

Scaled data based on original data using

LM-41-14 Approved Method for Photometric Testing Of Indoor Fluorescent Luminaires

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: io LED

Report Number: P182816

Luminaire Tested: **LDSQA4A13835D010TE LAR25NF 4LSQAL1H 30°**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P182816  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P26803)  
Test Lab: INNOVATION CENTER-P2  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: io LED  
Catalog Number: LDSQA4A13835D010TE LAR25NF 4LSQAL1H 30°  
Description: PORTFOLIO 4" SQUARE LENSED ADJUSTABLE, SELF-FLANGED, 25° NARROW FLOOD, 30° Tilt  
Light Source: (1) HIGH LUMEN LED 80CRI / 3500K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1598.9 lumens  
Efficiency: N/A  
Efficacy: 71.8 lumens/watt  
Spacing Criteria (0/90/45): 2.36 / 0.61 / 1.19  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

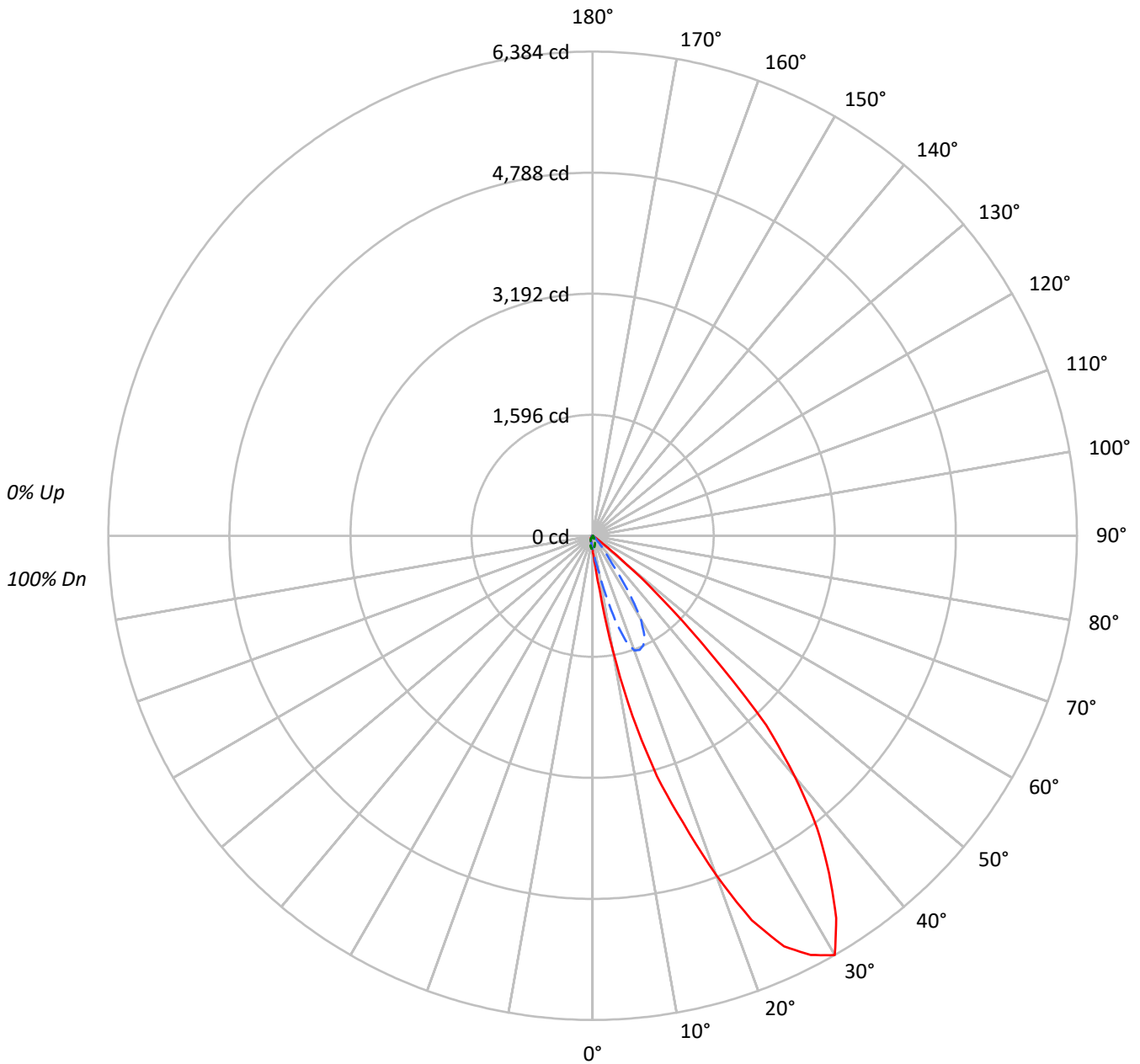
Input Watts (W): 22.27  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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### Luminous Intensity Polar Plot





