

Photometric Test Report

Relevant Standards

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

Prepared For

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Report Number

DLF2110111-2a

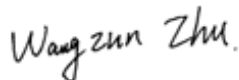
Test Date

2021/10/28

Issue Date

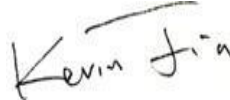
2021/11/1

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		2615
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	145.4
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		18.0
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	2.16%
		20.00%	277V	19.71%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.994
		0.9	277V	0.798
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029±355	5042
		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		0
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%		99.87%
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		0.151
(Goniophotometer - Section 4.2)		Non-Worst Case		0.081
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		18.0
(Goniophotometer - Section 4.2)		Non-Worst Case		17.8

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/10/28	FFLEDS @ 18W / 5000K	B1
2	Goniophotometer Test	2021/10/28	FFLEDS @ 18W / 5000K	B1
3	THD and PF Test	2021/10/28	FFLEDS @ 18W / 5000K	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: FFLEDS @ 18W / 5000K

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.	FFLEDS @ 18W / 5000K	Sample ID.	B1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.4	Humidity (%RH)	54.0

Test Method

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

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

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

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

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

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.04	60	0.151	18.0	0.994
276.99	60	0.081	17.8	0.798

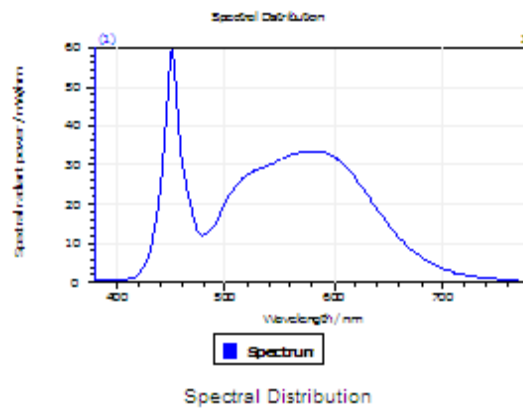
Test Result

CCT (K)	CRI	R9	Duv
5042	82	0	0.0023

Rf	Rg	IES Rcs,h1
83	96	-13%

4.1 Integrating Sphere Test

Results

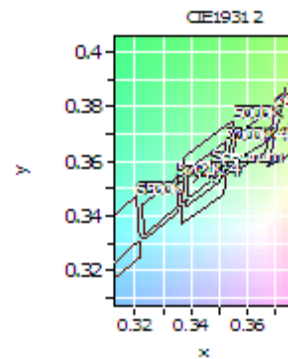


Spectral values

DominantWavelength 569.61 nm
Purity 0.103
PeakWavelength 450.93 nm
Radiant Power 6.509 W
Width50%:

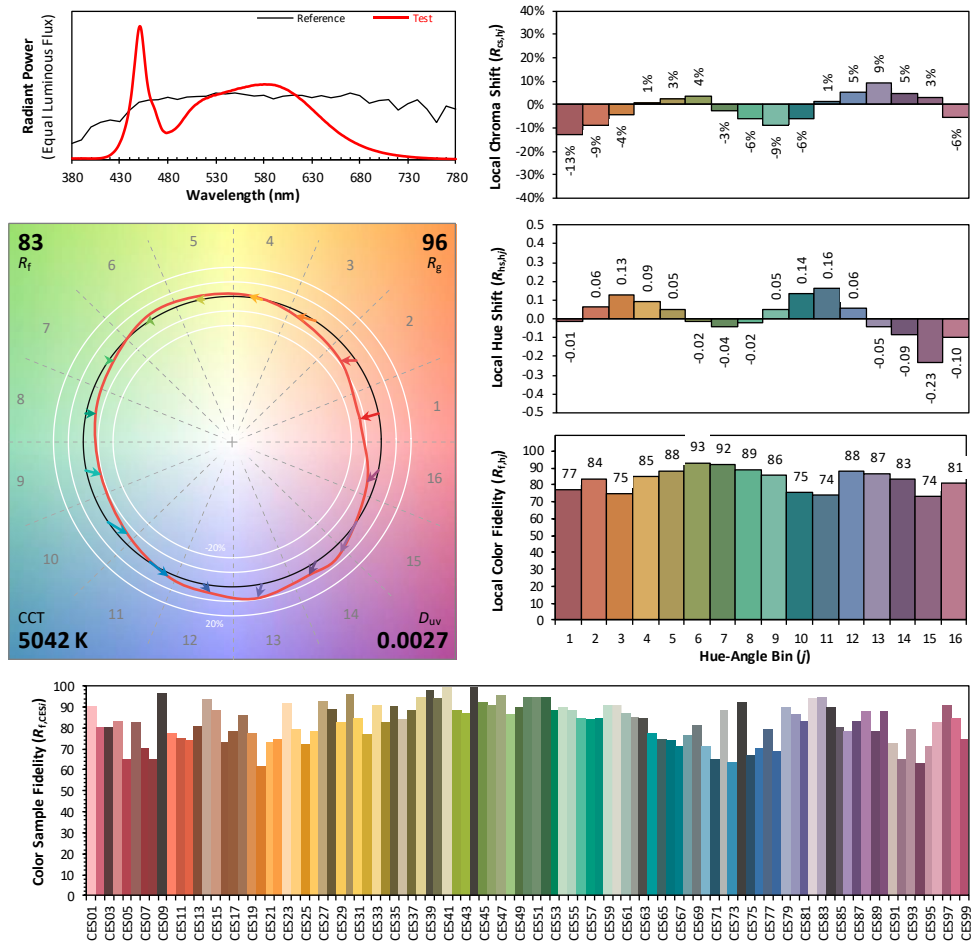
Color Coordinates

Correlated Color Temperat 5042 K
x: 0.3444 u: 0.2091 u': 0.2091
y: 0.3564 v: 0.3246 v': 0.4869
CRI01 79.4 CRI09 -0.1
CRI02 86.9 CRI10 69.3
CRI03 92.2 CRI11 80.5
CRI04 81.3 CRI12 60.2
CRI05 80.5 CRI13 81.2
CRI06 82.2 CRI14 95.9
CRI07 85.6 CRI15 73.1
CRI08 64.4 CRI16 71.8
ResultsCRI 81.6



