

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: P345495

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSBZ 3000Lm4000K**

Issue Date: 03/03/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P345495  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-1908-453-9)  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 03/03/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO COMMERCIAL  
Catalog Number: PR4FS24D010 PR4M24WW9FSBZ 3000Lm4000K  
Description: PR4 WALLWASH ASSEMBLY WITH, BRONZE FINISH  
Light Source: ARRAY OF HIGH LUMEN LEDs 90CRI / 4000K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1899.5 lumens  
Efficiency: N/A  
Efficacy: 66.6 lumens/watt  
Spacing Criteria (0/90/45): 0.94 / 1.12 / 1.1  
Luminous Opening: Circular (Dia: 0.4' x H: 0')  
CIE Type: Direct

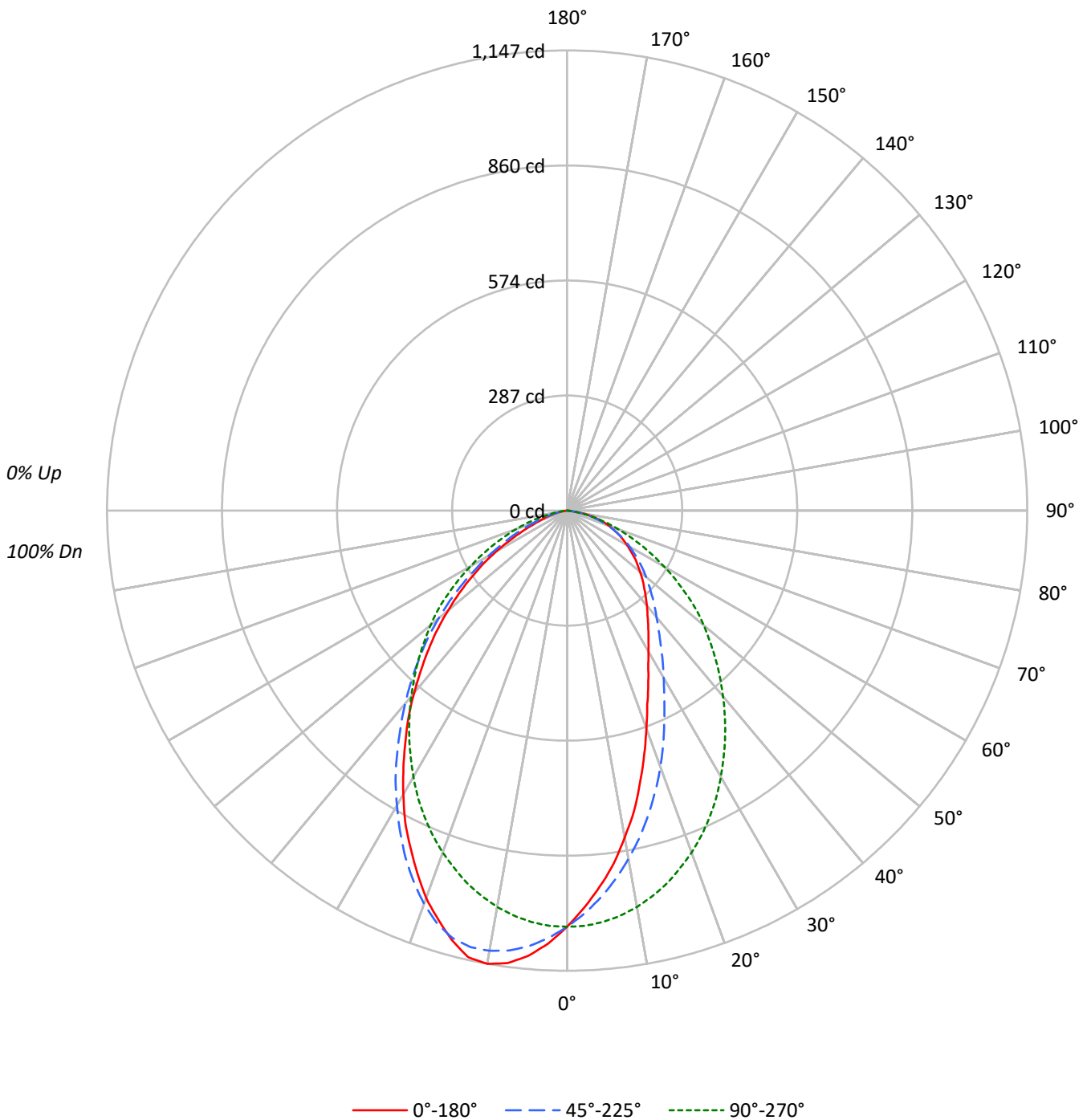
Input Watts (W): 28.5  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	111	107	103	100	108	104	101	98	100	98	95	96	94	92	93	91	90	88
2	102	95	89	84	100	93	88	83	90	85	81	86	83	79	84	80	78	76
3	94	85	78	72	92	83	77	71	80	75	70	78	73	69	75	71	68	66
4	87	76	69	63	85	75	68	62	73	66	61	70	65	61	68	64	60	58
5	81	69	61	55	79	68	60	55	66	59	54	64	58	54	62	57	53	51
6	75	63	55	49	73	62	54	49	60	53	48	59	53	48	57	52	48	46
7	70	58	50	44	68	57	49	44	55	48	43	54	48	43	53	47	43	41
8	65	53	45	40	64	52	45	40	51	44	39	50	44	39	49	43	39	37
9	61	49	41	36	60	48	41	36	47	41	36	46	40	36	45	40	36	34
10	58	46	38	33	57	45	38	33	44	38	33	43	37	33	42	37	33	31