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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

RF	20									20									20									20									
RC	80									50									30									10									0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0																
RCR																																					
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100																			
1	113	109	106	104	110	107	105	102	103	101	99	99	98	96	96	95	93	91																			
2	106	100	95	91	103	98	94	90	95	91	88	92	89	86	89	87	85	83																			
3	99	91	86	81	97	90	85	80	87	83	79	85	81	78	82	79	76	75																			
4	93	84	77	72	91	83	76	72	80	75	71	78	74	70	76	72	69	67																			
5	87	77	70	65	85	76	69	64	74	68	64	72	67	63	70	66	63	61																			
6	81	70	63	58	79	69	63	58	68	62	57	66	61	57	65	60	57	55																			
7	76	65	57	52	74	64	57	52	62	56	52	61	56	52	60	55	51	50																			
8	71	59	52	47	69	59	52	47	58	51	47	57	51	47	55	50	47	45																			
9	66	55	48	43	65	54	48	43	53	47	43	52	47	43	51	46	42	41																			
10	62	51	44	39	61	50	44	39	49	43	39	48	43	39	48	42	39	37																			

**AVERAGE LUMINANCE (cd/sqm):**

	0°	90°	180°
0°	17263	17263	17263
5°	38645	16240	11631
10°	151549	14214	9158
15°	328981	11514	7973
20°	490783	8526	7196
25°	638348	6007	6264
30°	714105	4038	5481
35°	642653	2377	4648
40°	524463	1619	4059
45°	301132	1096	3302
50°	88076	844	2788
55°	10168	676	2297
60°	2170	775	1860
65°	734	734	1284
70°	680	906	906
75°	599	1198	898
80°	0	1785	893
85°	0	3557	889



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	25.5	1.6
10°-20°	218.9	13.7
20°-30°	522.2	32.7
30°-40°	551.1	34.5
40°-50°	249.9	15.6
50°-60°	21.9	1.4
60°-70°	4.6	0.3
70°-80°	3.0	0.2
80°-90°	1.9	0.1
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	766.6	47.9
0°-40°	1317.6	82.4
0°-60°	1589.4	99.4
0°-90°	1598.9	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1598.9	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	178	178	178	178	178	
5°	397	291	167	128	120	71
15°	3280	1154	115	79	80	954
25°	5972	1588	56	48	59	2713
35°	5434	438	20	27	39	3356
45°	2198	62	8	15	24	1743
55°	60	10	4	9	14	120
65°	3	3	3	6	6	4
75°	2	2	3	4	2	1
85°	0	2	3	2	1	0
90°	0	0	0	0	0	