PlanckDistance 2.6E-003

4.1 Integrating Sphere Test



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

x 0.3444
 y 0.3564
 u' 0.2091
 v' 0.4869

CIE 13.3-1995
(CRI)

R_a 82
 R_9 1

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.	FFLEDS @ 18W / 5000K	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	120.04	60	0.151	18.0	0.993
NON-WORST CASE	277.04	60	0.081	17.8	0.795

Test Result

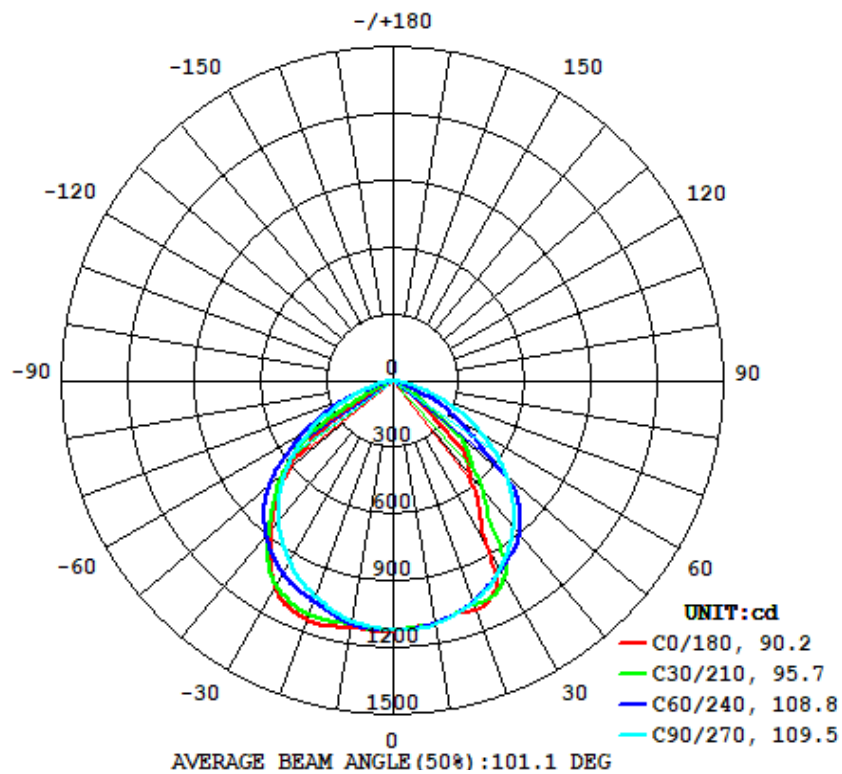
Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
2615	115.4	149.6	90.2	109.5	145.4

Zonal Lumen Requirement (0°-90°)