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

	0°	90°	180°
0°	90741	90741	90741
5°	82544	90367	97831
10°	73400	89103	101884
15°	63542	87123	100398
20°	53709	84445	95671
25°	46162	81215	89283
30°	40976	77377	82498
35°	37608	73315	75067
40°	35363	69012	67756
45°	33572	64757	60353
50°	32264	60419	52594
55°	31354	55174	44514
60°	30212	48668	35723
65°	29493	41974	25809
70°	28388	34346	17876
75°	26394	25921	12504
80°	17932	13802	6196
85°	1405	5520	0



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	97.1	5.1
10°-20°	262.8	13.8
20°-30°	353.8	18.6
30°-40°	370.6	19.5
40°-50°	332.4	17.5
50°-60°	254.5	13.4
60°-70°	155.0	8.2
70°-80°	65.8	3.5
80°-90°	7.4	0.4
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°	713.8	37.6
0°-40°	1084.4	57.1
0°-60°	1671.3	88.0
0°-90°	1899.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1899.5	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	1037	1037	1037	1037	1037	
5°	940	968	1029	1090	1114	86
15°	702	784	962	1103	1109	196
25°	478	573	842	954	925	221
35°	352	406	687	739	703	221
45°	271	299	524	521	488	210
55°	206	218	362	317	292	183
65°	142	144	203	151	125	141
75°	78	70	77	47	37	80
85°	1	3	6	1	0	9
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°	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4
2.5°	989.5	990.8	993.6	992.2	995.0	995.0	995.0	997.7	1000.4	1001.8	1004.6
5°	940.1	941.5	942.9	945.6	947.0	945.6	949.7	953.8	958.0	963.4	967.5
7.5°	888.1	888.1	886.7	890.8	896.3	897.7	900.4	904.5	910.0	918.2	926.4
10°	826.4	827.8	830.5	831.9	840.1	841.5	845.6	851.1	860.7	870.2	881.2
12.5°	768.8	767.5	768.8	772.9	778.4	785.3	789.4	796.2	808.6	820.9	834.6
15°	701.7	703.0	707.2	711.3	719.5	723.6	730.5	742.8	755.1	767.5	783.9
17.5°	638.6	637.3	642.7	649.6	656.5	663.3	668.8	679.8	696.2	714.0	731.8
20°	577.0	575.6	579.7	585.2	596.2	600.3	607.1	623.6	638.6	657.8	679.8
22.5°	522.1	522.1	526.3	533.1	540.0	544.1	550.9	564.6	582.4	604.4	626.3
25°	478.3	478.3	481.0	485.1	493.4	497.5	504.3	513.9	530.4	550.9	572.9
27.5°	437.2	439.9	441.3	445.4	452.3	456.4	460.5	471.4	485.1	503.0	523.5
30°	405.7	407.0	408.4	411.1	416.6	419.4	424.8	434.4	446.8	461.8	481.0
32.5°	376.9	378.2	378.2	382.4	386.5	390.6	393.3	401.5	409.8	424.8	442.7
35°	352.2	352.2	355.0	356.3	359.1	361.8	364.5	371.4	381.0	392.0	405.7
37.5°	328.9	328.9	330.3	333.0	335.8	338.5	339.9	345.4	353.6	363.2	374.1
40°	309.7	309.7	309.7	312.5	315.2	316.6	317.9	323.4	330.3	337.1	346.7
42.5°	289.2	290.5	291.9	293.3	294.7	297.4	298.8	301.5	307.0	312.5	322.1
45°	271.4	272.7	272.7	274.1	276.8	276.8	278.2	282.3	286.4	291.9	298.8
47.5°	254.9	254.9	254.9	256.3	257.6	259.0	260.4	263.1	267.2	270.0	276.8
50°	237.1	237.1	238.5	239.8	241.2	241.2	242.6	243.9	248.1	250.8	256.3
52.5°	220.6	220.6	222.0	222.0	223.4	223.4	224.8	227.5	228.9	233.0	237.1
55°	205.6	204.2	205.6	205.6	205.6	206.9	206.9	209.7	212.4	213.8	217.9
57.5°	187.8	189.1	189.1	190.5	190.5	190.5	191.9	191.9	194.6	196.0	197.3
60°	172.7	174.0	174.0	174.0	174.0	174.0	175.4	175.4	176.8	178.2	179.5
