

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: HALO COMMERCIAL

Report Number: P345457

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSMMS 3000Lm3000K**

Issue Date: 03/03/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P345457  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-1908-453-8)  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 03/03/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO COMMERCIAL  
Catalog Number: PR4FS24D010 PR4M24WW9FSMMS 3000Lm3000K  
Description: PR4 WALLWASH ASSEMBLY WITH, MATTE METALLIC SILVER FINISH  
Light Source: ARRAY OF HIGH LUMEN LEDs 90CRI / 3000K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1839.2 lumens  
Efficiency: N/A  
Efficacy: 64.5 lumens/watt  
Spacing Criteria (0/90/45): 0.94 / 1.12 / 1.1  
Luminous Opening: Circular (Dia: 0.38' x H: 0')  
CIE Type: Direct

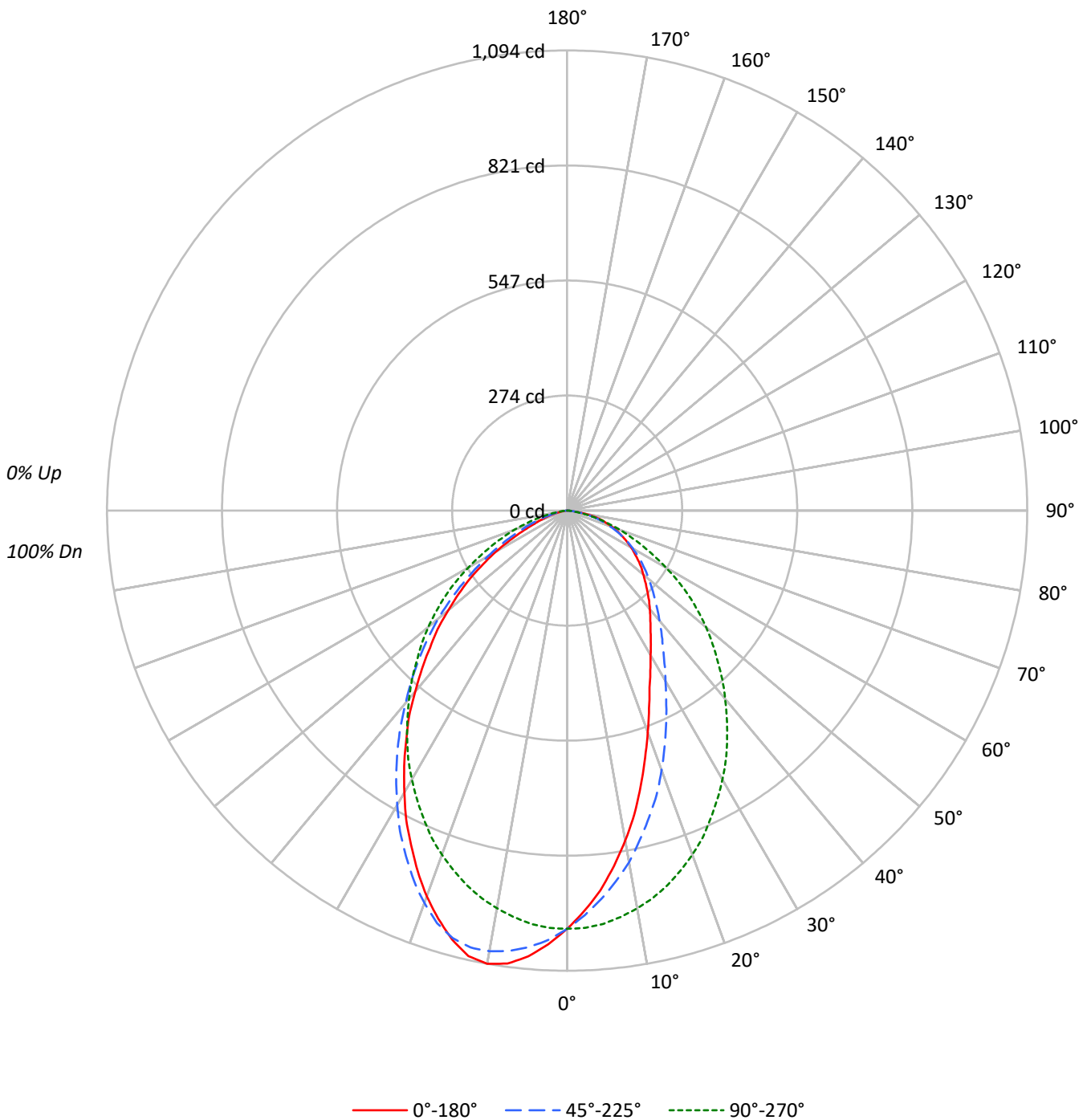
Input Watts (W): 28.5  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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### 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	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					100			
1	111	106	103	100	108	104	101	98	100	97	95	96	94	92	93	91	89					87				
2	102	95	89	84	99	93	87	83	89	85	81	86	82	79	83	80	77					75				
3	94	85	77	72	92	83	76	71	80	75	70	78	73	69	75	71	68					66				
4	87	76	68	62	85	75	67	62	72	66	61	70	65	60	68	63	59					57				
5	80	69	61	55	78	68	60	54	66	59	54	64	58	53	62	57	53					51				
6	75	63	54	49	73	62	54	48	60	53	48	58	52	48	57	51	47					45				
7	70	57	49	44	68	57	49	43	55	48	43	54	47	43	52	47	43					41				
8	65	53	45	39	64	52	45	39	51	44	39	50	43	39	48	43	39					37				
9	61	49	41	36	60	48	41	36	47	40	36	46	40	36	45	39	35					34				
10	58	45	38	33	56	45	38	33	44	37	33	43	37	33	42	37	32					31				

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

	0°	90°	180°
0°	96893	96893	96893
5°	88654	96490	104072
10°	78763	95003	108264
15°	68246	93016	106536
20°	58162	90303	101203
25°	49852	86854	94339
30°	44631	83062	87046
35°	41094	78904	79380
40°	38930	74349	71512
45°	37103	69685	63538
50°	35842	65317	55947
55°	35036	60030	47763
60°	34305	52998	38145
65°	33322	45429	27258
70°	32570	37784	19462
75°	31141	29183	13857
80°	22113	16949	8082
85°	5926	8834	1454



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	93.0	5.1
10°-20°	251.8	13.7
20°-30°	339.3	18.4
30°-40°	356.3	19.4
40°-50°	321.1	17.5
50°-60°	248.0	13.5
60°-70°	152.6	8.3
70°-80°	67.3	3.7
80°-90°	9.9	0.5