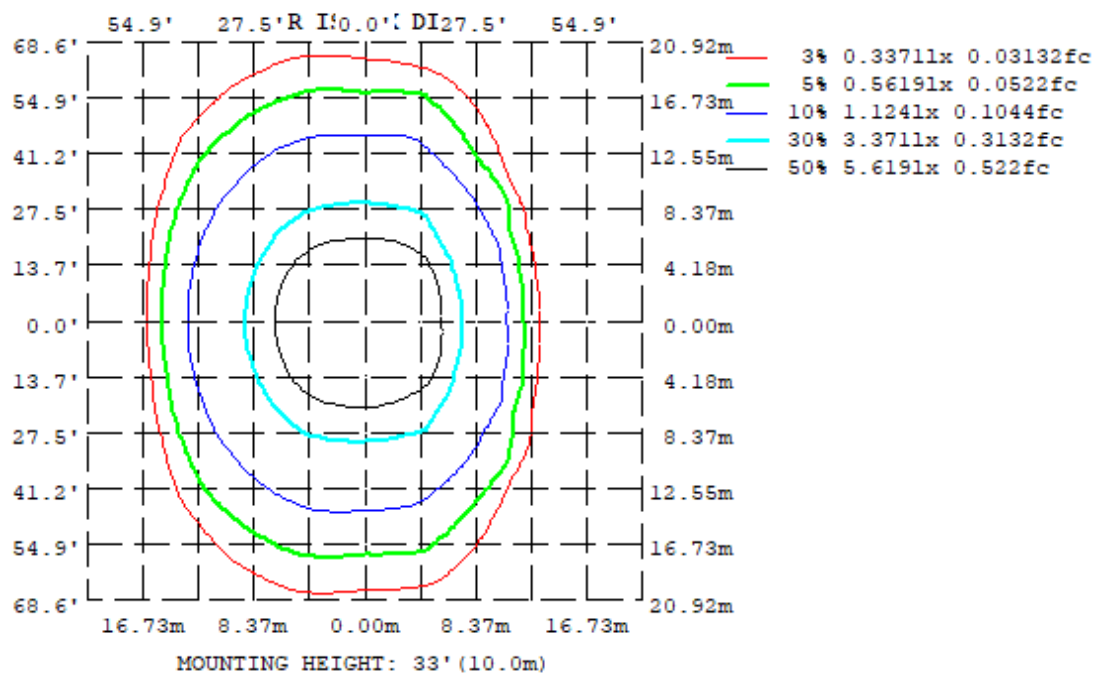
99.87%

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	1104	1103	1108	1118	1124	1110	1097	1099
20	1097	1054	1061	1110	1145	1090	1032	1047
30	847.3	1021	976.0	1068	1070	1042	937.1	1005
40	546.8	765.7	854.2	933.2	856.5	914.7	809.7	683.1
50	218.5	460.7	680.0	704.4	614.1	685.3	641.6	434.5
60	11.22	163.3	464.7	452.7	168.2	452.2	425.6	124.2
70	0.2200	6.006	228.1	55.99	21.31	57.66	198.0	4.061
80	0.1495	0.1828	42.41	8.170	6.231	6.993	24.87	0.0795
90	0.1462	0.2210	0.1622	0.1231	0.0874	0.1716	0.0635	0.0786
100	0.2229	0.2137	0.2142	0.5831	1.891	0.4046	0.2083	0.1757
110	0.2438	0.3749	0.4089	0.2043	0.1123	0.2302	0.3890	0.2809
120	0.4129	0.4863	0.4491	0.3902	0.2290	0.3697	0.4099	0.3807
130	0.6181	0.6066	0.6532	0.5362	0.4031	0.4940	0.6395	0.5478
140	0.7682	0.7649	0.7589	0.6864	0.6539	0.6980	0.7445	0.7529
150	0.8740	0.9098	0.8145	0.8268	0.7887	0.8095	0.8400	0.8937
160	0.9681	0.9485	0.8908	0.8968	0.9889	0.9114	0.8505	0.9505
170	0.9138	0.8545	0.8663	0.8966	0.9563	0.8731	0.7957	0.7979
180	0.9696	0.9019	0.8703	0.9543	0.9665	0.9150	0.8778	0.8989
DEG	LUMINOUS INTENSITY:cd							

	Zonal (lm)		Total (lm)	Percent
0-10	106.68	0 - 10	106.68	4.08%
10-20	310.66	0 - 20	417.35	15.96%
20-30	486.82	0 - 30	904.16	34.57%
30-40	565.41	0 - 40	1469.57	56.20%
40-50	537.45	0 - 50	2007.03	76.75%
50-60	388.39	0 - 60	2395.42	91.60%
60-70	172.81	0 - 70	2568.22	98.21%
70-80	40.70	0 - 80	2608.93	99.76%
80-90	2.71	0 - 90	2611.63	99.87%
90-100	0.67	0 - 100	2612.30	99.89%
100-110	0.28	0 - 110	2612.59	99.90%
110-120	0.33	0 - 120	2612.92	99.92%
120-130	0.43	0 - 130	2613.35	99.93%
130-140	0.51	0 - 140	2613.86	99.95%
140-150	0.50	0 - 150	2614.36	99.97%
150-160	0.41	0 - 160	2614.77	99.99%
160-170	0.26	0 - 170	2615.03	100.00%
170-180	0.08	0 - 180	2615.11	100.00%

4.2 Goniophotometer Test

Axial Candela

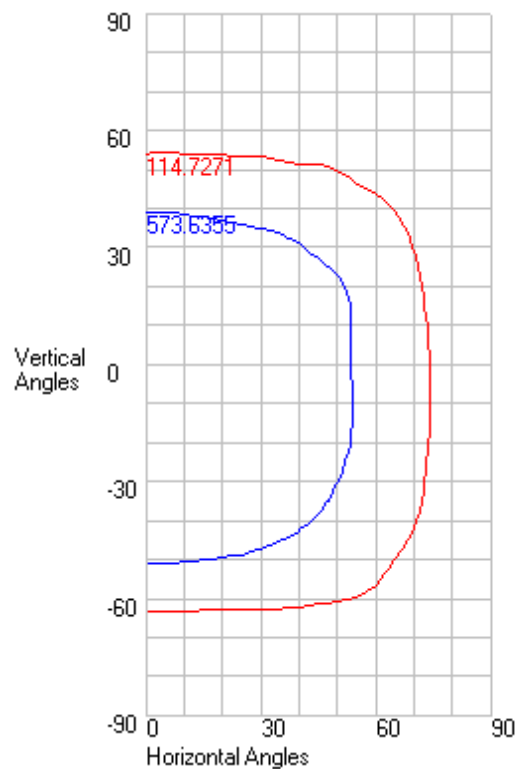
DEG.	HOR.	DEG.	VERT.
90	0.06	90	0.15
85	0.18	85	0.15
75	96.39	75	0.15
65	309.37	65	3.09
55	538.4	55	90.78
47.5	689.16	47.5	295.575
42.5	771.47	42.5	508.47
37.5	845.11	37.5	604.59
33	903.38	33	738.12
29	949.57	29	936.29
25.5	988.86	25.5	1061.975
22.5	1013.035	22.5	1090.525
19.5	1036.12	19.5	1096.13
17	1055.23	17	1086.38
15	1068.89	15	1084.96
13	1081.9	13	1092.2
11	1092.84	11	1100.87
9	1100.88	9	1107.64
7	1106.93	7	1109.7
5	1113.16	5	1111.43
3	1115.98	3	1115.63
1	1120.45	1	1119.3
0	1121.017	0	1121.017
-1	1122.4	-1	1123.31
-3	1123.93	-3	1127.76
-5	1121.28	-5	1127.89
-7	1119.16	-7	1122.87
-9	1112.7	-9	1120.52
-11	1104.76	-11	1128.39
-13	1097.02	-13	1135.93
-15	1087.1	-15	1140.17
-17	1076.83	-17	1145.19
-19.5	1063.395	-19.5	1145.51
-22.5	1042.91	-22.5	1136.12
-25.5	1020.375	-25.5	1120.345
-29	987.55	-29	1085.79
-33	943.26	-33	1011.16
-37.5	889.18	-37.5	909.055
-42.5	816.25	-42.5	807.07
-47.5	725.5	-47.5	695.46
-55	575.84	-55	426.58
-65	344.64	-65	41.51
-75	123.38	-75	10.85
-85	3.58	-85	3.08
-90	0.16	-90	0.091

