

Photometric Test Report

Relevant Standards

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

Prepared For

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2021/10/28

Issue Date

2021/11/1

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		18739
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	159.5
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		117.5
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.78%
		20.00%	277V	16.18%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.994
		0.9	277V	0.868
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3985±275	4139
		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		5
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		120
(Goniophotometer - Section 4.2)		Non-Worst Case		277
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.994
(Goniophotometer - Section 4.2)		Non-Worst Case		0.482
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		117.5
(Goniophotometer - Section 4.2)		Non-Worst Case		116.2

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/10/28	FFLEDL @ 120W / 4000K	K1
2	Goniophotometer Test	2021/10/28	FFLEDL @ 120W / 4000K	K1
3	THD and PF Test	2021/10/28	FFLEDL @ 120W / 4000K	K1

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 / 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.	FFLEDL @ 120W / 4000K	Sample ID.	K1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.4	Humidity (%RH)	54.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.97	60	0.987	117.7	0.994
277.05	60	0.483	116.1	0.868

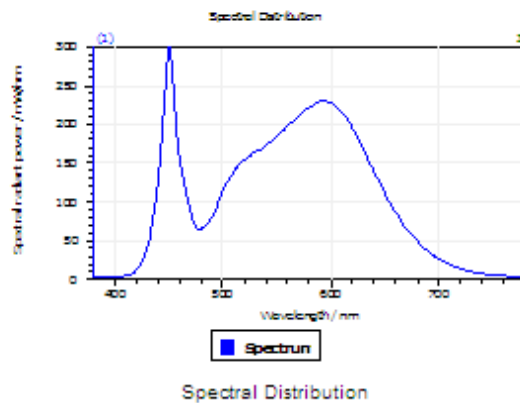
Test Result

CCT (K)	CRI	R9	Duv
4139	83	5	0.0012

Rf	Rg	IES Rcs,h1
83	96	-12%

4.1 Integrating Sphere Test

Results

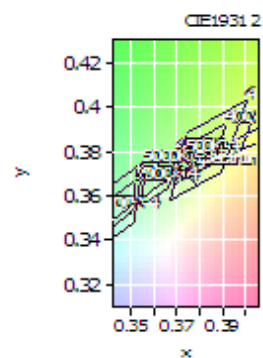


Spectral values

DominantWavelength 579.26 nm
Purity 0.233
PeakWavelength 450.58 nm
Radiant Power 40.4 W
Width50%:

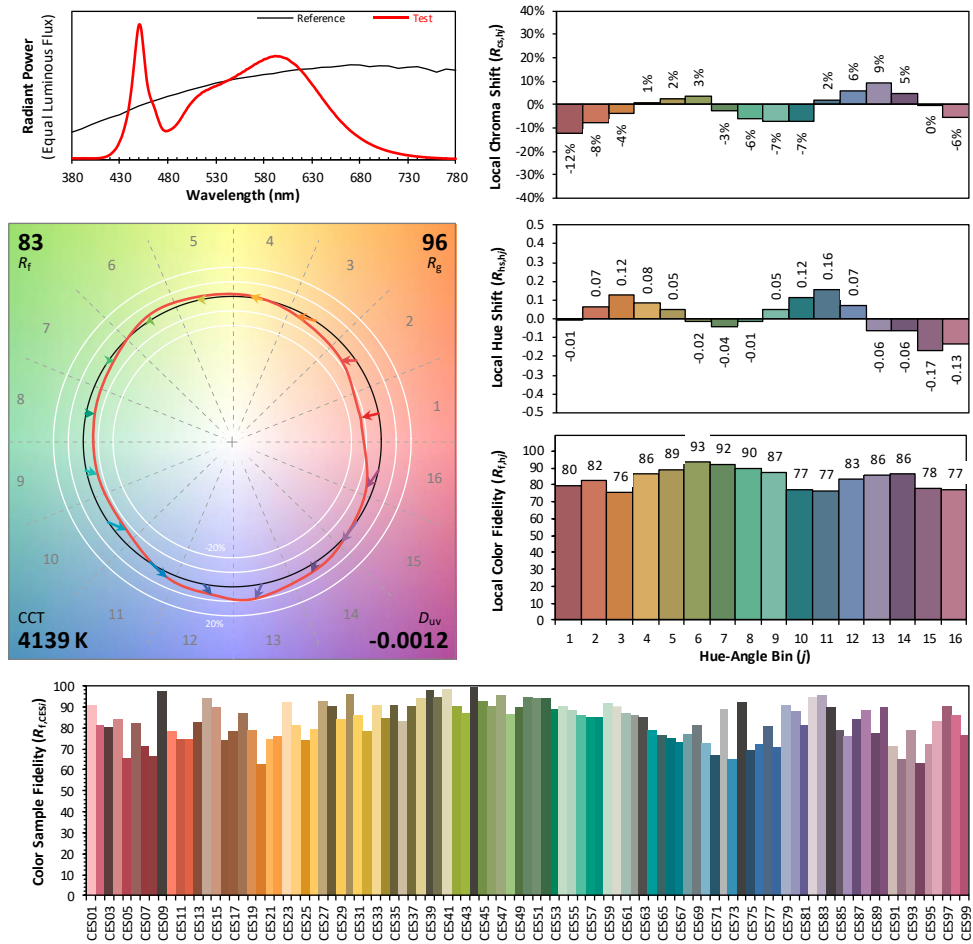
Color Coordinates

Correlated Color Temperat 4139 K
x: 0.3738 u: 0.2234 u': 0.2234
y: 0.3701 v: 0.3318 v': 0.4976
CRI01 80.9 CRI09 5.3
CRI02 89.1 CRI10 74.2
CRI03 94.6 CRI11 80.7
CRI04 81.5 CRI12 62.6
CRI05 81.4 CRI13 83.0
CRI06 84.8 CRI14 97.3
CRI07 84.8 CRI15 74.5
CRI08 63.2 CRI16 72.3
ResultsCRI 82.5