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°	684.1	37.2
0°-40°	1040.4	56.6
0°-60°	1609.5	87.5
0°-90°	1839.2	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1839.2	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	994	994	994	994	994	
5°	906	927	986	1042	1064	83
15°	676	754	922	1052	1056	189
25°	464	557	808	906	877	215
35°	345	397	663	704	667	217
45°	269	294	506	498	461	208
55°	206	217	353	303	281	184
65°	144	144	197	146	118	144
75°	83	74	78	46	37	85
85°	5	7	8	4	1	12
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°	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2
2.5°	952.2	950.8	949.5	952.2	952.2	953.5	953.5	956.1	956.1	958.7	962.7
5°	906.2	903.6	904.9	904.9	908.8	908.8	911.4	914.1	918.0	923.3	927.2
7.5°	852.3	852.3	853.7	856.3	860.2	860.2	864.2	868.1	874.7	881.2	889.1
10°	795.9	798.5	799.8	802.4	809.0	811.6	812.9	819.5	828.7	835.3	848.4
12.5°	739.4	739.4	742.0	747.3	752.5	756.5	759.1	768.3	777.5	789.3	801.1
15°	676.4	677.7	681.6	686.9	696.1	698.7	703.9	714.4	727.6	742.0	753.8
17.5°	615.9	618.6	621.2	629.1	635.6	639.6	647.5	659.3	673.7	689.5	707.9
20°	560.8	556.8	562.1	567.4	573.9	583.1	588.4	601.5	617.3	638.3	656.7
22.5°	508.3	508.3	512.2	516.1	522.7	529.3	535.8	546.3	563.4	584.4	605.4
25°	463.6	464.9	468.9	472.8	479.4	483.3	489.9	500.4	517.4	533.2	556.8
27.5°	428.1	429.5	430.8	436.0	441.3	445.2	449.2	459.7	472.8	489.9	509.6
30°	396.6	396.6	397.9	403.2	405.8	411.1	413.7	422.9	434.7	449.2	467.5
32.5°	370.4	370.4	371.7	374.3	379.5	382.2	383.5	392.7	401.9	416.3	430.8
35°	345.4	345.4	346.7	349.3	353.3	354.6	358.5	363.8	373.0	383.5	396.6
37.5°	324.4	324.4	325.7	327.0	329.6	332.3	334.9	340.1	345.4	355.9	369.0
40°	306.0	304.7	306.0	307.3	311.3	311.3	312.6	317.8	323.1	331.0	341.5
42.5°	287.6	287.6	287.6	288.9	291.6	292.9	294.2	296.8	302.1	308.6	316.5
45°	269.2	269.2	270.5	271.9	273.2	274.5	277.1	279.7	282.4	286.3	294.2
47.5°	252.2	253.5	253.5	254.8	256.1	257.4	258.7	261.4	264.0	267.9	273.2
50°	236.4	237.7	237.7	239.0	240.3	240.3	241.7	244.3	246.9	249.5	253.5
52.5°	222.0	222.0	220.6	222.0	223.3	223.3	224.6	225.9	228.5	232.5	235.1
55°	206.2	206.2	206.2	207.5	207.5	207.5	208.8	210.1	211.4	212.8	216.7
57.5°	190.4	190.4	191.7	190.4	191.7	191.7	191.7	193.1	194.4	197.0	198.3
60°	176.0	176.0	176.0	176.0	176.0	176.0	177.3	177.3	177.3	178.6	179.9
62.5°	160.2	160.2	160.2	160.2	160.2	160.2	160.2	160.2	161.5	161.5	162.9
65°	144.5	144.5	145.8	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5
67.5°	130.0	128.7	130.0	128.7	128.7	128.7	128.7	127.4	127.4	127.4	126.1
