	5738.166 *	5274.409 *	4733.515 *	3808.541 *	2341.671 *	826.619 *	25.327	1.171
7	7290.82 *	7302.813 *	7307.093 *	7294.146 *	7268.836 *	7227.927 *	7177.641 *	7123.905 *	7059.203 *	6984.986 *	6880.22 *	6744.599 *	6592.266 *	6386.482 *	6121.084 *	5764.185 *	5294.535 *	4752.749 *	3821.213 *	2349.384 *	837.821 *	25.562	1.171
5	7289.67 *	7307.428 *	7311.137 *	7297.299 *	7270.38 *	7231.931 *	7188.34 *	7131.721 *	7064.006 *	6988.367 *	6891.159 *	6763.022 *	6611.783 *	6404.344 *	6133.589 *	5773.993 *	5308.67 *	4765.364 *	3827.533 *	2351.761 *	854.149 *	25.798	1.171
3	7296.16 *	7326.37 *	7319.511 *	7305.813 *	7281.156 *	7246.146 *	7196.335 *	7138.605 *	7074.5 *	7003.854 *	6907.834 *	6775.935 *	6623.043 *	6414.171 *	6139.499 *	5780.535 *	5315.149 *	4770.424 *	3835.044 *	2354.62 *	855.379 *	26.034	1.171
1	7314.34 *	7337.576 *	7332.782 *	7322.146 *	7294.921 *	7259.4 *	7211.295 *	7152.584 *	7088.615 *	7016.34 *	6916.405 *	6782.248 *	6626.956 *	6416.795 *	6139.242 *	5779.082 *	5313.852 *	4767.843 *	3821.213 *	2341.37 *	856.613 *	26.39	1.171
0	7330.615 *	7336.16 *	7335.66 *	7319.22 *	7294.84 *	7261.27 *	7213.18 *	7154.44 *	7090.63 *	7017.54 *	6917.605 *	6782.495 *	6625.95 *	6413.4 *	6134.82 *	5775.355 *	5310.26 *	4763.67 *	3814.29 *	2334.74 *	857.23 *	26.39	1.171
-1	7308.08 *	7320.701 *	7323.376 *	7310.375 *	7283.342 *	7248.916 *	7198.257 *	7138.615 *	7072.559 *	6997.876 *	6896.338 *	6762.237 *	6606.214 *	6395.179 *	6116.44 *	5757.036 *	5296.186 *	4755.428 *	3815.888 *	2338.814 *	853.331 *	26.286	1.171
-3	7266.44 *	7278.343 *	7276.645 *	7265.175 *	7238.871 *	7204.301 *	7156.719 *	7093.9 *	7024.584 *	6947.785 *	6847.407 *	6715.665 *	6560.435 *	6349.223 *	6070.577 *	5714.592 *	5262.356 *	4733.432 *	3819.079 *	2346.954 *	845.537 *	26.079	1.171
-5	7201.24 *	7210.579 *	7206.229 *	7197.468 *	7172.053 *	7133.771 *	7094.197 *	7035.02 *	6967.467 *	6890.19 *	6789.34 *	6661.911 *	6506.182 *	6295.88 *	6017.267 *	5664.739 *	5221.358 *	4704.557 *	3801.323 *	2338.804 *	837.761 *	25.871	1.171
-7	7138.56 *	7144.798 *	7140.838 *	7129.907 *	7107.731 *	7069.295 *	7023.598 *	6969.488 *	6900.225 *	6823.703 *	6720.464 *	6594.769 *	6443.581 *	6234.188 *	5955.241 *	5612.47 *	5173.705 *	4669.38 *	3785.081 *	2331.016 *	814.943 *	25.665	1.171
-9	7062.04 *	7070.737 *	7067.284 *	7055.727 *	7029.771 *	6992.86 *	6940.617 *	6885.532 *	6821.446 *	6743.951 *	6642.292 *	6518.4 *	6373.961 *	6166.051 *	5890.213 *	5543.619 *	5119.456 *	4628.174 *	3763.041 *	2317.664 *	797.287 *	25.459	1.171