PlanckDistance 1.2E-003

4.1 Integrating Sphere Test



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

x 0.3738
 y 0.3701
 u' 0.2234
 v' 0.4976

CIE 13.3-1995
(CRI)

R_a 83
 R_g 7

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 / 4000K	Sample ID.	K1
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	120.05	60	0.994	117.5	0.984
NON-WORST CASE	277.04	60	0.482	116.2	0.870

Test Result

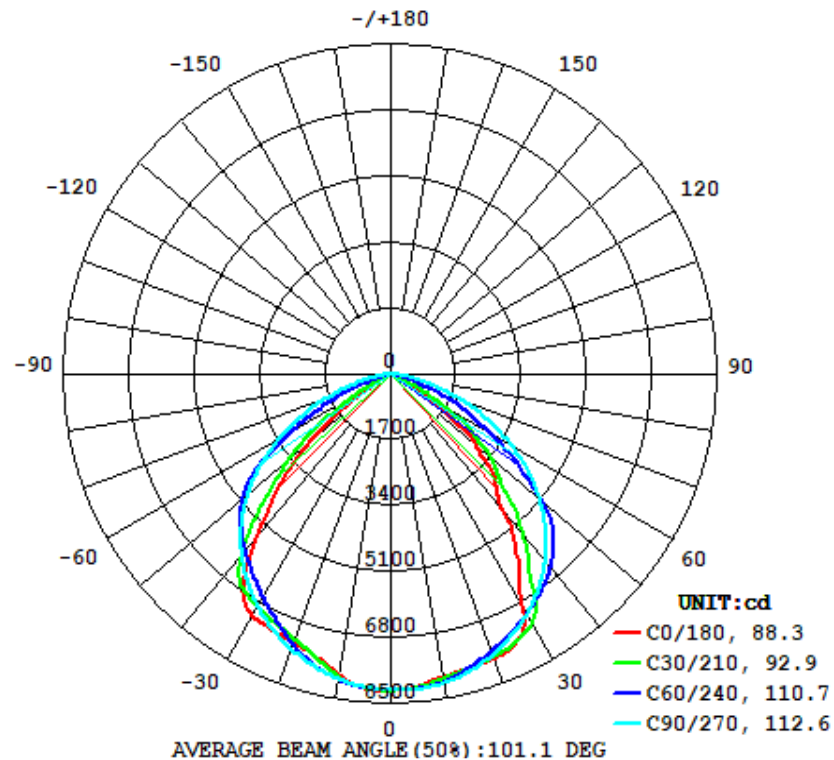
Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
18739	116.9	152.8	88.3	112.6	159.5

Zonal Lumen Requirement
(0° - 90°)

