

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State  
Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: FAIL-SAFE

Report Number: P392498

Luminaire Tested: **MWL-2-18-31-UNV-L840-EDD**

Issue Date: 12/2/2019

**Test Information**

Test Method: LM-79-08  
Report Number: P392498  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1910-565-25 &  
Test Lab: INNOVATION CENTER  
Issue Date: 12/2/2019  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: MWL-2-18-31-UNV-L840-EDD  
Description: MWL 2FT MEDICAL LED FIXTURE  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4941.2 lumens  
Efficiency: N/A  
Efficacy: 100.0 lumens/watt  
Spacing Criteria (0/90/45): 1.16 / 1.18 / 1.25  
Luminous Opening: Rectangular w/ Sides (W: 0.42' x L: 2' x H: 0.42')  
CIE Type: Semi-Direct

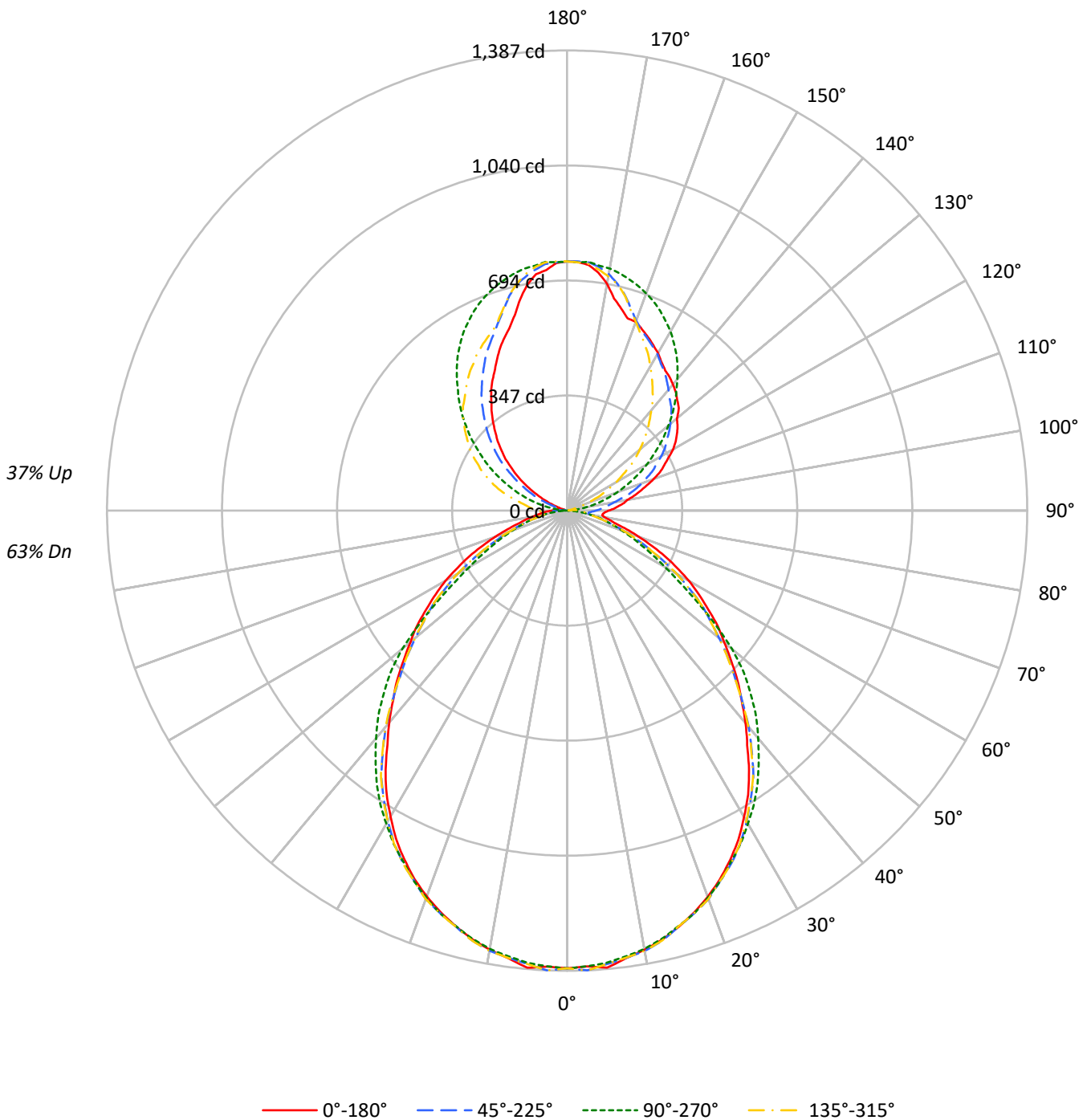
Input Watts (W): 49.4  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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CATALOG NUMBER: MWL-2-18-31-UNV-L840-EDD