70°	114.3	112.9	112.9	112.9	112.9	111.6	112.9	111.6	110.3	109.0	107.7
72.5°	97.2	97.2	97.2	97.2	97.2	95.9	94.6	94.6	93.2	91.9	90.6
75°	82.7	82.7	81.4	80.1	78.8	78.8	78.8	77.5	76.2	74.9	73.5
77.5°	64.4	63.0	63.0	61.7	60.4	59.1	60.4	59.1	57.8	56.5	55.2
80°	39.4	39.4	39.4	39.4	39.4	39.4	38.1	39.4	38.1	36.8	36.8
82.5°	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4
85°	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	6.6	6.6
87.5°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	3.9	3.9	3.9
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°	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2
2.5°	965.3	967.9	971.9	974.5	975.8	977.1	981.0	985.0	988.9	992.9	995.5
5°	933.8	940.3	944.3	950.8	954.8	958.7	965.3	971.9	978.4	986.3	992.9
7.5°	895.7	906.2	914.1	923.3	928.5	933.8	943.0	953.5	964.0	974.5	985.0
10°	858.9	868.1	882.5	895.7	899.6	907.5	921.9	933.8	948.2	960.0	974.5
12.5°	816.9	828.7	844.5	860.2	869.4	877.3	894.4	910.1	927.2	943.0	960.0
15°	770.9	789.3	806.4	824.8	836.6	844.5	864.2	883.9	902.2	921.9	941.6
17.5°	725.0	746.0	767.0	789.3	798.5	810.3	832.6	853.7	876.0	897.0	919.3
20°	679.0	701.3	723.6	748.6	761.7	773.5	797.2	822.1	847.1	870.7	894.4
22.5°	630.4	654.0	680.3	707.9	722.3	732.8	760.4	788.0	814.3	841.8	866.8
25°	581.8	609.4	637.0	665.9	680.3	696.1	723.6	752.5	780.1	807.7	836.6
27.5°	534.5	563.4	592.3	625.1	639.6	655.3	685.6	714.4	744.7	773.5	802.4
30°	491.2	518.8	550.3	583.1	598.9	614.6	646.2	677.7	707.9	738.1	765.7
32.5°	451.8	475.4	508.3	541.1	558.2	573.9	606.8	639.6	671.1	702.6	730.2
35°	415.0	437.3	464.9	500.4	516.1	533.2	567.4	598.9	631.7	663.2	692.1
37.5°	382.2	403.2	428.1	458.3	478.0	493.8	528.0	560.8	592.3	623.8	652.7
40°	353.3	371.7	392.7	420.3	438.6	455.7	489.9	522.7	554.2	584.4	613.3
42.5°	327.0	341.5	361.2	386.1	400.6	417.6	453.1	484.6	516.1	546.3	572.6
45°	302.1	313.9	331.0	353.3	365.1	383.5	416.3	447.8	478.0	505.6	534.5
47.5°	279.7	290.2	303.4	321.8	333.6	348.0	380.9	412.4	441.3	468.9	493.8
50°	260.0	267.9	279.7	295.5	304.7	315.2	348.0	378.2	404.5	430.8	454.4
52.5°	240.3	245.6	254.8	267.9	277.1	286.3	313.9	342.8	369.0	391.4	416.3
55°	219.3	225.9	233.8	243.0	249.5	257.4	279.7	307.3	329.6	353.3	373.0
57.5°	200.9	204.9	210.1	218.0	223.3	229.8	246.9	270.5	292.9	312.6	332.3
60°	182.6	185.2	189.1	194.4	198.3	203.6	215.4	236.4	256.1	271.9	288.9
62.5°	164.2	164.2	166.8	170.7	173.4	177.3	187.8	203.6	220.6	232.5	246.9
65°	144.5	145.8	147.1	149.7	151.0	153.7	160.2	172.0	185.2	197.0	207.5
67.5°	126.1	126.1	127.4	128.7	128.7	130.0	134.0	141.8	155.0	162.9	170.7