62.5°	157.6	157.6	157.6	157.6	157.6	159.0	159.0	159.0	159.0	160.3	161.7
65°	142.5	142.5	142.5	142.5	142.5	142.5	142.5	142.5	142.5	142.5	143.9
67.5°	126.1	126.1	126.1	127.5	126.1	126.1	126.1	126.1	126.1	126.1	124.7
70°	111.0	111.0	111.0	111.0	111.0	109.6	109.6	108.3	108.3	106.9	106.9
72.5°	94.6	94.6	94.6	93.2	93.2	93.2	91.8	90.5	89.1	89.1	89.1
75°	78.1	78.1	76.7	76.7	75.4	75.4	74.0	72.6	71.3	69.9	69.9
77.5°	58.9	58.9	58.9	58.9	57.6	56.2	56.2	54.8	53.4	53.4	52.1
80°	35.6	34.3	34.3	34.3	34.3	34.3	34.3	34.3	34.3	32.9	32.9
82.5°	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
85°	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	2.7
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.4	2.7
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°	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4
2.5°	1007.3	1010.0	1014.1	1016.9	1018.3	1019.6	1023.7	1027.8	1032.0	1036.1	1038.8
5°	974.4	979.9	985.4	992.2	995.0	999.1	1007.3	1014.1	1021.0	1029.2	1036.1
7.5°	934.7	944.3	953.8	964.8	968.9	973.0	984.0	996.3	1005.9	1018.3	1029.2
10°	893.5	904.5	916.8	931.9	938.8	945.6	959.3	974.4	988.1	1003.2	1016.9
12.5°	846.9	864.8	881.2	897.7	904.5	912.7	930.5	948.4	966.2	984.0	1000.4
15°	800.4	818.2	838.7	857.9	867.5	878.5	899.0	921.0	941.5	962.1	981.3
17.5°	753.8	771.6	793.5	818.2	830.5	841.5	863.4	888.1	912.7	934.7	959.3
20°	701.7	725.0	751.0	777.1	789.4	803.1	829.1	855.2	882.6	907.2	933.3
22.5°	651.0	675.6	707.2	733.2	746.9	760.6	790.8	820.9	848.3	875.7	901.8
25°	600.3	629.0	659.2	690.7	705.8	720.9	752.4	781.2	812.7	841.5	871.6
27.5°	550.9	581.1	612.6	645.5	661.9	678.4	709.9	742.8	774.3	805.8	836.0
30°	504.3	533.1	567.4	601.6	618.1	635.9	668.8	703.0	734.6	766.1	799.0
32.5°	463.2	487.9	522.1	556.4	574.2	592.0	627.7	661.9	693.5	726.3	760.6
35°	424.8	448.1	478.3	513.9	531.7	549.6	585.2	620.8	655.1	686.6	719.5
37.5°	392.0	412.5	438.5	470.1	490.6	508.4	544.1	579.7	612.6	645.5	677.0
40°	360.4	378.2	402.9	433.1	449.5	467.3	503.0	540.0	572.9	604.4	635.9
42.5°	333.0	348.1	368.7	394.7	412.5	427.6	464.6	500.2	531.7	563.3	594.8
45°	308.4	320.7	337.1	359.1	374.1	393.3	427.6	460.5	492.0	523.5	553.7
47.5°	283.7	294.7	308.4	328.9	341.2	356.3	390.6	422.1	453.6	482.4	511.2
50°	263.1	271.4	282.3	298.8	311.1	322.1	353.6	386.5	415.3	444.0	470.1
52.5°	242.6	248.1	257.6	272.7	280.9	291.9	319.3	349.5	378.2	405.7	429.0
55°	222.0	227.5	234.3	245.3	253.5	261.8	285.1	313.8	339.9	361.8	385.1
57.5°	201.5	205.6	211.1	220.6	226.1	233.0	252.2	275.5	298.8	320.7	338.5
60°	183.6	186.4	190.5	196.0	200.1	204.2	217.9	239.8	261.8	278.2	294.7
62.5°	163.1	164.5	167.2	172.7	175.4	178.2	187.8	206.9	224.8	239.8	253.5
65°	143.9	145.3	146.6	149.4	152.1	153.5	161.7	175.4	190.5	202.8	212.4
67.5°	124.7	126.1	126.1	128.8	128.8	131.6	135.7	143.9	157.6	167.2	175.4
70°	105.5	106.9	106.9	108.3	106.9	108.3	112.4	117.9	126.1	134.3	139.8
72.5°	87.7	86.3	86.3	86.3	86.3	87.7	89.1	91.8	98.7	105.5	106.9
75°	68.5	68.5	67.2	67.2	67.2	67.2	67.2	68.5	72.6	76.7	78.1
77.5°	50.7	49.3	49.3	48.0	48.0	48.0	46.6	46.6	48.0	50.7	50.7