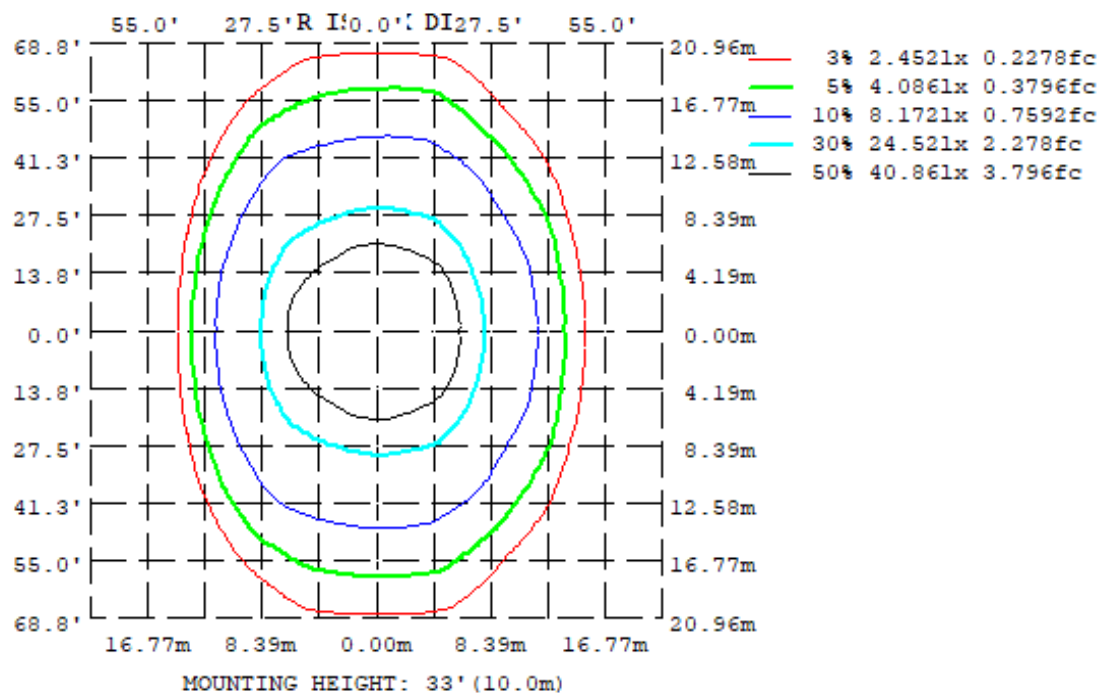
99.89%

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	7917	7990	8084	8012	7879	7974	7979	7915
20	7816	7672	7721	7401	7375	7287	7552	7557
30	6882	7327	7126	6920	7195	6754	6920	7182
40	4511	6151	6283	6402	5398	6213	6033	5786
50	2971	4025	5109	4528	2872	4379	4879	3623
60	679.7	2215	3619	2101	444.5	1942	3392	2083
70	24.32	228.9	1953	189.4	96.19	177.0	1721	178.9
80	0.6644	2.489	445.8	50.33	13.69	40.80	282.5	0.7104
90	0.3866	0.8906	1.100	2.056	0.1967	1.731	0.4960	0.3638
100	0.5300	1.179	1.442	1.864	3.614	1.589	1.436	0.7679
110	1.205	1.924	2.511	1.931	1.079	1.876	2.441	1.498
120	2.245	2.706	3.225	2.596	1.747	2.453	3.104	2.179
130	3.602	3.512	4.110	3.580	2.968	3.342	4.121	3.216
140	4.725	4.544	4.762	4.518	4.607	4.898	5.146	4.754
150	5.615	5.568	5.046	5.353	5.464	5.632	5.867	5.798
160	6.209	5.869	5.412	5.716	6.564	6.146	6.013	6.341
170	6.283	5.842	5.507	5.799	6.091	6.035	5.604	5.667
180	7.100	6.529	5.859	6.607	6.812	6.633	6.235	6.436
DEG	LUMINOUS INTENSITY:cd							

	Zonal (lm)		Total (lm)	Percent
0-10	771.15	0 - 10	771.15	4.12%
10-20	2197.60	0 - 20	2968.75	15.84%
20-30	3390.89	0 - 30	6359.64	33.94%
30-40	4074.92	0 - 40	10434.56	55.68%
40-50	3850.51	0 - 50	14285.07	76.23%
50-60	2788.05	0 - 60	17073.12	91.11%
60-70	1284.98	0 - 70	18358.10	97.97%
70-80	339.38	0 - 80	18697.48	99.78%
80-90	21.59	0 - 90	18719.08	99.89%
90-100	1.98	0 - 100	18721.06	99.91%
100-110	1.56	0 - 110	18722.62	99.91%
110-120	2.09	0 - 120	18724.72	99.92%
120-130	2.69	0 - 130	18727.41	99.94%
130-140	3.23	0 - 140	18730.64	99.96%
140-150	3.25	0 - 150	18733.88	99.97%
150-160	2.70	0 - 160	18736.59	99.99%
160-170	1.69	0 - 170	18738.28	100.00%
170-180	0.58	0 - 180	18738.86	100.00%

4.2 Goniophotometer Test

Axial Candela

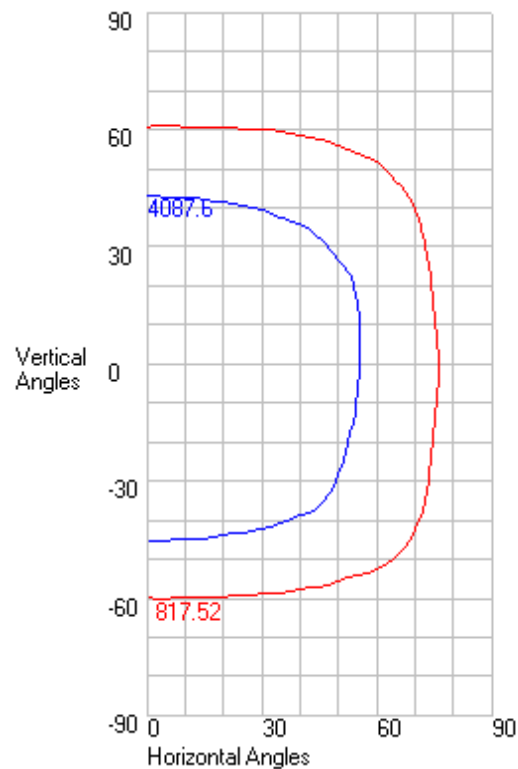
DEG.	HOR.	DEG.	VERT.
90	0.5	90	0.391
85	14.89	85	0.64
75	917.68	75	1.43
65	2564.25	65	80.05
55	4167.89	55	1825.27
47.5	5197.75	47.5	3341.425
42.5	5770.715	42.5	4148.63
37.5	6279.775	37.5	5293.115
33	6681.67	33	6229.01
29	6995.38	29	7232.29
25.5	7233.79	25.5	7648.82
22.5	7416.33	22.5	7774.135
19.5	7578.265	19.5	7819.785
17	7698.53	17	7834.42
15	7789.27	15	7844.54
13	7872.75	13	7864.42
11	7947.46	11	7898.7
9	8007.21	9	7939.8
7	8059.52	7	8002.79
5	8097.54	5	8082.25
3	8125.23	3	8129.71
1	8144.18	1	8158.79
0	8153.694	0	8153.694
-1	8157.19	-1	8175.2
-3	8160.33	-3	8167.6
-5	8154.46	-5	8132.95
-7	8137.69	-7	8071.93
-9	8105.99	-9	7954.89
-11	8058.42	-11	7803.09
-13	7995.74	-13	7667.2
-15	7924.03	-15	7550.25
-17	7844.61	-17	7463.01
-19.5	7744.5	-19.5	7386.36
-22.5	7591.365	-22.5	7337.28
-25.5	7418.355	-25.5	7287.735
-29	7197.79	-29	7221.54
-33	6896.34	-33	6989.94
-37.5	6520.09	-37.5	6098.465
-42.5	6014.375	-42.5	4721.06
-47.5	5426.745	-47.5	3540.59
-55	4406.97	-55	1446.04
-65	2792.95	-65	150.09
-75	1140.96	-75	52.8
-85	41.68	-85	11.49
-90	1.101	-90	0.206