70°	107.7	107.7	107.7	107.7	109.0	107.7	110.3	115.6	124.8	132.6	136.6
72.5°	90.6	89.3	88.0	88.0	88.0	88.0	89.3	93.2	98.5	102.4	107.7
75°	72.2	70.9	69.6	68.3	69.6	69.6	69.6	70.9	73.5	77.5	78.8
77.5°	53.8	53.8	51.2	49.9	51.2	49.9	48.6	48.6	49.9	51.2	51.2
80°	36.8	35.5	34.1	32.8	32.8	32.8	31.5	30.2	30.2	30.2	28.9
82.5°	18.4	18.4	17.1	17.1	17.1	17.1	17.1	15.8	15.8	14.4	14.4
85°	6.6	6.6	6.6	6.6	7.9	6.6	7.9	7.9	7.9	7.9	7.9
87.5°	3.9	3.9	5.3	5.3	5.3	5.3	5.3	6.6	6.6	6.6	5.3
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°	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2
2.5°	999.4	1003.4	1006.0	1008.6	1009.9	1012.6	1016.5	1019.1	1021.8	1024.4	1027.0
5°	999.4	1007.3	1012.6	1016.5	1020.4	1025.7	1032.3	1037.5	1041.5	1046.7	1050.7
7.5°	995.5	1006.0	1015.2	1020.4	1025.7	1033.6	1041.5	1049.3	1055.9	1062.5	1067.7
10°	987.6	1000.7	1013.9	1019.1	1025.7	1036.2	1046.7	1055.9	1063.8	1071.7	1078.2
12.5°	975.8	991.6	1007.3	1013.9	1020.4	1033.6	1045.4	1055.9	1063.8	1070.4	1074.3
15°	960.0	978.4	995.5	1003.4	1011.3	1024.4	1036.2	1045.4	1052.0	1055.9	1058.5
17.5°	940.3	960.0	978.4	987.6	996.8	1009.9	1019.1	1024.4	1028.3	1028.3	1027.0
20°	918.0	939.0	958.7	967.9	975.8	986.3	992.9	994.2	992.9	990.2	987.6
22.5°	890.4	914.1	933.8	941.6	948.2	956.1	956.1	954.8	952.2	948.2	946.9
25°	861.5	883.9	903.6	911.4	914.1	919.3	915.4	912.8	906.2	902.2	898.3
27.5°	830.0	853.7	868.1	873.4	876.0	873.4	869.4	864.2	860.2	853.7	848.4
30°	795.9	816.9	828.7	832.6	831.3	827.4	823.5	814.3	807.7	801.1	794.6
32.5°	756.5	777.5	786.7	788.0	784.1	777.5	770.9	764.4	756.5	748.6	744.7
35°	718.4	736.8	742.0	739.4	735.5	727.6	718.4	710.5	703.9	694.7	688.2
37.5°	677.7	693.4	693.4	689.5	686.9	677.7	668.5	660.6	651.4	643.5	634.3
40°	637.0	648.8	644.8	640.9	637.0	626.5	618.6	606.8	597.6	588.4	581.8
42.5°	596.2	602.8	597.6	592.3	587.1	576.5	568.7	555.5	547.7	538.5	533.2
45°	555.5	556.8	549.0	545.0	539.8	526.6	516.1	506.9	497.7	487.2	480.7
47.5°	513.5	510.9	501.7	496.4	491.2	479.4	468.9	458.3	447.8	440.0	432.1
50°	471.5	464.9	455.7	450.5	443.9	433.4	421.6	409.8	400.6	392.7	386.1
52.5°	425.5	420.3	409.8	401.9	396.6	382.2	371.7	361.2	350.7	342.8	337.5
55°	379.5	371.7	359.8	354.6	346.7	334.9	324.4	311.3	303.4	296.8	290.2
57.5°	333.6	324.4	313.9	307.3	299.4	287.6	275.8	267.9	260.0	252.2	248.2
60°	288.9	279.7	266.6	264.0	256.1	244.3	233.8	224.6	216.7	211.4	207.5
62.5°	246.9	237.7	224.6	219.3	214.1	202.3	193.1	185.2	179.9	174.7	170.7
65°	204.9	197.0	186.5	179.9	174.7	165.5	157.6	149.7	145.8	139.2	135.3