### Luminous Intensity Polar Plot





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

RF	20				20				20				20				20	
RC	80				70				50				30				10	0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	110	110	110	110	104	104	104	104	91	91	91	79	79	79	68	68	68	63
1	101	97	93	90	95	91	88	85	80	78	75	70	68	67	61	60	59	54
2	93	85	79	74	87	80	75	70	71	67	63	62	59	57	54	52	50	46
3	85	75	68	62	79	71	65	60	63	58	54	56	52	49	49	46	43	40
4	78	67	59	53	73	63	56	51	56	51	46	50	46	42	44	41	38	35
5	72	60	52	46	67	57	50	44	51	45	40	45	40	37	40	36	33	30
6	66	54	46	40	62	51	44	39	46	40	36	41	36	33	36	32	30	27
7	61	49	41	36	58	47	39	34	42	36	32	37	33	29	33	29	26	24
8	57	45	37	32	54	43	36	31	38	32	28	34	30	26	31	27	24	22
9	53	41	34	29	50	39	32	28	35	30	26	32	27	24	28	24	22	20
10	50	38	31	26	47	36	29	25	33	27	23	29	25	21	26	23	20	18

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

	0°	90°	180°	270°
0°	17821	17821	17821	17821
5°	17612	16313	17612	16313
10°	17006	14960	17006	14960
15°	16450	13675	16429	13675
20°	15828	12507	15807	12507
25°	15097	11354	15076	11354
30°	14195	10308	14167	10308
35°	13151	9285	13129	9285
40°	12009	8211	11979	8211
45°	10993	7148	10969	7148
50°	9952	5942	9926	5942
55°	9001	4411	8983	4411
60°	8051	3221	8041	3221
65°	6857	2392	6857	2392
70°	5503	1775	5515	1775
75°	4242	1239	4284	1239
80°	3863	786	3519	786
85°	4751	328	3243	328



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	130.1	2.6
10°-20°	366.2	7.4
20°-30°	536.8	10.9
30°-40°	608.9	12.3
40°-50°	568.1	11.5
50°-60°	445.6	9.0
60°-70°	278.0	5.6
70°-80°	134.3	2.7
80°-90°	68.0	1.4
90°-100°	69.2	1.4
100°-110°	116.6	2.4
110°-120°	200.1	4.1
120°-130°	271.9	5.5
130°-140°	310.0	6.3
140°-150°	309.0	6.3
150°-160°	269.0	5.4
160°-170°	189.1	3.8
170°-180°	70.4	1.4
0°-30°	1033.1	20.9
0°-40°	1642.0	33.2
0°-60°	2655.6	53.7
0°-90°	3135.9	63.5
90°-120°	385.9	7.8
90°-150°	1276.8	25.8
90°-180°	1805.0	36.5
0°-180°	4941.2	100.0