4.2 Goniophotometer Test

Characteristics

NEMA Type	7 H x 6 V
Maximum Candela	1147.271
Maximum Candela Angle	-5 H -19.5 V
Horizontal Beam Angle (50%)	108.8
Vertical Beam Angle (50%)	90.4
Horizontal Field Angle (10%)	148.7
Vertical Field Angle (10%)	117.6
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	2045
Beam Efficiency	N.A.
Field Lumens	2576
Field Efficiency	N.A.
Spill Lumens	40
Luminaire Lumens	2615
Total Efficiency	N.A.
Total Luminaire Watts	17.9895
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	0.15	0.147	0.14	0.133	0.127	0.12	0.113	0.107	0.1	0.097	0.094	0.09	0.086	0.081	0.08	0.08	0.08	0.08	0.08	0.077	0.07	0.063	0.06
85	0.15	0.147	0.142	0.137	0.131	0.126	0.121	0.115	0.11	0.107	0.104	0.1	0.096	0.091	0.088	0.085	0.082	0.08	0.08	0.077	0.07	0.063	0.06
75	0.15	0.148	0.144	0.14	0.135	0.13	0.125	0.12	0.114	0.109	0.104	0.099	0.095	0.09	0.087	0.084	0.081	0.078	0.073	0.072	0.063	0.061	0.06
65	3.09	3.168	3.324	3.271	3.209	3.058	2.811	2.46	2.24	2.361	2.633	2.887	2.192	1.606	2.209	2.245	1.044	1.752	0.575	1.022	0.2	0.058	0.06
55	90.78	91.944	94.27	93.239	92.292	90.211	86.982	84.86	85.11	84.223	81.415	75.455	68.264	69.102	64.794	52.022	46.962	43.532	21.009	16.163	2.686	0.068	0.06
47.5	295.575 *	300.41 *	306.457 *	306.583 *	299.519 *	290.864 *	281.743 *	288.091 *	298.85 *	304.493 *	288.019 *	248.052 *	252.859 *	269.487 *	241.844 *	191.909 *	189.902 *	170.654 *	97.985	56.127	7.865	0.083	0.06
42.5	508.47 *	508.739 *	508.373 *	506.866 *	504.299 *	500.241 *	495.556 *	492.186 *	484.906 *	478.2 *	468.579 *	457.786 *	440.844 *	409.891 *	390.799 *	368.394 *	282.112 *	268.597 *	163.133 *	90.202	13.473	0.095	0.06
37.5	604.59 *	606.476 *	607.587 *	605.809 *	603.769 *	593.207 *	586.673 *	585.677 *	583.687 *	572.461 *	549.95 *	546.128 *	538.978 *	516.099 *	478.261 *	459.51 *	407.91 *	348.076 *	269.082 *	128.104 *	21.937	0.108	0.06
33	738.12 *	739.624 *	739.515 *	737.06 *	732.014 *	728.91 *	721.911 *	713.406 *	704.589 *	693.636 *	694.597 *	668.669 *	641.436 *	619.714 *	619.596 *	546.96 *	487.236 *	428.812 *	361.473 *	162.25 *	31.959	0.119	0.06
29	936.29 *	943.545 *	945.943 *	939.888 *	925.015 *	911.424 *	905.346 *	903.017 *	883.721 *	843.71 *	834.596 *	855.261 *	793.134 *	731.175 *	730.82 *	704.85 *	562.656 *	507.272 *	421.381 *	188.923 *	41.221	0.129	0.06
25.5	1061.975 *	1062.086 *	1060.943 *	1058.077 *	1053.008 *	1045.649 *	1036.295 *	1025.342 *	1014.617 *	999.116 *	968.983 *	951.044 *	929.588 *	846.754 *	812.969 *	799 *	632.448 *	567.182 *	467.753 *	210.625 *	49.491	0.138	0.06
22.5	1090.525 *	1089.805 *	1087.815 *	1085.551 *	1079.806 *	1072.801 *	1064.48 *	1053.462 *	1040.294 *	1026.755 *	1010.921 *	985.326 *	955.673 *	920.453 *	877.588 *	816.489 *	700.4 *	612.859 *	507.99 *	228.498 *	56.362	0.145	0.06
19.5	1096.13 *	1094.846 *	1092.769 *	1091.444 *	1085.293 *	1079.451 *	1073.71 *	1060.244 *	1048.416 *	1037.075 *	1021.262 *	994.535 *	967.549 *	938.809 *	892.492 *	826.116 *	741.375 *	653.915 *	524.157 *	243.93 *	63.098	0.151	0.06
17	1086.38 *	1085.191 *	1083.798 *	1082.081 *	1077.721 *	1072.121 *	1065.566 *	1055.659 *	1043.558 *	1034.198 *	1019.229 *	994.511 *	970.143 *	941.781 *	895.634 *	831.553 *	757.144 *	685.619 *	533.972 *	256.041 *	68.564	0.156	0.06