-11	6956.73 *	6965.194 *	6960.412 *	6953.867 *	6925.324 *	6890.791 *	6838.529 *	6789.09 *	6730.961 *	6656.929 *	6553.788 *	6434.764 *	6298.009 *	6100.902 *	5822.169 *	5472.498 *	5058.888 *	4581.285 *	3735.561 *	2298.642 *	777.128 *	25.254	1.171
-13	6855.2 *	6861.835 *	6860.844 *	6850.245 *	6825.595 *	6794.338 *	6747.693 *	6692.169 *	6640.735 *	6575.602 *	6475.442 *	6345.336 *	6217.547 *	6033.152 *	5775.17 *	5424.671 *	5000.117 *	4529.424 *	3705.822 *	2273.864 *	754.459 *	23.048	1.171
-15	6781.49 *	6785.59 *	6783.082 *	6771.2 *	6746.01 *	6712.358 *	6672.732 *	6618.523 *	6562.455 *	6500.608 *	6413.535 *	6280.638 *	6133.442 *	5964.673 *	5727.761 *	5395.203 *	4940.813 *	4473.845 *	3665.933 *	2243.254 *	729.277	22.21	1.171
-17	6715.61 *	6718.266 *	6716.783 *	6707.583 *	6683.767 *	6648.542 *	6610.792 *	6563.051 *	6500.708 *	6435.608 *	6358.722 *	6238.577 *	6074.693 *	5898.99 *	5681.712 *	5359.99 *	4915.338 *	4414.699 *	3624.163 *	2207.043 *	701.584	21.296	1.171
-19.5	6662.515 *	6662.724 *	6660.397 *	6654.545 *	6630.976 *	6598.977 *	6560.31 *	6513.809 *	6456.043 *	6388.37 *	6306.753 *	6187.317 *	6035.549 *	5838.783 *	5625.405 *	5313.189 *	4876.702 *	4364.893 *	3563.768 *	2153.023 *	663.451	20.049	1.171
-22.5	6627.97 *	6626.565 *	6621.615 *	6614.039 *	6590.862 *	6556.667 *	6519.216 *	6472.011 *	6407.634 *	6342.187 *	6255.098 *	6133.557 *	5984.226 *	5798.342 *	5560.06 *	5250.55 *	4820.489 *	4276.803 *	3479.864 *	2077.679 *	614.08	18.411	1.171
-25.5	6555.765 *	6554.798 *	6549.412 *	6539.722 *	6521.756 *	6484.976 *	6443.276 *	6398.349 *	6345.065 *	6279.167 *	6187.835 *	6066.807 *	5916.524 *	5722.499 *	5456.997 *	5170.661 *	4720.521 *	4147.333 *	3302.96 *	1975.434 *	560.717	16.628	1.171
-29	6442.08 *	6442.347 *	6435.339 *	6422.891 *	6404.618 *	6366.14 *	6320.603 *	6272.208 *	6224.95 *	6155.849 *	6038.284 *	5914.701 *	5796.278 *	5572.801 *	5263.413 *	4962.933 *	4563.118 *	3926.702 *	3066.956 *	1840.061 *	492.166	14.379	1.171
-33	6092.33 *	6099.685 *	6097.952 *	6085.054 *	6060.734 *	6035.14 *	5969.849 *	5912.662 *	5852.154 *	5788.718 *	5670.78 *	5504.745 *	5371.528 *	5220.31 *	4833.185 *	4522.018 *	4231.748 *	3571.009 *	2757.197 *	1660 *	416.548	11.607	1.171
-37.5	5213.32 *	5223.716 *	5229.38 *	5215.527 *	5194.598 *	5123.5 *	5093.541 *	5053.345 *	4994.869 *	4924.937 *	4819.417 *	4708.169 *	4586.737 *	4416.125 *	4128.268 *	3872.778 *	3561.127 *	3064.088 *	2350.82 *	1384.612 *	329.752	8.75	1.171