**CANDELA DISTRIBUTION:**

	0°	90°	180°	270°	360°	Flux
0°	1380	1380	1380	1380	1380	
5°	1383	1368	1383	1368	1383	130
15°	1299	1297	1297	1297	1299	366
25°	1162	1168	1161	1168	1162	534
35°	956	1001	954	1001	956	596
45°	727	783	726	783	727	560
55°	519	476	518	476	519	465
65°	325	246	325	246	325	321
75°	151	118	153	118	151	169
85°	108	28	74	28	108	90
90°	125	2	46	2	125	69
95°	156	22	31	22	156	134
105°	228	105	6	105	228	242
115°	322	215	75	215	322	320
125°	404	336	185	336	404	361
135°	470	460	296	460	470	362
145°	516	574	398	574	516	325
155°	577	664	501	664	577	266
165°	630	722	610	722	630	179
175°	743	752	727	752	743	69
180°	751	751	751	751	751	



TEST NUMBER: P392498

CATALOG NUMBER: MWL-2-18-31-UNV-L840-EDD

**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	1379.7	1379.7	1379.7	1379.7	1379.7	1379.7	1379.7	1379.7	1379.7	1379.7	1379.7
2.5°	1375.1	1383.2	1387.2	1373.8	1374.8	1373.2	1387.2	1383.2	1375.6	1383.2	1387.2
5°	1383.1	1373.2	1372.2	1371.2	1368.2	1371.2	1371.7	1373.2	1383.1	1373.2	1371.7
7.5°	1360.6	1366.7	1359.7	1358.2	1355.2	1357.7	1359.2	1366.2	1360.6	1366.2	1359.2
10°	1344.2	1348.7	1347.7	1340.7	1341.7	1340.2	1347.2	1347.6	1344.2	1347.6	1347.2
12.5°	1324.2	1327.7	1327.2	1319.2	1321.6	1319.2	1327.2	1326.6	1323.2	1326.6	1327.2
15°	1298.8	1298.7	1298.2	1295.2	1296.6	1294.6	1297.6	1297.6	1297.2	1297.6	1297.6
17.5°	1270.8	1273.7	1273.2	1273.6	1273.6	1273.6	1272.6	1273.2	1269.2	1273.2	1272.6
20°	1238.8	1244.2	1246.2	1240.6	1241.1	1240.1	1245.6	1243.2	1237.2	1243.2	1245.6
22.5°	1203.2	1204.2	1207.2	1199.6	1208.1	1199.1	1206.6	1203.2	1202.2	1203.2	1206.6
25°	1162.2	1163.2	1172.7	1168.6	1168.1	1168.1	1171.6	1161.6	1160.6	1161.6	1171.6
27.5°	1118.2	1118.2	1130.7	1127.2	1132.1	1126.6	1129.6	1116.6	1116.6	1116.6	1129.6
30°	1066.2	1075.2	1082.2	1096.7	1090.1	1095.6	1080.6	1073.6	1064.1	1073.6	1080.6
32.5°	1015.2	1020.2	1030.2	1040.7	1048.6	1039.6	1028.6	1018.1	1013.1	1018.1	1028.6
35°	955.7	955.7	978.7	997.7	1001.1	996.1	977.1	954.1	954.1	954.1	977.1