4.2 Goniophotometer Test

Characteristics

NEMA Type	7 H x 6 V
Maximum Candela	8175.2
Maximum Candela Angle	0 H -1 V
Horizontal Beam Angle (50%)	112.5
Vertical Beam Angle (50%)	88.1
Horizontal Field Angle (10%)	154
Vertical Field Angle (10%)	120.6
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	14671
Beam Efficiency	N.A.
Field Lumens	18323
Field Efficiency	N.A.
Spill Lumens	416
Luminaire Lumens	18739
Total Efficiency	N.A.
Total Luminaire Watts	117.451
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	0.391	0.386	0.375	0.364	0.354	0.343	0.332	0.322	0.311	0.312	0.314	0.316	0.318	0.32	0.329	0.341	0.354	0.369	0.394	0.41	0.41	0.47	0.5
85	0.64	0.637	0.63	0.623	0.617	0.61	0.603	0.594	0.587	0.584	0.581	0.577	0.573	0.568	0.572	0.58	0.584	0.596	0.624	0.581	0.455	0.477	0.5
75	1.43	1.478	1.575	1.672	1.691	1.718	1.715	1.674	1.71	1.978	2.016	1.909	1.778	1.312	2.693	2.417	1.163	3.712	2.396	5.152	0.639	0.53	0.5
65	80.05	83.899	91.596	95.775	98.989	99.648	97.233	91.238	92.881	100.883	107.034	101.86	88.362	92.521	123.334	108.501	68.042	125.476	58.937	85.319	15.258	0.654	0.5
55	1825.27 *	1836.612 *	1859.283 *	1850.99 *	1844.853 *	1830.05 *	1807.088 *	1799.92 *	1794.699 *	1766.549 *	1708.276 *	1637.285 *	1571.153 *	1545.039 *	1493.31 *	1344.007 *	1151.954 *	988.924 *	713.804	387.504	67.186	0.78	0.5
47.5	3341.425 *	3356.205 *	3373.087 *	3372.085 *	3352.102 *	3319.976 *	3268.427 *	3236.032 *	3235.603 *	3245.888 *	3194.746 *	3031.232 *	2926.847 *	2885.04 *	2786.689 *	2480.287 *	2255.112 *	1971.054 *	1518.462 *	764.713	179.862	1.043	0.5
42.5	4148.63 *	4151.28 *	4149.932 *	4139.277 *	4118.842 *	4091.185 *	4072.273 *	4056.852 *	4004.411 *	3943.511 *	3863.633 *	3826.013 *	3802.978 *	3581.801 *	3336.368 *	3263.564 *	2950.807 *	2475.783 *	2055.405 *	1107.763 *	280.729	1.25	0.5
37.5	5293.115 *	5302.665 *	5308.293 *	5296.007 *	5276.446 *	5219.448 *	5194.229 *	5132.182 *	5058.834 *	4975.909 *	4917.53 *	4781.692 *	4584.012 *	4489.038 *	4281.139 *	3914.508 *	3654.978 *	3201.732 *	2583.386 *	1433.101 *	381.986	1.473	0.5
33	6229.01 *	6240.829 *	6241.333 *	6225.069 *	6190.753 *	6166.316 *	6104.647 *	6034.303 *	5961.225 *	5881.329 *	5835.157 *	5683.966 *	5490.679 *	5287.245 *	5080.458 *	4810.999 *	4282.412 *	3735.471 *	2993.085 *	1691.412 *	473.105	3.629	0.5
29	7232.29 *	7245.546 *	7230.802 *	7199.459 *	7160.726 *	7075.581 *	6981.935 *	6938.908 *	6891.077 *	6723.894 *	6543.694 *	6501.998 *	6383.74 *	5917.175 *	5682.848 *	5474.441 *	4767.119 *	4164.236 *	3360.928 *	1892.205 *	551.904	5.738	0.5
25.5	7648.82 *	7644.705 *	7630.284 *	7609.666 *	7574.336 *	7516.647 *	7450.097 *	7382.572 *	7301.197 *	7201.186 *	7071.894 *	6928.264 *	6744.8 *	6436.886 *	6085.823 *	5849.236 *	5182.297 *	4480.892 *	3675.153 *	2049.403 *	622.013	7.453	0.5
22.5	7774.135 *	7766.977 *	7749.831 *	7729.764 *	7688.97 *	7635.275 *	7576.222 *	7507.952 *	7424.405 *	7336.751 *	7223.964 *	7069.079 *	6876.503 *	6635.3 *	6351.625 *	5957.6 *	5400.884 *	4704.386 *	3918.14 *	2170.514 *	676.301	8.816	0.5
19.5	7819.785 *	7812.416 *	7796.441 *	7778.461 *	7734.55 *	7685.197 *	7631.635 *	7558.998 *	7479.468 *	7397.112 *	7285.295 *	7124.856 *	6944.485 *	6718.415 *	6428.628 *	6027.235 *	5500.076 *	4892.627 *	4004.444 *	2289.956 *	725.245	10.07	0.5