67.5°	166.8	157.6	149.7	144.5	140.5	131.3	124.8	119.5	114.3	110.3	105.1
70°	131.3	123.5	115.6	112.9	109.0	102.4	97.2	91.9	88.0	84.1	78.8
72.5°	101.1	95.9	88.0	85.4	82.7	77.5	73.5	69.6	64.4	61.7	59.1
75°	74.9	69.6	64.4	61.7	60.4	55.2	52.5	48.6	46.0	44.7	42.0
77.5°	48.6	44.7	42.0	40.7	39.4	36.8	34.1	32.8	30.2	28.9	28.9
80°	27.6	26.3	25.0	23.6	22.3	21.0	21.0	19.7	18.4	17.1	15.8
82.5°	13.1	13.1	11.8	11.8	11.8	10.5	10.5	9.2	9.2	7.9	7.9
85°	6.6	6.6	6.6	6.6	6.6	5.3	5.3	5.3	3.9	3.9	2.6
87.5°	5.3	5.3	5.3	5.3	5.3	3.9	3.9	3.9	2.6	2.6	1.3
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°	994.2	994.2	994.2	994.2	994.2	994.2	994.2	994.2
2.5°	1027.0	1028.3	1029.6	1031.0	1031.0	1032.3	1033.6	1032.3
5°	1053.3	1057.2	1058.5	1059.8	1061.2	1062.5	1063.8	1063.8
7.5°	1073.0	1078.2	1079.5	1079.5	1083.5	1084.8	1086.1	1086.1
10°	1083.5	1086.1	1088.7	1088.7	1091.4	1091.4	1094.0	1094.0
12.5°	1078.2	1080.9	1082.2	1083.5	1083.5	1084.8	1084.8	1084.8
15°	1059.8	1058.5	1058.5	1057.2	1057.2	1055.9	1055.9	1055.9
17.5°	1025.7	1024.4	1023.1	1023.1	1020.4	1020.4	1017.8	1017.8
20°	985.0	982.4	981.0	979.7	979.7	978.4	975.8	975.8
22.5°	941.6	939.0	936.4	933.8	931.1	929.8	928.5	928.5
25°	893.1	889.1	887.8	886.5	882.5	881.2	878.6	877.3
27.5°	843.2	836.6	835.3	834.0	831.3	830.0	828.7	828.7
30°	790.6	786.7	784.1	782.7	778.8	777.5	773.5	773.5
32.5°	738.1	731.5	728.9	727.6	725.0	722.3	721.0	721.0
35°	682.9	679.0	677.7	673.7	669.8	669.8	667.2	667.2
37.5°	630.4	626.5	622.5	621.2	618.6	614.6	613.3	617.3
40°	577.9	572.6	570.0	568.7	566.0	562.1	562.1	562.1
42.5°	526.6	522.7	521.4	518.8	516.1	514.8	512.2	510.9
45°	474.1	471.5	470.2	467.5	466.2	463.6	461.0	461.0
47.5°	428.1	422.9	422.9	420.3	417.6	416.3	416.3	417.6
50°	382.2	378.2	375.6	374.3	371.7	371.7	370.4	369.0
52.5°	332.3	329.6	328.3	328.3	325.7	325.7	324.4	324.4
55°	286.3	286.3	285.0	283.7	281.1	281.1	281.1	281.1
57.5°	245.6	243.0	241.7	240.3	239.0	237.7	237.7	236.4
60°	203.6	202.3	199.6	200.9	197.0	197.0	197.0	195.7
62.5°	165.5	162.9	161.5	160.2	157.6	157.6	155.0	153.7
65°	132.6	128.7	126.1	126.1	123.5	120.8	119.5	118.2
67.5°	99.8	97.2	95.9	94.6	91.9	89.3	89.3	88.0
70°	76.2	73.5	72.2	70.9	69.6	68.3	68.3	68.3
72.5°	56.5	55.2	53.8	53.8	52.5	51.2	51.2	52.5
75°	40.7	39.4	39.4	39.4	38.1	38.1	38.1	36.8
77.5°	27.6	26.3	26.3	25.0	25.0	25.0	25.0	25.0
80°	15.8	14.4	14.4	14.4	14.4	14.4	14.4	14.4
82.5°	6.6	6.6	6.6	6.6	5.3	5.3	5.3	5.3
85°	2.6	2.6	2.6	2.6	2.6	1.3	1.3	1.3
87.5°	1.3	1.3	1.3	1.3	1.3	1.3	0.0	1.3
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)