37.5°	891.7	893.7	913.7	942.7	948.6	941.1	912.1	892.1	890.1	892.1	912.1
40°	836.7	832.7	851.7	889.2	895.6	888.1	849.6	830.6	834.6	830.6	849.6
42.5°	778.7	772.7	782.2	828.2	843.6	827.1	780.6	770.6	776.6	770.6	780.6
45°	727.2	715.2	717.2	760.2	782.6	759.1	715.1	713.6	725.6	713.6	715.1
47.5°	670.2	666.2	658.2	686.6	722.6	686.1	656.1	664.6	668.6	664.6	656.1
50°	618.2	610.2	598.2	621.6	648.1	620.6	596.1	608.1	616.6	608.1	596.1
52.5°	572.2	565.2	542.6	556.6	562.1	555.6	541.1	563.1	570.6	563.1	541.1
55°	518.6	517.6	494.6	488.1	475.6	487.1	493.1	516.1	517.6	516.1	493.1
57.5°	470.6	468.6	435.6	424.1	400.6	423.1	434.1	467.1	469.6	467.1	434.1
60°	424.1	417.1	381.1	352.6	340.6	352.1	380.1	416.1	423.6	416.1	380.1
62.5°	372.1	368.1	324.1	293.6	291.1	293.1	323.1	367.1	371.6	367.1	323.1
65°	324.6	309.6	272.6	244.6	246.1	244.1	272.1	309.1	324.6	309.1	272.1
67.5°	273.6	258.6	226.6	201.1	209.1	201.1	226.1	258.1	273.6	258.1	226.1
70°	229.1	209.1	185.1	164.1	176.1	164.1	185.1	209.6	229.6	209.6	185.1
72.5°	188.1	167.1	149.1	134.1	144.5	133.5	149.1	167.6	189.1	167.6	149.1
75°	151.1	132.1	115.5	107.5	117.5	107.5	116.1	132.6	152.6	132.6	116.1
77.5°	131.3	109.2	87.5	83.5	95.5	83.5	88.1	107.6	129.2	107.6	88.1
80°	113.3	98.6	69.1	62.5	70.5	62.5	68.1	90.1	103.2	90.1	68.1
82.5°	107.0	97.2	64.5	44.5	48.5	44.5	58.1	78.2	86.9	78.2	58.1
85°	108.4	102.1	66.1	35.1	27.5	34.1	50.8	69.8	74.0	69.8	50.8
87.5°	114.4	112.7	74.4	35.1	8.0	27.6	44.3	61.9	59.9	61.9	44.3
90°	125.0	124.8	86.5	38.2	1.5	18.1	34.1	50.2	45.7	50.2	34.1
92.5°	142.3	139.0	100.1	45.6	9.5	9.1	27.6	41.1	38.6	41.1	27.6
95°	155.9	152.8	114.8	56.0	22.2	3.1	19.6	30.1	30.6	30.1	19.6
97.5°	172.2	167.6	127.1	75.1	38.6	7.3	10.2	22.1	24.1	22.1	10.2
100°	183.9	180.3	144.9	97.8	58.7	18.5	4.7	14.2	17.2	14.2	4.7
102.5°	207.0	197.7	166.6	119.5	80.3	33.8	8.9	7.2	10.2	7.2	8.9
105°	228.4	221.0	192.5	142.2	105.2	54.4	21.6	8.3	5.7	8.3	21.6
107.5°	251.1	245.8	216.8	165.5	131.7	78.2	40.6	21.6	14.2	21.6	40.6
110°	277.6	271.2	239.5	188.8	159.2	103.6	61.2	38.5	30.0	38.5	61.2