17	7834.42 *	7828.288 *	7814.089 *	7792.362 *	7751.602 *	7706.081 *	7647.456 *	7577.993 *	7501.852 *	7419.725 *	7307.679 *	7150.031 *	6974.723 *	6755.925 *	6461.503 *	6064.555 *	5560.537 *	5020.615 *	4061.773 *	2374.091 *	762.415	11.024	0.5
15	7844.54 *	7839.594 *	7827.211 *	7802.829 *	7765.456 *	7719.486 *	7661.157 *	7591.548 *	7517.89 *	7437.212 *	7321.897 *	7163.118 *	6996.874 *	6782.656 *	6480.405 *	6085.34 *	5588.682 *	5065.25 *	4099.355 *	2428.113 *	789.729	11.725	0.5
13	7864.42 *	7861.14 *	7849.914 *	7823.197 *	7785.983 *	7740.042 *	7680.424 *	7610.601 *	7539.506 *	7455.819 *	7335.988 *	7184.123 *	7026.9 *	6805.593 *	6497.588 *	6094.333 *	5630.135 *	5105.402 *	4134.377 *	2470.816 *	814.8	12.366	0.5
11	7898.7 *	7896.233 *	7883.298 *	7856.7 *	7819.044 *	7770.903 *	7710.567 *	7645.88 *	7567.947 *	7478.961 *	7365.547 *	7225.769 *	7056.758 *	6824.909 *	6507.091 *	6118.255 *	5663.953 *	5139.345 *	4156.906 *	2505.274 *	837.548 *	14.094	0.5
9	7939.8 *	7939.69 *	7926.001 *	7896.39 *	7863.279 *	7814.146 *	7759.086 *	7686.457 *	7600.676 *	7523.235 *	7416.401 *	7263.792 *	7084.08 *	6841.295 *	6541.866 *	6164.504 *	5699.352 *	5166.228 *	4175.396 *	2531.832 *	857.893 *	14.238	0.5
7	8002.79 *	8005.746 *	7986.822 *	7959.049 *	7920.373 *	7876.847 *	7815.909 *	7740.011 *	7663.902 *	7581.541 *	7465.888 *	7300.259 *	7112.422 *	6882.573 *	6582.702 *	6208.505 *	5727.92 *	5185.559 *	4186.549 *	2550.862 *	875.758 *	14.382	0.5
5	8082.25 *	8077.093 *	8049.694 *	8026.79 *	7985.954 *	7938.064 *	7876.019 *	7801.126 *	7720.637 *	7634.697 *	7511.812 *	7344.572 *	7159.283 *	6924.805 *	6621.441 *	6235.066 *	5749.342 *	5197.875 *	4190.357 *	2562.771 *	899.664 *	14.527	0.5
3	8129.71 *	8104.971 *	8085.281 *	8060.07 *	8025.513 *	7975.218 *	7915.335 *	7843.539 *	7761.074 *	7670.654 *	7546.203 *	7380.256 *	7196.487 *	6959.437 *	6651.951 *	6259.008 *	5763.673 *	5203.368 *	4194.95 *	2574.473 *	906.86 *	14.672	0.5
1	8158.79 *	8122.623 *	8111.764 *	8089.019 *	8052.39 *	8000.515 *	7941.495 *	7867.369 *	7784.388 *	7693.564 *	7570.103 *	7406.778 *	7223.76 *	6986.835 *	6675.043 *	6274.958 *	5770.38 *	5201.549 *	4176.917 *	2567.66 *	914.072 *	14.89	0.5
0	8153.694 *	8144.18 *	8125.23 *	8097.54 *	8059.52 *	8007.21 *	7947.46 *	7872.75 *	7789.27 *	7698.53 *	7578.265 *	7416.33 *	7233.79 *	6995.38 *	6681.67 *	6279.775 *	5770.715 *	5197.75 *	4167.89 *	2564.25 *	917.68 *	14.89	0.5
-1	8175.2 *	8159.201 *	8136.316 *	8106.896 *	8067.604 *	8016.634 *	7953.452 *	7878.794 *	7794.768 *	7701.444 *	7577.933 *	7414.305 *	7230.664 *	6991.482 *	6675.012 *	6268.07 *	5758.125 *	5186.646 *	4164.193 *	2568.461 *	917.02 *	14.897	0.5
-3	8167.6 *	8161.325 *	8134.981 *	8102.339 *	8061.397 *	8013.706 *	7952.243 *	7875.563 *	7791.915 *	7695.82 *	7569.276 *	7403.026 *	7217.216 *	6972.805 *	6651.288 *	6237.95 *	5726.667 *	5158.511 *	4156.809 *	2576.877 *	915.701 *	14.91	0.5
-5	8132.95 *	8131.025 *	8104.392 *	8078.409 *	8031.461 *	7979.441 *	7920.298 *	7840.192 *	7762.167 *	7675.967 *	7550.084 *	7383.071 *	7193.886 *	6945.393 *	6618.666 *	6198.668 *	5686.868 *	5122.619 *	4127.78 *	2568.166 *	914.385 *	14.924	0.5
-7	8071.93 *	8071.153 *	8045.619 *	8014.336 *	7978.411 *	7918.732 *	7858.865 *	7785.1 *	7695.54 *	7603.524 *	7480.949 *	7332.909 *	7160.327 *	6907.929 *	6575.38 *	6155.441 *	5638.8 *	5079.171 *	4100.339 *	2560.269 *	895.624 *	14.937	0.5