15	1084.96 *	1084.443 *	1083.106 *	1080.809 *	1076.184 *	1070.492 *	1063.583 *	1053.157 *	1041.089 *	1032.011 *	1017.472 *	992.751 *	970.126 *	941.763 *	896.333 *	833.786 *	762.528 *	690.525 *	539.541 *	265.196 *	72.725	0.16	0.06
13	1092.2 *	1091.922 *	1089.819 *	1087.067 *	1082.42 *	1076.331 *	1067.989 *	1057.162 *	1046.223 *	1034.852 *	1017.093 *	993.124 *	972.909 *	941.852 *	895.892 *	833.7 *	766.971 *	694.2 *	544.138 *	273.847 *	76.682	0.164	0.06
11	1100.87 *	1100.542 *	1098.268 *	1095.681 *	1091.648 *	1084.38 *	1075.877 *	1065.223 *	1052.809 *	1040.082 *	1021.393 *	999.46 *	977.222 *	942.104 *	894.769 *	835.046 *	768.9 *	696.434 *	545.597 *	281.605 *	80.42	0.172	0.06
9	1107.64 *	1107.576 *	1105.162 *	1102.011 *	1097.149 *	1090.111 *	1082.043 *	1071.844 *	1059.243 *	1044.801 *	1026.197 *	1003.959 *	981.799 *	942.658 *	897.643 *	839.467 *	771.257 *	697.607 *	546.539 *	288.491 *	83.923	0.174	0.06
7	1109.7 *	1108.841 *	1107.468 *	1104.392 *	1099.552 *	1093.235 *	1084.31 *	1075.755 *	1062.228 *	1046.968 *	1028.802 *	1007.397 *	984.964 *	945.965 *	900.277 *	843.571 *	772.934 *	697.519 *	546.498 *	294.529 *	87.178	0.175	0.06
5	1111.43 *	1112.298 *	1107.997 *	1104.832 *	1100.552 *	1093.394 *	1086.503 *	1076.105 *	1063.423 *	1047.828 *	1030.609 *	1010.508 *	987.531 *	948.917 *	902.642 *	845.006 *	773.785 *	696.327 *	545.457 *	299.743 *	91.122	0.177	0.06
3	1115.63 *	1116.787 *	1111.466 *	1108.375 *	1103.308 *	1096.653 *	1087.001 *	1077.559 *	1065.575 *	1051.334 *	1033.681 *	1012.189 *	988.92 *	950.348 *	903.858 *	845.966 *	773.664 *	694.226 *	544.556 *	304.988 *	93.226	0.178	0.06
1	1119.3 *	1119.426 *	1114.298 *	1111.791 *	1106.137 *	1099.958 *	1091.595 *	1081.171 *	1068.44 *	1054.542 *	1035.635 *	1013.038 *	989.181 *	950.419 *	904.018 *	845.705 *	772.484 *	691.119 *	540.454 *	307.908 *	95.335	0.18	0.06
0	1121.017 *	1107.576 *	1105.162 *	1102.011 *	1097.149 *	1090.111 *	1082.043 *	1071.844 *	1059.243 *	1044.801 *	1026.197 *	1003.959 *	981.799 *	942.658 *	897.643 *	839.467 *	771.257 *	697.607 *	546.539 *	288.491 *	83.923	0.174	0.06
-1	1123.31 *	1120.044 *	1116.259 *	1114.627 *	1109.222 *	1103.135 *	1095.009 *	1084.442 *	1071.171 *	1057.506 *	1038.104 *	1014.782 *	990.491 *	951.209 *	904.847 *	846.702 *	773.587 *	691.542 *	541.029 *	311.183 *	96.755	0.189	0.06
-3	1127.76 *	1125.729 *	1119.694 *	1118.886 *	1112.939 *	1106.116 *	1097.725 *	1087.387 *	1073.73 *	1060.088 *	1040.977 *	1017.277 *	992.844 *	952.719 *	906.376 *	848.968 *	776.96 *	695.463 *	546.28 *	314.805 *	97.483	0.206	0.06
-5	1127.89 *	1126.357 *	1120.704 *	1118.576 *	1113.677 *	1107.383 *	1098.555 *	1087.151 *	1074.011 *	1061.001 *	1042.418 *	1018.54 *	994.05 *	952.87 *	906.931 *	850.047 *	779.235 *	698.284 *	548.387 *	316.102 *	98.21	0.224	0.06
-7	1122.87 *	1121.637 *	1117.672 *	1114.316 *	1109.883 *	1103.56 *	1096.039 *	1084.459 *	1072.087 *	1059.475 *	1042.535 *	1018.738 *	993.578 *	951.503 *	906.475 *	850.682 *	780.478 *	700.043 *	550.675 *	317.414 *	97.002	0.242	0.06
-9	1120.52 *	1118.899 *	1116.139 *	1111.676 *	1107.481 *	1100.586 *	1094.955 *	1084.028 *	1069.278 *	1057.65 *	1042.647 *	1020.867 *	995.97 *	950.6 *	905.868 *	848.978 *	780.692 *	700.715 *	552.035 *	317.886 *	96.459	0.259	0.06