80°	32.9	31.5	30.2	31.5	28.8	30.2	28.8	27.4	27.4	27.4	26.0
82.5°	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	12.3	12.3	12.3
85°	2.7	2.7	4.1	4.1	4.1	4.1	4.1	4.1	5.5	5.5	4.1
87.5°	2.7	2.7	2.7	4.1	4.1	4.1	4.1	4.1	5.5	5.5	5.5
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°	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4
2.5°	1042.9	1047.0	1051.1	1052.5	1053.9	1058.0	1060.7	1064.9	1066.2	1069.0	1071.7
5°	1042.9	1051.1	1058.0	1062.1	1064.9	1071.7	1078.6	1082.7	1089.5	1093.6	1097.7
7.5°	1040.2	1051.1	1060.7	1066.2	1071.7	1079.9	1089.5	1097.7	1106.0	1111.4	1118.3
10°	1032.0	1045.7	1058.0	1064.9	1071.7	1084.0	1095.0	1104.6	1114.2	1122.4	1129.3
12.5°	1019.6	1036.1	1051.1	1059.4	1066.2	1081.3	1093.6	1104.6	1114.2	1121.0	1126.5
15°	1001.8	1022.4	1040.2	1048.4	1056.6	1073.1	1085.4	1095.0	1103.2	1107.3	1111.4
17.5°	981.3	1003.2	1023.7	1033.3	1041.6	1056.6	1067.6	1074.4	1078.6	1081.3	1079.9
20°	958.0	981.3	1001.8	1011.4	1021.0	1033.3	1041.6	1044.3	1042.9	1041.6	1038.8
22.5°	929.2	953.8	975.8	984.0	992.2	1001.8	1004.6	1003.2	1000.4	997.7	993.6
25°	899.0	923.7	944.3	951.1	958.0	962.1	960.7	958.0	953.8	949.7	942.9
27.5°	864.8	890.8	907.2	915.5	916.8	916.8	912.7	908.6	901.8	896.3	889.4
30°	829.1	851.1	867.5	870.2	871.6	868.9	864.8	857.9	848.3	844.2	837.4
32.5°	788.0	811.3	823.7	823.7	820.9	816.8	808.6	801.7	796.2	786.6	779.8
35°	749.6	767.5	774.3	774.3	770.2	763.3	756.5	746.9	738.7	733.2	723.6
37.5°	705.8	723.6	726.3	722.2	719.5	711.3	700.3	692.1	682.5	675.6	668.8
40°	664.7	677.0	674.3	670.2	667.4	659.2	646.9	637.3	627.7	619.5	612.6
42.5°	618.1	626.3	622.2	619.5	614.0	604.4	593.4	583.8	574.2	566.0	559.2
45°	575.6	579.7	572.9	567.4	563.3	552.3	544.1	530.4	520.8	512.6	507.1
47.5°	530.4	530.4	523.5	518.0	511.2	500.2	490.6	476.9	471.4	460.5	455.0
50°	486.5	482.4	474.2	467.3	461.8	449.5	437.2	427.6	418.0	409.8	404.3
52.5°	439.9	434.4	423.5	416.6	413.9	398.8	387.8	375.5	367.3	357.7	352.2
55°	393.3	385.1	372.8	367.3	361.8	349.5	337.1	324.8	316.6	309.7	304.2
57.5°	345.4	335.8	324.8	317.9	311.1	298.8	286.4	275.5	268.6	261.8	257.6
60°	296.0	289.2	278.2	271.4	264.5	253.5	239.8	231.6	226.1	217.9	216.5
62.5°	253.5	243.9	231.6	226.1	220.6	209.7	198.7	191.9	185.0	180.9	175.4
65°	211.1	201.5	190.5	185.0	180.9	171.3	163.1	156.2	150.8	145.3	141.2
67.5°	169.9	163.1	153.5	149.4	143.9	135.7	128.8	123.3	117.9	112.4	108.3
70°	135.7	127.5	119.2	116.5	113.7	105.5	100.0	94.6	89.1	85.0	80.9
72.5°	104.2	97.3	90.5	86.3	83.6	79.5	75.4	69.9	65.8	61.7	58.9
75°	74.0	69.9	64.4	61.7	58.9	56.2	50.7	48.0	46.6	43.9	41.1
77.5°	48.0	43.9	41.1	38.4	38.4	35.6	32.9	31.5	28.8	28.8	27.4
80°	24.7	23.3	21.9	21.9	21.9	19.2	17.8	17.8	16.4	15.1	15.1
82.5°	11.0	11.0	9.6	9.6	9.6	8.2	8.2	6.9	6.9	5.5	5.5
85°	4.1	4.1	4.1	4.1	4.1	2.7	2.7	2.7	1.4	1.4	1.4
87.5°	4.1	4.1	4.1	4.1	4.1	2.7	2.7	2.7	1.4	1.4	1.4
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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CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSBZ 3000Lm4000K