-9	7954.89 *	7959.185 *	7938.692 *	7911.807 *	7872.05 *	7824.036 *	7751.927 *	7685.081 *	7607.691 *	7508.52 *	7381.086 *	7232.511 *	7071.28 *	6850.234 *	6527.699 *	6092.854 *	5583.261 *	5029.326 *	4066.93 *	2547.084 *	882.791 *	14.95	0.5
-11	7803.09 *	7807.958 *	7789.081 *	7773.859 *	7730.924 *	7683.438 *	7615.92 *	7552.79 *	7482.484 *	7390.553 *	7264.025 *	7116.795 *	6961.497 *	6752.084 *	6443.594 *	6026.341 *	5520.071 *	4973.725 *	4027.926 *	2528.7 *	866.998 *	14.963	0.5
-13	7667.2 *	7669.277 *	7651.285 *	7627.606 *	7589.297 *	7546.853 *	7487.959 *	7413.395 *	7349.206 *	7272.789 *	7152.476 *	6993.1 *	6845.202 *	6645.745 *	6357.14 *	5959.014 *	5458.064 *	4912.046 *	3986.639 *	2505.217 *	848.227 *	13.303	0.5
-15	7550.25 *	7550.242 *	7535.198 *	7511.293 *	7475.488 *	7427.258 *	7376.307 *	7303.938 *	7230.67 *	7159.603 *	7054.89 *	6892.949 *	6724.106 *	6537.569 *	6273.618 *	5896.382 *	5381.552 *	4840.251 *	3933.23 *	2476.74 *	826.459 *	12.769	0.5
-17	7463.01 *	7460.172 *	7444.52 *	7420.308 *	7384.886 *	7335.345 *	7282.257 *	7218.805 *	7138.888 *	7056.907 *	6964.509 *	6818.258 *	6633.975 *	6429.143 *	6186.493 *	5836.468 *	5338.051 *	4759.13 *	3878.754 *	2443.489 *	801.683	12.16	0.5
-19.5	7386.36 *	7380.053 *	7363.126 *	7339.942 *	7302.977 *	7254.816 *	7195.542 *	7135.782 *	7063.948 *	6976.795 *	6869.146 *	6741.725 *	6571.665 *	6326.078 *	6081.097 *	5757.256 *	5284.387 *	4717.498 *	3802.31 *	2395.181 *	766.482	11.296	0.5
-22.5	7337.28 *	7328.593 *	7309.424 *	7288.057 *	7250.218 *	7197.037 *	7138.751 *	7075.449 *	7000.632 *	6914.792 *	6804.194 *	6667.652 *	6499.705 *	6275.697 *	5981.089 *	5656.378 *	5217.362 *	4653.216 *	3697.727 *	2330.301 *	721.725	10.112	0.5
-25.5	7287.735 *	7278.442 *	7257.645 *	7233.42 *	7201.12 *	7146.409 *	7085.593 *	7017.842 *	6943.455 *	6864.196 *	6753.238 *	6600.631 *	6434.395 *	6211.619 *	5921.03 *	5560.266 *	5124.154 *	4559.926 *	3566.705 *	2238.944 *	674.299	8.771	0.5
-29	7221.54 *	7211.691 *	7188.131 *	7161.53 *	7131.457 *	7075.986 *	7011.52 *	6941.521 *	6870.613 *	6789.801 *	6670.057 *	6513.242 *	6351.118 *	6136.829 *	5795.011 *	5413.027 *	5018.116 *	4408.862 *	3354.63 *	2124.11 *	612.532	7.014	0.5
-33	6989.94 *	6986.844 *	6966.194 *	6936.735 *	6899.114 *	6856.731 *	6775.414 *	6706.999 *	6641.245 *	6577.039 *	6427.605 *	6234.234 *	6074.321 *	5919.812 *	5506.163 *	5073.554 *	4782.003 *	4145.407 *	3057.205 *	1977.285 *	532.657	4.763	0.5
-37.5	6098.465 *	6109.568 *	6114.311 *	6097.27 *	6073.41 *	5996.325 *	5954.879 *	5906.917 *	5851.453 *	5780.878 *	5669.884 *	5499.173 *	5358.662 *	5215.863 *	4873.512 *	4471.387 *	4174.501 *	3696.136 *	2663.246 *	1705.625 *	435.491	2.383	0.5
-42.5	4721.06 *	4733.837 *	4744.585 *	4734.165 *	4700.995 *	4653.559 *	4617.653 *	4628.414 *	4578.649 *	4523.461 *	4415.901 *	4320.828 *	4247.204 *	4104.219 *	3843.878 *	3602.803 *	3349.36 *	2916.979 *	2176.09 *	1319.759 *	330.686	2.112	0.5
-47.5	3540.59 *	3550.941 *	3559.887 *	3552.83 *	3529.439 *	3490.19 *	3438.556 *	3424.911 *	3399.019 *	3359.329 *	3290.665 *	3185.486 *	3107.746 *	2984.207 *	2824.354 *	2634.464 *	2379.346 *	2081.22 *	1607.188 *	946.569 *	240.171	1.825	0.5
-55	1446.04 *	1461.272 *	1491.718 *	1481.961 *	1474.33 *	1454.579 *	1423.055 *	1406.681 *	1411.852 *	1407.611 *	1389.044 *	1344.289 *	1268.593 *	1256.371 *	1218.32 *	1111.399 *	9						