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CATALOG NUMBER: MWL-2-18-31-UNV-L840-EDD

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
112.5°	303.0	298.2	260.7	214.1	187.7	132.1	86.6	59.7	51.7	59.7	86.6
115°	322.5	319.9	285.0	236.9	215.2	163.3	114.7	84.5	75.0	84.5	114.7
117.5°	343.2	342.6	303.0	260.1	246.9	191.4	140.6	109.4	99.3	109.4	140.6
120°	369.1	364.9	327.8	283.4	277.1	221.0	169.1	137.9	127.9	137.9	169.1
122.5°	388.1	384.4	349.0	305.6	305.6	251.1	196.7	165.4	155.9	165.4	196.7
125°	404.5	403.4	365.9	327.8	336.3	279.2	228.3	196.6	185.0	196.6	228.3
127.5°	419.3	420.9	386.5	353.2	368.5	308.7	258.5	223.6	211.4	223.6	258.5
130°	432.0	437.3	406.1	375.4	398.1	339.9	285.5	250.6	242.6	250.6	285.5
132.5°	456.8	453.7	426.2	398.1	429.9	368.5	314.0	277.5	268.5	277.5	314.0
135°	469.5	470.6	443.6	417.7	459.5	397.1	341.0	305.0	296.0	305.0	341.0
137.5°	484.9	481.7	457.4	441.5	487.0	424.6	367.4	334.1	319.8	334.1	367.4
140°	496.0	495.5	475.4	462.7	516.6	451.6	394.4	360.6	347.3	360.6	394.4
142.5°	507.6	510.8	493.3	485.9	546.2	480.1	423.5	386.5	373.8	386.5	423.5
145°	515.6	523.4	511.3	515.0	574.3	511.9	448.9	412.4	397.6	412.4	448.9
147.5°	529.8	538.8	525.5	535.7	598.6	539.9	475.3	438.3	426.1	438.3	475.3
150°	547.8	552.0	544.1	564.2	623.5	571.1	501.2	463.1	451.0	463.1	501.2
152.5°	562.0	567.3	558.3	595.4	643.0	599.7	529.8	487.5	473.2	487.5	529.8
155°	576.9	579.0	572.6	625.6	663.7	627.7	552.5	514.4	500.7	514.4	552.5
157.5°	590.6	594.8	586.4	648.3	681.6	652.0	577.4	541.4	529.3	541.4	577.4
160°	605.4	605.4	608.7	674.8	696.5	673.2	605.0	571.0	554.1	571.0	605.0
162.5°	607.0	617.1	638.8	693.3	710.7	691.7	634.6	592.2	577.4	592.2	634.6
165°	630.3	638.3	672.7	709.7	721.8	708.1	671.1	626.1	609.7	626.1	671.1
167.5°	654.6	672.7	700.2	728.2	732.4	723.4	699.1	667.9	653.0	667.9	699.1
170°	693.3	709.7	723.4	735.1	740.9	735.6	716.6	701.2	691.2	701.2	716.6
172.5°	723.5	735.1	740.4	747.8	744.1	741.9	732.4	725.0	718.7	725.0	732.4
175°	743.1	746.2	750.9	749.3	752.5	746.7	746.2	749.9	727.2	749.9	746.2
177.5°	749.9	753.6	752.0	748.2	748.8	747.7	748.8	749.9	746.8	749.9	748.8
180°	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9



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CATALOG NUMBER: MWL-2-18-31-UNV-L840-EDD