-11	1128.39 *	1125.787 *	1122.525 *	1117.401 *	1113.061 *	1105.949 *	1097.343 *	1087.816 *	1074.021 *	1059.106 *	1042.864 *	1023.073 *	997.87 *	954.694 *	906.3 *	847.136 *	780.011 *	700.294 *	552.502 *	317.487 *	95.597	0.276	0.06
-13	1135.93 *	1133.741 *	1130.292 *	1125.475 *	1119.908 *	1111.807 *	1103.389 *	1092.41 *	1079.112 *	1064.514 *	1046.477 *	1024.813 *	999.664 *	958.249 *	910.132 *	847.909 *	779.605 *	698.847 *	552.54 *	316.188 *	94.414	0.28	0.06
-15	1140.17 *	1138.164 *	1134.826 *	1130.283 *	1124.452 *	1117.06 *	1107.422 *	1096.668 *	1083.365 *	1069.077 *	1051.426 *	1028.414 *	1001.108 *	960.794 *	912.378 *	850.033 *	777.206 *	696.184 *	550.177 *	313.965 *	92.913	0.292	0.06
-17	1145.19 *	1143.27 *	1139.794 *	1135.572 *	1128.381 *	1121.581 *	1111.823 *	1099.306 *	1086.185 *	1074.003 *	1054.551 *	1030.78 *	1001.059 *	962.723 *	913.728 *	850.972 *	776.534 *	692.565 *	547.145 *	310.852 *	91.093	0.302	0.06
-19.5	1145.51 *	1144.018 *	1140.873 *	1137.576 *	1130.025 *	1122.162 *	1113.691 *	1100.123 *	1086.954 *	1073.856 *	1056.57 *	1029.401 *	998.462 *	962.565 *	913.474 *	849.738 *	773.714 *	686.94 *	541.44 *	305.737 *	88.374	0.313	0.06
-22.5	1136.12 *	1134.789 *	1131.622 *	1127.795 *	1121.32 *	1113.112 *	1103.841 *	1092.804 *	1079.424 *	1066.422 *	1049.317 *	1023.926 *	990.799 *	955.209 *	908.755 *	844.582 *	767.434 *	676.556 *	531.87 *	298.189 *	84.292	0.322	0.06
-25.5	1120.345 *	1119.217 *	1116.302 *	1112.563 *	1107.077 *	1098.06 *	1087.83 *	1076.769 *	1064.559 *	1051.069 *	1032.504 *	1007.294 *	977.451 *	938.514 *	890.342 *	835.481 *	754.823 *	660.888 *	513.345 *	286.802 *	79.255	0.327	0.06
-29	1085.79 *	1085.607 *	1083.167 *	1079.466 *	1074.601 *	1065.637 *	1055.346 *	1044.139 *	1032.614 *	1017.952 *	996.872 *	974.996 *	950.966 *	910.318 *	857.894 *	806.879 *	733.657 *	635.333 *	489.162 *	272.132 *	72.299	0.328	0.06
-33	1011.16 *	1011.817 *	1010.422 *	1007.023 *	1001.434 *	995.762 *	985.613 *	975.941 *	965.054 *	952.845 *	934.234 *	912.059 *	889.088 *	856.086 *	804.97 *	755.263 *	694.669 *	598.481 *	454.701 *	253.185 *	64.807	0.321	0.06
-37.5	909.055 *	909.248 *	908.102 *	904.901 *	900.847 *	892.773 *	887.047 *	879.709 *	870.163 *	858.577 *	841.587 *	824.859 *	803.677 *	773.715 *	730.504 *	686.096 *	625.442 *	544.466 *	408.74 *	223.623 *	55.642	0.309	0.06
-42.5	807.07 *	806.913 *	805.462 *	802.532 *	798.174 *	791.606 *	785.356 *	779.993 *	766.611 *	755.464 *	742.405 *	728.684 *	707.184 *	678.495 *	642.028 *	601.445 *	546.415 *	473.439 *	357.221 *	181.33 *	44.425	0.285	0.06
-47.5	695.46 *	695.39 *	694.466 *	692.475 *	689.391 *	684.021 *	678.155 *	673.2 *	661.968 *	647.977 *	636.742 *	624.475 *	606.009 *	579.453 *	551.057 *	515.28 *	459.869 *	391.643 *	296.436 *	135.739 *	33.16	0.256	0.06
-55	426.58 *	429.205 *	434.45 *	431.762 *	430.394 *	427.799 *	424.462 *	423.183 *	415.824 *	408.515 *	397.274 *	386.214 *	364.27 *	344.444 *	328.345 *	276.681 *	228.96 *	185.407 *	128.709 *	72.709	17.699	0.195	0.06
-65	41.51	42.04	43.101	43.257	43.381	43.13	42.472	41.38	42.469	44.126	44.863	43.074	40.963	42.611	47.337	42.518	34.388	47.661	28.589	24.731	3.381	0.089	0.06
-75	10.85	10.867	10.902	10.936	10.828	10.763	10.671	10.548	10.451	10.472	10.39	10.22	10.0										