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	0.1	0	0	0	0	0
65	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.7	0.8	0.7	0.7	1	0.9	0.4	0	0	0	0
55	2.91 *	5.90 *	5.94 *	5.92 *	5.88 *	5.80 *	5.71 *	5.67 *	5.64 *	6.92 *	7.89 *	7.37 *	8.17 *	9	9.1	8.4	6.9	7.8	5.7	1.9	0.2	0	0	0
47.5	5.92 *	11.92 *	11.96 *	11.91 *	11.80 *	11.61 *	11.41 *	11.28 *	11.19 *	13.75 *	15.77 *	14.77 *	16.30 *	17.60 *	17.76 *	16.73 *	13.64 *	15.04 *	10.89 *	3.3	0.4	0	0	0
42.5	5.71 *	11.46 *	11.46 *	11.40 *	11.30 *	11.15 *	11.01 *	10.85 *	10.68 *	13.06 *	15.13 *	14.50 *	16.05 *	16.92 *	17.15 *	16.70 *	13.72 *	15.24 *	11.30 *	3.6	0.4	0	0	0
37.5	7.20 *	14.41 *	14.39 *	14.31 *	14.18 *	14.02 *	13.88 *	13.65 *	13.34 *	16.23 *	18.88 *	18.14 *	20.06 *	21.13 *	21.40 *	20.94 *	17.40 *	19.43 *	14.63 *	4.8	0.6	0	0	0
33	7.91 *	15.84 *	15.81 *	15.73 *	15.59 *	15.42 *	15.21 *	14.92 *	14.60 *	17.85 *	20.78 *	19.77 *	21.71 *	23.13 *	23.56 *	22.74 *	18.80 *	20.97 *	15.85 *	5.29 *	0.6	0	0	0
29	8.21 *	16.43 *	16.38 *	16.28 *	16.13 *	15.91 *	15.67 *	15.43 *	15.11 *	18.34 *	21.32 *	20.50 *	22.41 *	23.53 *	24.21 *	23.41 *	19.02 *	21.14 *	16.08 *	5.41 *	0.7	0	0	0
25.5	7.94 *	15.87 *	15.81 *	15.72 *	15.56 *	15.33 *	15.11 *	14.89 *	14.57 *	17.65 *	20.45 *	19.69 *	21.55 *	22.51 *	23.10 *	22.39 *	18.16 *	20.25 *	15.45 *	5.20 *	0.7	0	0	0
22.5	7.05 *	14.08 *	14.03 *	13.95 *	13.82 *	13.65 *	13.46 *	13.23 *	12.97 *	15.79 *	18.29 *	17.50 *	19.24 *	20.30 *	20.72 *	20.05 *	16.40 *	18.49 *	14.15 *	4.76 *	0.6	0	0	0
19.5	7.12 *	14.23 *	14.18 *	14.10 *	13.97 *	13.81 *	13.62 *	13.38 *	13.12 *	16.00 *	18.55 *	17.73 *	19.55 *	20.75 *	21.13 *	20.43 *	16.94 *	19.25 *	14.75 *	5.01 *	0.7	0	0	0
17	5.96 *	11.90 *	11.87 *	11.80 *	11.69 *	11.56 *	11.40 *	11.21 *	10.99 *	13.41 *	15.54 *	14.86 *	16.41 *	17.44 *	17.76 *	17.20 *	14.41 *	16.42 *	12.59 *	4.35 *	0.6	0	0	0
15	4.78 *	9.54 *	9.51 *	9.46 *	9.38 *	9.27 *	9.14 *	8.99 *	8.82 *	10.76 *	12.47 *	11.93 *	13.19 *	14.01 *	14.27 *	13.84 *	11.65 *	13.31 *	10.24 *	3.58 *	0.5	0	0	0
13	4.78 *	9.56 *	9.53 *	9.48 *	9.40 *	9.29 *	9.16 *	9.01 *	8.84 *	10.78 *	12.50 *	11.97 *	13.24 *	14.07 *	14.31 *	13.90 *	11.73 *	13.43 *	10.37 *	3.65 *	0.5	0	0	0
11	4.80 *	9.60 *	9.57 *	9.51 *	9.43 *	9.33 *	9.20 *	9.05 *	8.87 *	10.82 *	12.55 *	12.03 *	13.30 *	14.11 *	14.35 *	13.96 *	11.82 *	13.54 *	10.46 *	3.70 *	0.5	0	0	0
9	4.83 *	9.64 *	9.61 *	9.56 *	9.48 *	9.37 *	9.24 *	9.09 *	8.91 *	10.88 *	12.63 *	12.10 *	13.35 *	14.16 *	14.42 *	14.05 *	11.90 *	13.62 *	10.53 *	3.75 *	0.5	0	0	0
7	4.86 *	9.71 *	9.68 *	9.62 *	9.54 *	9.44 *	9.31 *	9.15 *	8.97 *	10.96 *	12.71 *	12.16 *	13.42 *	14.24 *	14.52 *	14.15 *	11.96 *	13.68 *	10.58 *	3.79 *	0.5	0	0	0
5	4.90 *	9.79 *	9.76 *	9.70 *	9.62 *	9.51 *	9.38 *	9.22 *	9.04 *	11.03 *	12.79 *	12.22 *	13.49 *	14.32 *	14.60 *	14.22 *	12.01 *	13.72 *	10.61 *	3.83 *	0.5	0	0	0
3	4.94 *	9.86 *	9.82 *	9.77 *	9.68 *	9.57 *	9.44 *	9.28 *	9.10 *	11.10 *	12.85 *	12.29 *	13.57 *	14.40 *	14.67 *	14.28 *	12.04 *	13.74 *	10.64 *	3.85 *	0.6	0	0	0
1	4.96 *	9.89 *	9.86 *	9.81 *	9.72 *	9.61 *	9.48 *	9.32 *	9.13 *	11.14 *	12.90 *	12.34 *	13.63 *	14.46 *	14.72 *	14.32 *	12.06 *	13.74 *	10.63 *	3.86 *	0.6	0	0	0
0	2.48 *	4.96 *	4.94 *	4.91 *	4.87 *	4.82 *	4.75 *	4.67 *	4.57 *	5.58 *	6.46 *	6.19 *	6.83 *	7.25 *	7.38 *	7.17 *	6.03 *	6.86 *	5.30 *	1.93 *	0.3	0	0	0
	2.49 *	4.96 *	4.94 *	4.92 *	4.87 *	4.82 *	4.75 *	4.67 *	4.58 *	5.58 *	6.47 *	6.19 *	6.83 *	7.25 *	7.37 *	7.16 *	6.03 *	6.85 *	5.30 *	1.93 *	0.3	0	0	0