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
0°	1379.7	1379.7	1379.7	1379.7	1379.7	1379.7
2.5°	1373.2	1374.8	1373.8	1387.2	1383.2	1375.1
5°	1371.2	1368.2	1371.2	1372.2	1373.2	1383.1
7.5°	1357.7	1355.2	1358.2	1359.7	1366.7	1360.6
10°	1340.2	1341.7	1340.7	1347.7	1348.7	1344.2
12.5°	1319.2	1321.6	1319.2	1327.2	1327.7	1324.2
15°	1294.6	1296.6	1295.2	1298.2	1298.7	1298.8
17.5°	1273.6	1273.6	1273.6	1273.2	1273.7	1270.8
20°	1240.1	1241.1	1240.6	1246.2	1244.2	1238.8
22.5°	1199.1	1208.1	1199.6	1207.2	1204.2	1203.2
25°	1168.1	1168.1	1168.6	1172.7	1163.2	1162.2
27.5°	1126.6	1132.1	1127.2	1130.7	1118.2	1118.2
30°	1095.6	1090.1	1096.7	1082.2	1075.2	1066.2
32.5°	1039.6	1048.6	1040.7	1030.2	1020.2	1015.2
35°	996.1	1001.1	997.7	978.7	955.7	955.7
37.5°	941.1	948.6	942.7	913.7	893.7	891.7
40°	888.1	895.6	889.2	851.7	832.7	836.7
42.5°	827.1	843.6	828.2	782.2	772.7	778.7
45°	759.1	782.6	760.2	717.2	715.2	727.2
47.5°	686.1	722.6	686.6	658.2	666.2	670.2
50°	620.6	648.1	621.6	598.2	610.2	618.2
52.5°	555.6	562.1	556.6	542.6	565.2	572.2
55°	487.1	475.6	488.1	494.6	517.6	518.6
57.5°	423.1	400.6	424.1	435.6	468.6	470.6
60°	352.1	340.6	352.6	381.1	417.1	424.1
62.5°	293.1	291.1	293.6	324.1	368.1	372.1
65°	244.1	246.1	244.6	272.6	309.6	324.6
67.5°	201.1	209.1	201.1	226.6	258.6	273.6
70°	164.1	176.1	164.1	185.1	209.1	229.1
72.5°	133.5	144.5	134.1	149.1	167.1	188.1
75°	107.5	117.5	107.5	115.5	132.1	151.1
77.5°	83.5	95.5	83.5	87.5	109.2	131.3
80°	62.5	70.5	62.5	69.1	98.6	113.3
82.5°	44.5	48.5	44.5	64.5	97.2	107.0
85°	34.1	27.5	35.1	66.1	102.1	108.4
87.5°	27.6	8.0	35.1	74.4	112.7	114.4
90°	18.1	1.5	38.2	86.5	124.8	125.0
92.5°	9.1	9.5	45.6	100.1	139.0	142.3
95°	3.1	22.2	56.0	114.8	152.8	155.9
97.5°	7.3	38.6	75.1	127.1	167.6	172.2
100°	18.5	58.7	97.8	144.9	180.3	183.9
102.5°	33.8	80.3	119.5	166.6	197.7	207.0
105°	54.4	105.2	142.2	192.5	221.0	228.4
107.5°	78.2	131.7	165.5	216.8	245.8	251.1
110°	103.6	159.2	188.8	239.5	271.2	277.6





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**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
112.5°	132.1	187.7	214.1	260.7	298.2	303.0
115°	163.3	215.2	236.9	285.0	319.9	322.5
117.5°	191.4	246.9	260.1	303.0	342.6	343.2
120°	221.0	277.1	283.4	327.8	364.9	369.1
122.5°	251.1	305.6	305.6	349.0	384.4	388.1
125°	279.2	336.3	327.8	365.9	403.4	404.5
127.5°	308.7	368.5	353.2	386.5	420.9	419.3
130°	339.9	398.1	375.4	406.1	437.3	432.0
132.5°	368.5	429.9	398.1	426.2	453.7	456.8
135°	397.1	459.5	417.7	443.6	470.6	469.5
137.5°	424.6	487.0	441.5	457.4	481.7	484.9
140°	451.6	516.6	462.7	475.4	495.5	496.0
142.5°	480.1	546.2	485.9	493.3	510.8	507.6
145°	511.9	574.3	515.0	511.3	523.4	515.6
147.5°	539.9	598.6	535.7	525.5	538.8	529.8
150°	571.1	623.5	564.2	544.1	552.0	547.8
152.5°	599.7	643.0	595.4	558.3	567.3	562.0
155°	627.7	663.7	625.6	572.6	579.0	576.9
157.5°	652.0	681.6	648.3	586.4	594.8	590.6
160°	673.2	696.5	674.8	608.7	605.4	605.4
162.5°	691.7	710.7	693.3	638.8	617.1	607.0
165°	708.1	721.8	709.7	672.7	638.3	630.3
167.5°	723.4	732.4	728.2	700.2	672.7	654.6
170°	735.6	740.9	735.1	723.4	709.7	693.3
172.5°	741.9	744.1	747.8	740.4	735.1	723.5
175°	746.7	752.5	749.3	750.9	746.2	743.1
177.5°	747.7	748.8	748.2	752.0	753.6	749.9
180°	750.9	750.9	750.9	750.9	750.9	750.9

(END OF REPORT)