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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2
2.5°	264.9	266.5	259.3	260.1	252.9	256.1	253.7	247.3	242.4	234.4	231.2
5°	397.4	399.8	383.7	378.9	362.1	362.1	354.8	338.0	322.7	304.3	291.4
7.5°	726.5	736.2	688.0	651.9	598.9	586.0	561.2	503.4	456.0	407.8	371.7
10°	1540.6	1522.9	1423.4	1341.5	1205.0	1154.4	1087.0	920.8	768.3	616.5	497.7
12.5°	2429.3	2486.3	2294.4	2227.8	2011.8	1966.0	1822.3	1551.0	1293.3	1025.2	787.5
15°	3280.2	3297.1	3129.3	3020.9	2757.6	2698.2	2521.6	2202.9	1856.1	1482.0	1153.6
17.5°	3963.4	4030.8	3784.4	3668.0	3326.0	3230.4	3022.5	2634.8	2248.6	1840.0	1450.6
20°	4760.6	4778.2	4486.0	4262.0	3814.9	3669.6	3420.7	2939.8	2479.8	2013.4	1611.2
22.5°	5485.5	5481.5	5105.8	4789.5	4223.5	4050.1	3742.6	3172.6	2638.0	2090.5	1626.5
25°	5972.0	5984.8	5582.6	5208.5	4514.1	4279.7	3932.9	3293.9	2691.8	2088.1	1587.9
27.5°	6231.3	6218.4	5787.3	5387.5	4620.9	4358.4	3981.9	3297.9	2642.8	2006.2	1472.3
30°	6383.8	6212.0	5752.0	5337.0	4548.6	4278.9	3896.0	3171.0	2479.8	1823.1	1266.0
32.5°	5976.0	5909.4	5508.8	5068.0	4299.8	4032.4	3654.3	2901.3	2221.3	1543.0	907.2
35°	5434.1	5436.5	5045.6	4633.7	3909.6	3676.8	3286.6	2573.0	1905.8	1072.5	438.3
37.5°	4865.7	4873.8	4502.1	4119.1	3474.5	3229.6	2864.4	2198.9	1371.2	545.9	264.1
40°	4147.2	4164.1	3843.8	3536.3	2941.4	2705.4	2379.5	1664.2	766.7	305.1	179.0
42.5°	3388.6	3409.5	3125.3	2852.3	2346.6	2152.3	1863.3	1030.8	380.5	197.5	105.2
45°	2198.0	2258.3	2047.1	1932.3	1639.3	1523.7	1216.2	525.8	229.6	115.6	61.8
47.5°	1258.0	1258.8	1080.6	865.4	709.7	617.3	482.5	239.2	134.1	65.0	37.7
50°	584.4	598.9	474.5	395.0	282.6	239.2	196.7	129.2	70.6	37.7	23.3
52.5°	170.2	179.8	163.0	147.7	125.2	111.6	95.5	63.4	36.9	22.5	14.5
55°	60.2	64.2	60.2	56.2	50.6	45.8	40.9	30.5	20.9	13.6	9.6
57.5°	24.9	25.7	24.9	24.1	22.5	22.5	20.1	16.9	12.8	8.8	6.4
60°	11.2	12.0	11.2	12.0	11.2	11.2	11.2	12.0	8.0	5.6	4.8
62.5°	4.8	5.6	5.6	5.6	5.6	6.4	6.4	5.6	4.8	4.0	3.2
65°	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
67.5°	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
70°	2.4	2.4	2.4	2.4	2.4	2.4	1.6	1.6	2.4	2.4	2.4
72.5°	2.4	2.4	2.4	2.4	1.6	1.6	1.6	1.6	1.6	2.4	2.4
75°	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
77.5°	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	1.6	1.6	1.6
80°	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	1.6	1.6	1.6
82.5°	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	1.6	1.6	1.6
85°	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	1.6	1.6	1.6
87.5°	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	1.6	1.6	1.6
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