-42.5	4079.465 *	4086.808 *	4089.937 *	4077.754 *	4050.442 *	4007.154 *	3969.94 *	3964.087 *	3905.908 *	3852.22 *	3773.965 *	3696.77 *	3597.825 *	3440.174 *	3244.952 *	3060.912 *	2774.084 *	2393.083 *	1838.96 *	1028.071 *	237.862	6.533	1.171
-47.5	3066.82 *	3073.615 *	3077.063 *	3067.506 *	3045.6 *	3011.535 *	2965.362 *	2949.325 *	2922.626 *	2880.635 *	2808.763 *	2709.183 *	2640.614 *	2523.423 *	2372.324 *	2186.032 *	1938.974 *	1707.627 *	1280.627 *	713.856	146.181	4.467	1.171
-55	1316.98 *	1326.39 *	1345.199 *	1330.278 *	1316.886 *	1292.996 *	1258.776 *	1235.588 *	1230.207 *	1218.171 *													

## 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	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0
65	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.9	0.8	0.9	1.1	1.2	1.1	1	1.4	1.2	0.5	0.1	0	0	0
55	3.26 *	6.62 *	6.68 *	6.66 *	6.60 *	6.46 *	6.29 *	6.21 *	6.24 *	7.76 *	9.01 *	8.36 *	9.03 *	9.81 *	10.23 *	9.57 *	7.8	8.9	6.6	2.1	0.2	0	0	0
47.5	6.18 *	12.43 *	12.45 *	12.40 *	12.29 *	12.09 *	11.82 *	11.59 *	11.40 *	14.01 *	16.37 *	15.45 *	16.67 *	17.75 *	18.34 *	17.56 *	14.17 *	15.74 *	11.60 *	3.7	0.4	0	0	0
42.5	5.76 *	11.54 *	11.52 *	11.45 *	11.34 *	11.21 *	11.11 *	10.97 *	10.72 *	12.98 *	15.06 *	14.53 *	16.12 *	16.94 *	17.14 *	16.88 *	14.02 *	15.43 *	11.51 *	3.8	0.5	0	0	0
37.5	7.25 *	14.51 *	14.49 *	14.40 *	14.24 *	14.07 *	13.98 *	13.83 *	13.55 *	16.40 *	18.93 *	18.23 *	20.31 *	21.40 *	21.51 *	21.00 *	17.63 *	19.37 *	14.50 *	4.95 *	0.6	0	0	0
33	7.92 *	15.84 *	15.79 *	15.69 *	15.55 *	15.41 *	15.22 *	14.94 *	14.60 *	17.80 *	20.74 *	19.85 *	21.73 *	22.97 *	23.39 *	22.61 *	18.71 *	20.46 *	15.45 *	5.37 *	0.6	0	0	0
29	7.96 *	15.90 *	15.84 *	15.74 *	15.61 *	15.45 *	15.23 *	14.94 *	14.63 *	17.79 *	20.63 *	19.83 *	21.79 *	22.78 *	23.21 *	22.69 *	18.60 *	20.30 *	15.48 *	5.37 *	0.7	0	0	0
25.5	7.45 *	14.88 *	14.82 *	14.74 *	14.60 *	14.41 *	14.19 *	13.95 *	13.69 *	16.63 *	19.18 *	18.41 *	20.31 *	21.25 *	21.60 *	21.12 *	17.32 *	19.11 *	14.68 *	5.09 *	0.6	0	0	0
22.5	6.47 *	12.92 *	12.88 *	12.81 *	12.69 *	12.54 *	12.36 *	12.16 *	11.92 *	14.53 *	16.83 *	16.11 *	17.74 *	18.74 *	19.10 *	18.57 *	15.35 *	17.20 *	13.26 *	4.61 *	0.6	0	0	0
19.5	6.50 *	12.99 *	12.95 *	12.87 *	12.75 *	12.61 *	12.43 *	12.23 *	11.99 *	14.62 *	16.95 *	16.22 *	17.88 *	18.97 *	19.34 *	18.78 *	15.67 *	17.73 *	13.70 *	4.80 *	0.6	0	0	0
17	5.44 *	10.86 *	10.83 *	10.76 *	10.67 *	10.55 *	10.40 *	10.22 *	10.03 *	12.23 *	14.18 *	13.57 *	14.98 *	15.91 *	16.23 *	15.76 *	13.21 *	15.02 *	11.63 *	4.11 *	0.6	0	0	0