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4	1037.4
2.5°	1073.1	1075.8	1075.8	1077.2	1078.6	1079.9	1078.6	1079.9
5°	1101.9	1106.0	1107.3	1107.3	1110.1	1111.4	1114.2	1114.2
7.5°	1123.8	1127.9	1130.6	1132.0	1134.7	1137.5	1137.5	1137.5
10°	1134.7	1138.9	1140.2	1143.0	1144.3	1145.7	1147.1	1147.1
12.5°	1130.6	1134.7	1136.1	1136.1	1138.9	1138.9	1138.9	1140.2
15°	1112.8	1111.4	1111.4	1111.4	1110.1	1110.1	1110.1	1108.7
17.5°	1077.2	1075.8	1075.8	1075.8	1074.4	1073.1	1071.7	1069.0
20°	1037.4	1034.7	1032.0	1033.3	1030.6	1029.2	1027.8	1027.8
22.5°	990.8	986.7	985.4	984.0	981.3	979.9	977.1	977.1
25°	940.1	937.4	933.3	931.9	930.5	927.8	925.1	925.1
27.5°	886.7	882.6	881.2	878.5	877.1	874.4	873.0	874.4
30°	831.9	827.8	826.4	823.7	818.2	820.9	818.2	816.8
32.5°	774.3	770.2	767.5	764.7	764.7	760.6	760.6	759.2
35°	718.1	714.0	711.3	709.9	707.2	707.2	704.4	703.0
37.5°	663.3	659.2	656.5	655.1	652.3	649.6	648.2	649.6
40°	607.1	603.0	600.3	598.9	596.2	593.4	593.4	593.4
42.5°	552.3	548.2	548.2	545.4	541.3	540.0	538.6	538.6
45°	501.6	496.1	494.7	492.0	492.0	489.3	487.9	487.9
47.5°	448.1	444.0	442.7	441.3	439.9	438.5	438.5	438.5
50°	398.8	393.3	393.3	390.6	389.2	390.6	387.8	386.5
52.5°	349.5	345.4	344.0	344.0	341.2	341.2	341.2	339.9
55°	300.1	297.4	297.4	296.0	293.3	294.7	294.7	291.9
57.5°	254.9	250.8	250.8	249.4	249.4	249.4	246.7	249.4
60°	212.4	209.7	208.3	206.9	205.6	205.6	205.6	204.2
62.5°	172.7	169.9	168.6	167.2	164.5	164.5	161.7	160.3
65°	137.0	134.3	131.6	130.2	127.5	126.1	126.1	124.7
67.5°	104.2	101.4	98.7	97.3	94.6	93.2	91.8	91.8
70°	78.1	74.0	74.0	72.6	71.3	71.3	69.9	69.9
72.5°	56.2	56.2	54.8	54.8	53.4	53.4	53.4	53.4
75°	39.7	39.7	39.7	39.7	38.4	38.4	37.0	37.0
77.5°	26.0	26.0	26.0	24.7	24.7	24.7	24.7	24.7
80°	13.7	13.7	13.7	13.7	13.7	12.3	13.7	12.3
82.5°	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	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

(END OF REPORT)