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**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2
2.5°	227.2	220.0	208.7	201.5	198.3	193.5	190.3	182.2	179.0	172.6	170.2
5°	279.4	264.9	248.1	234.4	225.6	216.0	201.5	185.4	177.4	167.0	161.4
7.5°	338.8	307.5	277.8	253.7	242.4	229.6	211.1	186.2	171.0	157.3	149.3
10°	414.2	350.0	303.5	264.9	248.1	231.2	208.7	179.8	160.6	144.5	135.7
12.5°	590.9	422.3	326.7	271.3	249.7	228.8	200.7	171.0	148.5	130.1	120.4
15°	850.2	590.1	389.4	277.0	244.0	218.4	186.2	156.5	133.3	114.8	105.2
17.5°	1079.8	752.2	476.1	297.8	242.4	206.3	168.6	138.1	115.6	97.9	89.9
20°	1205.0	837.3	533.9	310.7	235.2	187.9	148.5	119.6	97.9	82.7	75.5
22.5°	1207.4	832.5	513.0	282.6	207.1	163.0	128.4	101.2	81.9	68.2	62.6
25°	1135.1	742.6	427.9	222.4	169.4	138.1	107.6	84.3	66.6	56.2	51.4
27.5°	1000.3	603.7	314.7	160.6	132.5	111.6	86.7	67.4	52.2	45.8	41.7
30°	786.7	393.4	183.8	119.6	102.8	85.9	65.8	47.4	40.9	36.1	32.9
32.5°	422.3	191.1	128.4	88.3	73.1	60.2	43.4	34.5	29.7	26.5	25.7
35°	220.8	139.7	85.9	56.2	46.6	39.3	29.7	24.1	21.7	20.1	20.1
37.5°	158.2	87.5	54.6	36.1	30.5	24.9	20.9	17.7	16.1	16.1	16.1
40°	93.9	53.8	32.9	23.3	20.1	17.7	15.3	12.8	12.8	12.8	12.8
42.5°	57.0	33.7	23.3	16.1	14.5	12.8	11.2	10.4	9.6	9.6	10.4
45°	35.3	23.3	15.3	12.0	11.2	9.6	8.8	8.0	8.0	8.0	8.8
47.5°	22.5	16.9	11.2	8.0	7.2	6.4	5.6	5.6	6.4	6.4	7.2
50°	16.9	10.4	7.2	5.6	4.8	4.8	4.0	4.8	4.8	5.6	6.4
52.5°	9.6	6.4	4.8	4.0	4.0	3.2	3.2	4.0	4.0	4.8	5.6
55°	6.4	4.8	4.0	3.2	3.2	3.2	3.2	3.2	4.0	4.0	4.8
57.5°	4.8	4.0	3.2	3.2	3.2	2.4	3.2	3.2	3.2	4.0	4.8
60°	4.0	3.2	3.2	3.2	3.2	2.4	2.4	3.2	3.2	4.0	4.0
62.5°	3.2	3.2	3.2	3.2	3.2	2.4	3.2	3.2	3.2	3.2	4.0
65°	2.4	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	4.0
67.5°	2.4	2.4	3.2	3.2	3.2	2.4	3.2	3.2	3.2	3.2	4.0
70°	2.4	2.4	2.4	3.2	3.2	2.4	3.2	3.2	3.2	3.2	3.2
72.5°	2.4	2.4	2.4	3.2	3.2	2.4	3.2	3.2	3.2	3.2	3.2
75°	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3.2	3.2	3.2
77.5°	2.4	2.4	2.4	2.4	3.2	2.4	3.2	3.2	3.2	3.2	3.2
80°	2.4	2.4	2.4	2.4	2.4	2.4	3.2	3.2	3.2	3.2	3.2
82.5°	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3.2	3.2	3.2	3.2
85°	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3.2	3.2	3.2	3.2
87.5°	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3.2	3.2	3.2
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



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**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2
2.5°	163.8	161.4	156.5	155.7	154.9	151.7	149.3	146.9	146.9	144.5	142.9
5°	151.7	147.7	142.1	139.7	138.9	134.9	131.7	129.2	128.4	126.0	123.6
7.5°	138.9	134.1	127.6	125.2	124.4	120.4	117.2	114.8	113.2	110.8	109.2
10°	125.2	119.6	114.0	111.6	110.8	106.8	104.4	102.0	100.3	98.7	97.1
12.5°	110.8	106.0	100.3	97.9	97.1	93.9	91.5	89.9	89.1	87.5	86.7
15°	96.3	91.5	86.7	85.1	84.3	81.9	80.3	79.5	78.7	78.7	77.9
17.5°	81.9	77.9	73.9	73.1	72.3	70.6	69.8	69.0	69.8	69.8	70.6
20°	68.2	65.0	61.8	61.8	61.0	60.2	60.2	60.2	61.8	62.6	64.2
22.5°	56.2	53.8	51.4	51.4	51.4	51.4	51.4	53.0	54.6	56.2	57.0
25°	46.6	44.2	43.4	43.4	43.4	44.2	45.0	46.6	48.2	49.8	51.4
27.5°	37.7	36.1	36.1	36.1	36.9	37.7	38.5	40.1	42.5	44.2	45.8
30°	30.5	29.7	29.7	30.5	31.3	32.1	33.7	35.3	36.9	38.5	40.1
32.5°	24.1	24.9	24.9	25.7	26.5	27.3	28.9	30.5	32.1	33.7	34.5
35°	20.1	20.1	20.9	21.7	22.5	23.3	24.9	26.5	27.3	28.9	30.5
37.5°	16.1	16.9	17.7	18.5	19.3	20.1	20.9	22.5	23.3	24.9	26.5
40°	13.6	14.5	15.3	16.1	16.1	17.7	17.7	19.3	20.1	21.7	23.3
42.5°	11.2	12.0	12.8	13.6	13.6	14.5	15.3	16.1	17.7	18.5	20.1
45°	8.8	9.6	10.4	11.2	12.0	12.8	12.8	14.5	15.3	16.1	17.7
47.5°	8.0	8.8	9.6	9.6	10.4	11.2	11.2	12.8	13.6	14.5	15.3
50°	6.4	7.2	8.0	8.8	8.8	9.6	10.4	11.2	12.0	12.8	12.8
52.5°	5.6	6.4	7.2	7.2	8.0	8.8	8.8	9.6	10.4	10.4	11.2
55°	5.6	6.4	6.4	7.2	7.2	8.0	8.0	8.8	8.8	9.6	9.6
57.5°	4.8	5.6	5.6	6.4	6.4	7.2	7.2	8.0	8.0	8.0	8.8
60°	4.8	4.8	5.6	5.6	6.4	6.4	6.4	7.2	7.2	7.2	8.0
62.5°	4.0	4.8	4.8	5.6	5.6	5.6	6.4	6.4	6.4	7.2	7.2
65°	4.0	4.8	4.8	5.6	5.6	5.6	5.6	5.6	6.4	6.4	6.4
67.5°	4.0	4.0	4.8	4.8	4.8	4.8	5.6	5.6	5.6	5.6	5.6
70°	4.0	4.0	4.0	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
72.5°	3.2	4.0	4.0	4.0	4.0	4.8	4.8	4.8	4.8	4.8	4.0
75°	3.2	3.2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
77.5°	3.2	3.2	3.2	4.0	4.0	4.0	4.0	4.0	4.0	3.2	3.2
80°	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	2.4
82.5°	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	2.4	2.4	2.4
85°	3.2	2.4	3.2	3.2	3.2	2.4	2.4	2.4	2.4	2.4	1.6
87.5°	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	1.6	1.6
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0