LUMEN TABULATION

	0	1	3	5	7	9	11	13	15	17	20	23	26	29	33	38	43	48	55	65	75	85	90	Total
90																								
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.1	0	0	0
47.5	0.45 *	0.92 *	0.93 *	0.93 *	0.92 *	0.89 *	0.87 *	0.87 *	0.89 *	1.11 *	1.25 *	1.14 *	1.27 *	1.42 *	1.38 *	1.26 *	1.1	1.1	0.8	0.2	0	0	0	0
42.5	0.61 *	1.24 *	1.25 *	1.24 *	1.23 *	1.20 *	1.19 *	1.18 *	1.17 *	1.44 *	1.65 *	1.55 *	1.70 *	1.82 *	1.82 *	1.68 *	1.36 *	1.46 *	1	0.3	0	0	0	0
37.5	0.85 *	1.70 *	1.70 *	1.69 *	1.67 *	1.65 *	1.63 *	1.61 *	1.58 *	1.91 *	2.21 *	2.13 *	2.34 *	2.45 *	2.50 *	2.39 *	1.91 *	2.09 *	1.48 *	0.4	0	0	0	0
33	0.92 *	1.85 *	1.85 *	1.84 *	1.82 *	1.80 *	1.77 *	1.75 *	1.71 *	2.10 *	2.44 *	2.33 *	2.56 *	2.74 *	2.82 *	2.68 *	2.16 *	2.43 *	1.76 *	0.5	0.1	0	0	0
29	1.02 *	2.06 *	2.05 *	2.04 *	2.01 *	1.98 *	1.96 *	1.93 *	1.88 *	2.28 *	2.68 *	2.57 *	2.76 *	2.92 *	3.05 *	2.89 *	2.28 *	2.57 *	1.87 *	0.5	0.1	0	0	0
25.5	1.07 *	2.14 *	2.14 *	2.12 *	2.09 *	2.06 *	2.04 *	2.01 *	1.95 *	2.35 *	2.74 *	2.64 *	2.84 *	2.94 *	3.06 *	2.91 *	2.27 *	2.54 *	1.85 *	0.54 *	0.1	0	0	0
22.5	0.98 *	1.96 *	1.96 *	1.95 *	1.93 *	1.90 *	1.87 *	1.84 *	1.80 *	2.19 *	2.53 *	2.42 *	2.64 *	2.76 *	2.83 *	2.67 *	2.11 *	2.37 *	1.73 *	0.51 *	0.1	0	0	0
19.5	1.00 *	1.99 *	1.99 *	1.97 *	1.95 *	1.93 *	1.90 *	1.87 *	1.83 *	2.23 *	2.58 *	2.46 *	2.71 *	2.87 *	2.91 *	2.76 *	2.24 *	2.51 *	1.83 *	0.54 *	0.1	0	0	0
17	0.83 *	1.66 *	1.65 *	1.64 *	1.63 *	1.61 *	1.59 *	1.56 *	1.53 *	1.87 *	2.16 *	2.06 *	2.27 *	2.41 *	2.45 *	2.34 *	1.93 *	2.17 *	1.57 *	0.48 *	0.1	0	0	0
15	0.66 *	1.32 *	1.32 *	1.31 *	1.30 *	1.28 *	1.26 *	1.24 *	1.22 *	1.49 *	1.73 *	1.65 *	1.82 *	1.94 *	1.96 *	1.89 *	1.57 *	1.77 *	1.28 *	0.40 *	0.1	0	0	0
13	0.66 *	1.32 *	1.32 *	1.31 *	1.30 *	1.29 *	1.27 *	1.24 *	1.22 *	1.49 *	1.73 *	1.65 *	1.83 *	1.94 *	1.97 *	1.89 *	1.59 *	1.79 *	1.30 *	0.41 *	0.1	0	0	0
11	0.67 *	1.33 *	1.33 *	1.32 *	1.31 *	1.29 *	1.27 *	1.25 *	1.23 *	1.50 *	1.74 *	1.66 *	1.84 *	1.94 *	1.97 *	1.90 *	1.60 *	1.80 *	1.31 *	0.42 *	0.1	0	0	0
9	0.67 *	1.34 *	1.34 *	1.33 *	1.32 *	1.30 *	1.28 *	1.26 *	1.24 *	1.51 *	1.74 *	1.67 *	1.84 *	1.95 *	1.97 *	1.91 *	1.61 *	1.81 *	1.32 *	0.43 *	0.1	0	0	0
7	0.68 *	1.35 *	1.34 *	1.34 *	1.32 *	1.31 *	1.29 *	1.27 *	1.24 *	1.51 *	1.75 *	1.68 *	1.85 *	1.96 *	1.99 *	1.92 *	1.61 *	1.81 *	1.33 *	0.43 *	0.1	0	0	0
5	0.68 *	1.35 *	1.35 *	1.34 *	1.33 *	1.31 *	1.29 *	1.27 *	1.25 *	1.52 *	1.76 *	1.68 *	1.86 *	1.96 *	1.99 *	1.93 *	1.62 *	1.81 *	1.34 *	0.44 *	0.1	0	0	0
3	0.68 *	1.36 *	1.35 *	1.34 *	1.33 *	1.31 *	1.30 *	1.27 *	1.25 *	1.52 *	1.76 *	1.69 *	1.86 *	1.97 *	2.00 *	1.93 *	1.62 *	1.82 *	1.35 *	0.45 *	0.1	0	0	0
1	0.68 *	1.36 *	1.35 *	1.35 *	1.34 *	1.32 *	1.30 *	1.28 *	1.25 *	1.53 *	1.77 *	1.69 *	1.87 *	1.97 *	2.00 *	1.94 *	1.62 *	1.81 *	1.35 *	0.45 *	0.1	0	0	0
0	0.34 *	0.68 *	0.68 *	0.68 *	0.67 *	0.66 *	0.65 *	0.64 *	0.63 *	0.76 *	0.89 *	0.85 *	0.93 *	0.99 *	1.00 *	0.97 *	0.81 *	0.90 *	0.67 *	0.23 *	0	0	0	0
	0.34 *	0.68 *	0.68 *	0.68 *	0.67 *	0.66 *	0.65 *	0.64 *	0.63 *	0.77 *	0.89 *	0.85 *	0.94 *	0.99 *	1.00 *	0.97 *	0.81 *	0.91 *	0.67 *	0.23 *	0	0	0	0