15	4.36 *	8.71 *	8.68 *	8.63 *	8.56 *	8.46 *	8.34 *	8.20 *	8.05 *	9.82 *	11.38 *	10.89 *	12.04 *	12.80 *	13.05 *	12.66 *	10.64 *	12.14 *	9.42 *	3.35 *	0.5	0	0	0
13	4.37 *	8.73 *	8.71 *	8.66 *	8.58 *	8.49 *	8.37 *	8.23 *	8.08 *	9.86 *	11.42 *	10.94 *	12.10 *	12.86 *	13.10 *	12.71 *	10.71 *	12.24 *	9.50 *	3.40 *	0.5	0	0	0
11	4.39 *	8.78 *	8.75 *	8.70 *	8.63 *	8.53 *	8.41 *	8.27 *	8.12 *	9.90 *	11.47 *	10.99 *	12.16 *	12.92 *	13.14 *	12.77 *	10.77 *	12.32 *	9.57 *	3.44 *	0.5	0	0	0
9	4.42 *	8.84 *	8.81 *	8.76 *	8.68 *	8.58 *	8.46 *	8.32 *	8.16 *	9.95 *	11.53 *	11.04 *	12.21 *	12.97 *	13.20 *	12.82 *	10.83 *	12.38 *	9.62 *	3.48 *	0.5	0	0	0
7	4.44 *	8.87 *	8.84 *	8.79 *	8.72 *	8.61 *	8.49 *	8.35 *	8.19 *	9.99 *	11.57 *	11.09 *	12.26 *	13.02 *	13.26 *	12.89 *	10.87 *	12.42 *	9.65 *	3.50 *	0.5	0	0	0
5	4.44 *	8.88 *	8.85 *	8.80 *	8.72 *	8.63 *	8.51 *	8.37 *	8.20 *	10.01 *	11.60 *	11.12 *	12.29 *	13.05 *	13.30 *	12.93 *	10.90 *	12.45 *	9.66 *	3.52 *	0.5	0	0	0
3	4.45 *	8.89 *	8.86 *	8.81 *	8.73 *	8.63 *	8.51 *	8.37 *	8.21 *	10.02 *	11.63 *	11.14 *	12.32 *	13.08 *	13.32 *	12.95 *	10.92 *	12.46 *	9.67 *	3.53 *	0.5	0	0	0
1	4.45 *	8.91 *	8.88 *	8.82 *	8.75 *	8.65 *	8.52 *	8.38 *	8.23 *	10.04 *	11.65 *	11.16 *	12.33 *	13.08 *	13.33 *	12.96 *	10.92 *	12.45 *	9.65 *	3.53 *	0.5	0	0	0
0	2.23 *	4.46 *	4.44 *	4.42 *	4.38 *	4.33 *	4.27 *	4.20 *	4.12 *	5.02 *	5.83 *	5.58 *	6.16 *	6.54 *	6.66 *	6.48 *	5.45 *	6.21 *	4.81 *	1.76 *	0.3	0	0	0
0	2.23 *	4.46 *	4.44 *	4.41 *	4.38 *	4.33 *	4.26 *	4.19 *	4.11 *	5.02 *	5.82 *	5.57 *	6.15 *	6.53 *	6.65 *	6.47 *	5.45 *	6.20 *	4.80 *	1.76 *	0.3	0	0	0

-1	4.44 *	8.89 *	8.85 *	8.80 *	8.72 *	8.62 *	8.50 *	8.35 *	8.19 *	9.99 *	11.58 *	11.09 *	12.25 *	13.00 *	13.24 *	12.87 *	10.85 *	12.38 *	9.61 *	3.52 *	0.5	0	0
-3	4.41 *	8.82 *	8.79 *	8.73 *	8.66 *	8.56 *	8.44 *	8.30 *	8.14 *	9.92 *	11.50 *	11.01 *	12.16 *	12.91 *	13.15 *	12.78 *	10.79 *	12.33 *	9.60 *	3.51 *	0.5	0	0
-5	4.37 *	8.74 *	8.71 *	8.65 *	8.58 *	8.48 *	8.37 *	8.23 *	8.07 *	9.83 *	11.40 *	10.92 *	12.06 *	12.80 *	13.04 *	12.68 *	10.71 *	12.26 *	9.56 *	3.49 *	0.5	0	0
-7	4.33 *	8.65 *	8.62 *	8.57 *	8.50 *	8.40 *	8.28 *	8.14 *	7.99 *	9.73 *	11.28 *	10.81 *	11.95 *	12.68 *	12.91 *	12.56 *	10.61 *	12.17 *	9.51 *	3.47 *	0.5	0	0
-9	4.27 *	8.54 *	8.52 *	8.47 *	8.39 *	8.29 *	8.17 *	8.04 *	7.89 *	9.62 *	11.15 *	10.69 *	11.82 *	12.55 *	12.76 *	12.41 *	10.50 *	12.07 *	9.44 *	3.44 *	0.5	0	0
-11	4.21 *	8.42 *	8.39 *	8.34 *	8.27 *	8.18 *	8.06 *	7.93 *	7.79 *	9.49 *	11.00 *	10.55 *	11.68 *	12.41 *	12.63 *	12.27 *	10.38 *	11.95 *	9.37 *	3.40 *	0.5	0	0