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**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	178.2	178.2	178.2	178.2	178.2	178.2	178.2	178.2
2.5°	141.3	139.7	140.5	140.5	138.9	138.1	138.1	138.9
5°	122.0	120.4	121.2	121.2	119.6	118.8	118.8	119.6
7.5°	107.6	106.0	106.8	106.8	105.2	105.2	105.2	105.2
10°	96.3	95.5	95.5	95.5	93.9	94.7	93.9	93.1
12.5°	85.9	85.9	85.9	85.9	85.1	85.9	85.1	85.1
15°	77.9	77.9	78.7	78.7	78.7	79.5	79.5	79.5
17.5°	71.4	72.3	73.1	73.9	73.9	74.7	74.7	74.7
20°	65.0	66.6	67.4	68.2	68.2	69.8	69.0	69.8
22.5°	58.6	60.2	61.0	61.8	62.6	63.4	63.4	64.2
25°	53.0	54.6	55.4	56.2	57.0	58.6	58.6	58.6
27.5°	47.4	49.0	49.8	51.4	52.2	53.8	53.8	53.8
30°	41.7	43.4	44.2	45.0	46.6	48.2	48.2	49.0
32.5°	36.1	38.5	39.3	40.1	41.7	43.4	44.2	44.2
35°	32.1	33.7	34.5	36.1	36.9	39.3	39.3	39.3
37.5°	28.1	29.7	31.3	32.1	32.9	34.5	35.3	36.1
40°	24.9	26.5	27.3	28.1	29.7	31.3	32.1	32.1
42.5°	21.7	23.3	24.1	24.9	25.7	27.3	27.3	27.3
45°	19.3	20.1	20.9	21.7	22.5	23.3	24.1	24.1
47.5°	16.1	17.7	17.7	18.5	19.3	20.9	20.9	21.7
50°	13.6	15.3	15.3	16.1	16.9	17.7	18.5	18.5
52.5°	12.0	12.8	13.6	13.6	14.5	15.3	16.1	16.1
55°	10.4	11.2	11.2	12.0	12.0	12.8	13.6	13.6
57.5°	8.8	9.6	10.4	10.4	10.4	11.2	11.2	12.0
60°	8.0	8.8	8.8	8.8	8.8	9.6	9.6	9.6
62.5°	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
65°	6.4	6.4	6.4	6.4	5.6	5.6	5.6	5.6
67.5°	5.6	5.6	5.6	5.6	4.8	4.8	4.8	4.8
70°	4.8	4.8	4.8	4.8	4.0	4.0	4.0	3.2
72.5°	4.0	4.0	4.0	4.0	4.0	3.2	3.2	3.2
75°	4.0	3.2	3.2	3.2	3.2	3.2	2.4	2.4
77.5°	3.2	3.2	3.2	2.4	2.4	2.4	2.4	2.4
80°	2.4	2.4	2.4	2.4	2.4	1.6	1.6	1.6
82.5°	2.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6
85°	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8
87.5°	1.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



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— 0°-180°    - - 45°-225°    - - - - 90°-270°















(END OF REPORT)