-1	0.69 *	1.37 *	1.36 *	1.36 *	1.34 *	1.33 *	1.31 *	1.29 *	1.26 *	1.53 *	1.78 *	1.70 *	1.87 *	1.98 *	2.01 *	1.95 *	1.63 *	1.82 *	1.36 *	0.46 *	0.1	0	0
-3	0.69 *	1.37 *	1.37 *	1.36 *	1.35 *	1.33 *	1.31 *	1.29 *	1.26 *	1.54 *	1.78 *	1.70 *	1.88 *	1.98 *	2.01 *	1.95 *	1.63 *	1.83 *	1.37 *	0.46 *	0.1	0	0
-5	0.69 *	1.37 *	1.36 *	1.36 *	1.34 *	1.33 *	1.31 *	1.29 *	1.26 *	1.54 *	1.78 *	1.70 *	1.87 *	1.98 *	2.02 *	1.96 *	1.64 *	1.84 *	1.37 *	0.46 *	0.1	0	0
-7	0.68 *	1.36 *	1.36 *	1.35 *	1.34 *	1.33 *	1.31 *	1.28 *	1.26 *	1.54 *	1.78 *	1.70 *	1.87 *	1.98 *	2.02 *	1.96 *	1.64 *	1.85 *	1.38 *	0.46 *	0.1	0	0
-9	0.68 *	1.37 *	1.36 *	1.36 *	1.34 *	1.33 *	1.31 *	1.29 *	1.26 *	1.54 *	1.79 *	1.71 *	1.88 *	1.98 *	2.01 *	1.96 *	1.65 *	1.85 *	1.38 *	0.46 *	0.1	0	0
-11	0.69 *	1.38 *	1.37 *	1.36 *	1.35 *	1.33 *	1.32 *	1.29 *	1.27 *	1.54 *	1.79 *	1.71 *	1.89 *	1.99 *	2.02 *	1.96 *	1.65 *	1.85 *	1.38 *	0.46 *	0.1	0	0
-13	0.69 *	1.38 *	1.38 *	1.37 *	1.36 *	1.34 *	1.32 *	1.30 *	1.27 *	1.55 *	1.80 *	1.72 *	1.89 *	2.00 *	2.02 *	1.96 *	1.64 *	1.85 *	1.37 *	0.46 *	0.1	0	0
-15	0.70 *	1.39 *	1.39 *	1.38 *	1.36 *	1.35 *	1.33 *	1.30 *	1.28 *	1.56 *	1.80 *	1.72 *	1.90 *	2.00 *	2.02 *	1.95 *	1.64 *	1.84 *	1.37 *	0.45 *	0.1	0	0
-17	0.87 *	1.74 *	1.74 *	1.72 *	1.71 *	1.69 *	1.66 *	1.63 *	1.60 *	1.95 *	2.25 *	2.15 *	2.37 *	2.50 *	2.53 *	2.44 *	2.04 *	2.29 *	1.69 *	0.56 *	0.1	0	0
-20	1.04 *	2.08 *	2.08 *	2.06 *	2.04 *	2.02 *	1.99 *	1.95 *	1.91 *	2.33 *	2.70 *	2.57 *	2.83 *	2.99 *	3.02 *	2.91 *	2.42 *	2.71 *	2.00 *	0.65 *	0.1	0	0
-23	1.03 *	2.06 *	2.05 *	2.04 *	2.02 *	1.99 *	1.96 *	1.93 *	1.89 *	2.30 *	2.66 *	2.54 *	2.79 *	2.95 *	2.99 *	2.87 *	2.37 *	2.64 *	1.95 *	0.63 *	0.1	0	0
-26	1.18 *	2.35 *	2.34 *	2.33 *	2.30 *	2.27 *	2.24 *	2.20 *	2.15 *	2.62 *	3.03 *	2.89 *	3.18 *	3.34 *	3.39 *	3.26 *	2.68 *	2.96 *	2.17 *	0.70 *	0.1	0	0
-29	1.28 *	2.55 *	2.54 *	2.53 *	2.50 *	2.47 *	2.43 *	2.39 *	2.34 *	2.84 *	3.29 *	3.14 *	3.45 *	3.63 *	3.67 *	3.55 *	2.92 *	3.20 *	2.33 *	0.75 *	0.1	0	0
-33	1.32 *	2.63 *	2.62 *	2.60 *	2.58 *	2.55 *	2.51 *	2.46 *	2.41 *	2.94 *	3.40 *	3.25 *	3.57 *	3.76 *	3.80 *	3.67 *	3.03 *	3.31 *	2.40 *	0.76 *	0.1	0	0
-38	1.31 *	2.61 *	2.60 *	2.59 *	2.56 *	2.53 *	2.49 *	2.45 *	2.39 *	2.91 *	3.37 *	3.22 *	3.53 *	3.73 *	3.76 *	3.62 *	2.99 *	3.27 *	2.33 *	0.71 *	0.1	0	0
-43	1.14 *	2.29 *	2.28 *	2.26 *	2.24 *	2.21 *	2.18 *	2.14 *	2.08 *	2.53 *	2.93 *	2.80 *	3.06 *	3.22 *	3.26 *	3.12 *	2.55 *	2.78 *	1.93 *	0.6	0.1	0	0
-48	1.28 *	2.57 *	2.57 *	2.55 *	2.52 *	2.49 *	2.45 *	2.40 *	2.33 *	2.83 *	3.28 *	3.14 *	3.42 *	3.58 *	3.64 *	3.45 *	2.75 *	3.00 *	2.06 *	0.6	0.1	0	0
-55	0.72 *	1.44 *	1.45 *	1.43 *	1.42 *	1.40 *	1.37 *	1.34 *	1.31 *	1.60 *	1.86 *	1.77 *	1.93 *	2.05 *	2.10 *	1.95 *	1.57 *	1.77 *	1.2	0.4	0	0	0
-65	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	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0	0	0
-75	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	0.1	0.1	0	0	0	0
-85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	30.7	61.5	61.3	60.9	60.3	59.6	58.7	57.7	56.5	68.9	79.8	76.2	83.7	88.4	89.8	86.1	70.9	79	57.5	18.1	2.09	0	1307.6

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	FFLEDS @ 18W / 5000K	Sample ID.	B1
Temperature (°C)	25.4	Humidity (%RH)	54.0

Test Method

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

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

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

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.04	60	0.151	18.0	0.994	2.16%
276.99	60	0.081	17.8	0.798	19.71%

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*****