-13	4.16 *	8.31 *	8.28 *	8.23 *	8.16 *	8.07 *	7.96 *	7.83 *	7.69 *	9.38 *	10.87 *	10.42 *	11.54 *	12.29 *	12.52 *	12.16 *	10.26 *	11.81 *	9.27 *	3.35 *	0.5	0	0
-15	4.11 *	8.22 *	8.20 *	8.15 *	8.08 *	7.99 *	7.88 *	7.75 *	7.60 *	9.28 *	10.77 *	10.31 *	11.40 *	12.15 *	12.42 *	12.06 *	10.15 *	11.66 *	9.16 *	3.30 *	0.5	0	0
-17	5.09 *	10.18 *	10.16 *	10.10 *	10.01 *	9.89 *	9.76 *	9.60 *	9.42 *	11.50 *	13.35 *	12.78 *	14.11 *	15.03 *	15.38 *	14.96 *	12.56 *	14.38 *	11.26 *	4.02 *	0.6	0	0
-20	6.07 *	12.13 *	12.10 *	12.03 *	11.92 *	11.79 *	11.63 *	11.44 *	11.22 *	13.68 *	15.88 *	15.21 *	16.78 *	17.83 *	18.24 *	17.75 *	14.89 *	16.97 *	13.20 *	4.67 *	0.6	0	0
-23	6.02 *	12.03 *	12.00 *	11.93 *	11.83 *	11.69 *	11.53 *	11.34 *	11.12 *	13.56 *	15.73 *	15.05 *	16.61 *	17.62 *	17.97 *	17.49 *	14.62 *	16.51 *	12.75 *	4.47 *	0.6	0	0
-26	6.93 *	13.84 *	13.80 *	13.73 *	13.61 *	13.44 *	13.25 *	13.04 *	12.79 *	15.58 *	18.04 *	17.28 *	19.07 *	20.14 *	20.46 *	19.90 *	16.57 *	18.42 *	14.10 *	4.92 *	0.6	0	0
-29	7.64 *	15.27 *	15.23 *	15.15 *	15.02 *	14.83 *	14.60 *	14.36 *	14.08 *	17.14 *	19.78 *	18.92 *	20.92 *	22.01 *	22.14 *	21.58 *	17.95 *	19.65 *	14.93 *	5.18 *	0.6	0	0
-33	7.76 *	15.53 *	15.50 *	15.42 *	15.27 *	15.08 *	14.86 *	14.61 *	14.33 *	17.43 *	20.10 *	19.20 *	21.25 *	22.34 *	22.37 *	21.80 *	18.19 *	19.81 *	14.93 *	5.14 *	0.6	0	0
-38	7.09 *	14.20 *	14.18 *	14.11 *	13.95 *	13.77 *	13.62 *	13.42 *	13.15 *	15.98 *	18.49 *	17.73 *	19.59 *	20.59 *	20.75 *	20.21 *	16.86 *	18.45 *	13.78 *	4.66 *	0.6	0	0
-43	5.45 *	10.93 *	10.93 *	10.87 *	10.76 *	10.61 *	10.48 *	10.34 *	10.14 *	12.34 *	14.26 *	13.65 *	15.06 *	15.84 *	16.02 *	15.54 *	12.89 *	14.20 *	10.56 *	3.5	0.4	0	0
-48	5.02 *	10.12 *	10.14 *	10.09 *	9.98 *	9.81 *	9.64 *	9.51 *	9.38 *	11.44 *	13.17 *	12.48 *	13.77 *	14.64 *	14.79 *	14.13 *	11.81 *	13.20 *	9.9	3.4	0.4	0	0
-55	2.2	4.5	4.5	4.5	4.4	4.4	4.3	4.2	4.2	5.1	5.9	5.6	6.2	6.7	6.9	6.5	5.7	6.7	5.4	2.1	0.2	0	0
-65	0.3	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.8	0.7	0.9	1	1.1	1.1	1.1	1.5	1.4	0.6	0.1	0	0
-75	0.1	0.2	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	0.4	0.3	0.4	0.4	0.2	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	198	397	396	394	390	385	380	374	367	447	518	496	547	579	589	572	479	539	414	146	19.3	0.08	8626

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

Model No.	FFLEDL @ 120W / 5000K/480	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
480.03	60	0.255	104.9	0.856	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\*\*\*\*\*