-1	4.97 *	9.92 *	9.89 *	9.83 *	9.75 *	9.64 *	9.50 *	9.33 *	9.15 *	11.15 *	12.92 *	12.35 *	13.63 *	14.45 *	14.70 *	14.27 *	12.00 *	13.67 *	10.60 *	3.87 *	0.6	0	0
-3	4.96 *	9.90 *	9.86 *	9.80 *	9.72 *	9.61 *	9.47 *	9.31 *	9.12 *	11.12 *	12.88 *	12.32 *	13.58 *	14.38 *	14.61 *	14.18 *	11.93 *	13.61 *	10.58 *	3.86 *	0.6	0	0
-5	4.93 *	9.84 *	9.80 *	9.74 *	9.66 *	9.55 *	9.41 *	9.25 *	9.06 *	11.05 *	12.80 *	12.25 *	13.51 *	14.30 *	14.51 *	14.07 *	11.84 *	13.51 *	10.53 *	3.84 *	0.6	0	0
-7	4.88 *	9.74 *	9.70 *	9.65 *	9.56 *	9.45 *	9.31 *	9.15 *	8.97 *	10.92 *	12.66 *	12.14 *	13.40 *	14.19 *	14.39 *	13.94 *	11.73 *	13.40 *	10.47 *	3.82 *	0.5	0	0
-9	4.80 *	9.59 *	9.56 *	9.50 *	9.42 *	9.31 *	9.17 *	9.02 *	8.84 *	10.77 *	12.48 *	11.97 *	13.23 *	14.03 *	14.24 *	13.79 *	11.61 *	13.28 *	10.39 *	3.79 *	0.5	0	0
-11	4.71 *	9.42 *	9.39 *	9.33 *	9.25 *	9.15 *	9.01 *	8.87 *	8.70 *	10.61 *	12.29 *	11.78 *	13.04 *	13.85 *	14.07 *	13.63 *	11.47 *	13.13 *	10.30 *	3.75 *	0.5	0	0
-13	4.64 *	9.26 *	9.23 *	9.18 *	9.10 *	9.00 *	8.87 *	8.72 *	8.57 *	10.45 *	12.11 *	11.59 *	12.83 *	13.66 *	13.92 *	13.49 *	11.33 *	12.97 *	10.19 *	3.70 *	0.5	0	0
-15	4.57 *	9.14 *	9.11 *	9.06 *	8.98 *	8.88 *	8.76 *	8.61 *	8.44 *	10.31 *	11.96 *	11.43 *	12.64 *	13.47 *	13.77 *	13.36 *	11.20 *	12.79 *	10.06 *	3.65 *	0.5	0	0
-17	5.65 *	11.29 *	11.26 *	11.19 *	11.10 *	10.97 *	10.82 *	10.64 *	10.43 *	12.73 *	14.77 *	14.14 *	15.60 *	16.60 *	17.00 *	16.54 *	13.85 *	15.77 *	12.37 *	4.46 *	0.6	0	0
-20	6.73 *	13.43 *	13.39 *	13.31 *	13.19 *	13.04 *	12.86 *	12.65 *	12.40 *	15.11 *	17.54 *	16.80 *	18.53 *	19.66 *	20.10 *	19.60 *	16.44 *	18.62 *	14.52 *	5.19 *	0.7	0	0
-23	6.68 *	13.34 *	13.29 *	13.21 *	13.09 *	12.94 *	12.76 *	12.54 *	12.30 *	14.99 *	17.37 *	16.63 *	18.35 *	19.45 *	19.82 *	19.30 *	16.19 *	18.19 *	14.06 *	4.99 *	0.6	0	0
-26	7.73 *	15.43 *	15.37 *	15.28 *	15.15 *	14.96 *	14.74 *	14.49 *	14.21 *	17.32 *	20.05 *	19.18 *	21.17 *	22.39 *	22.69 *	22.07 *	18.47 *	20.46 *	15.66 *	5.53 *	0.7	0	0
-29	8.66 *	17.28 *	17.21 *	17.10 *	16.95 *	16.73 *	16.46 *	16.19 *	15.89 *	19.33 *	22.31 *	21.30 *	23.55 *	24.81 *	24.88 *	24.22 *	20.27 *	22.04 *	16.71 *	5.88 *	0.7	0	0
-33	8.98 *	17.95 *	17.90 *	17.79 *	17.61 *	17.37 *	17.11 *	16.82 *	16.51 *	20.09 *	23.13 *	22.04 *	24.40 *	25.68 *	25.58 *	24.85 *	20.87 *	22.49 *	16.85 *	5.89 *	0.7	0	0
-38	8.25 *	16.54 *	16.52 *	16.42 *	16.23 *	16.01 *	15.83 *	15.61 *	15.31 *	18.62 *	21.48 *	20.54 *	22.75 *	23.94 *	23.98 *	23.31 *	19.54 *	21.14 *	15.70 *	5.36 *	0.6	0	0
-43	6.30 *	12.64 *	12.63 *	12.55 *	12.41 *	12.23 *	12.09 *	11.95 *	11.73 *	14.27 *	16.46 *	15.76 *	17.43 *	18.35 *	18.53 *	17.97 *	14.89 *	16.28 *	12.12 *	4	0.5	0	0
-48	5.71 *	11.51 *	11.53 *	11.46 *	11.32 *	11.12 *	10.93 *	10.81 *	10.65 *	13.00 *	15.00 *	14.22 *	15.68 *	16.70 *	16.90 *	16.14 *	13.46 *	14.99 *	11.36 *	3.8	0.4	0	0
-55	2.4	5	5.00 *	5	4.9	4.8	4.7	4.7	4.6	5.7	6.6	6.2	6.8	7.5	7.7	7.3	6.4	7.5	6.1	2.3	0.3	0	0
-65	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.9	0.8	0.9	1.1	1.2	1.2	1.2	1.6	1.6	0.7	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	0.4	0.4	0.4	0.5	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	216	432	431	428	424	419	413	407	399	487	563	538	594	630	640	620	519	583	448	157	20.2	0.06	9369.4

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	FFLEDL @ 120W / 4000K	Sample ID.	K1
Temperature (°C)	25.4	Humidity (%RH)	54.0

Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
119.97	60	0.987	117.7	0.994	5.78%
277.05	60	0.483	116.1	0.868	16.18%

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*****