

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: P345458

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSMMS 3000Lm3500K**

Issue Date: 03/03/2020

Test Information

Test Method: LM-79-08
Report Number: P345458
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 3000Lm3500K
Description: PR4 WALLWASH ASSEMBLY WITH, MATTE METALLIC SILVER FINISH
Light Source: ARRAY OF HIGH LUMEN LEDs 90CRI / 3500K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 2013.4 lumens
Efficiency: N/A
Efficacy: 77.1 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

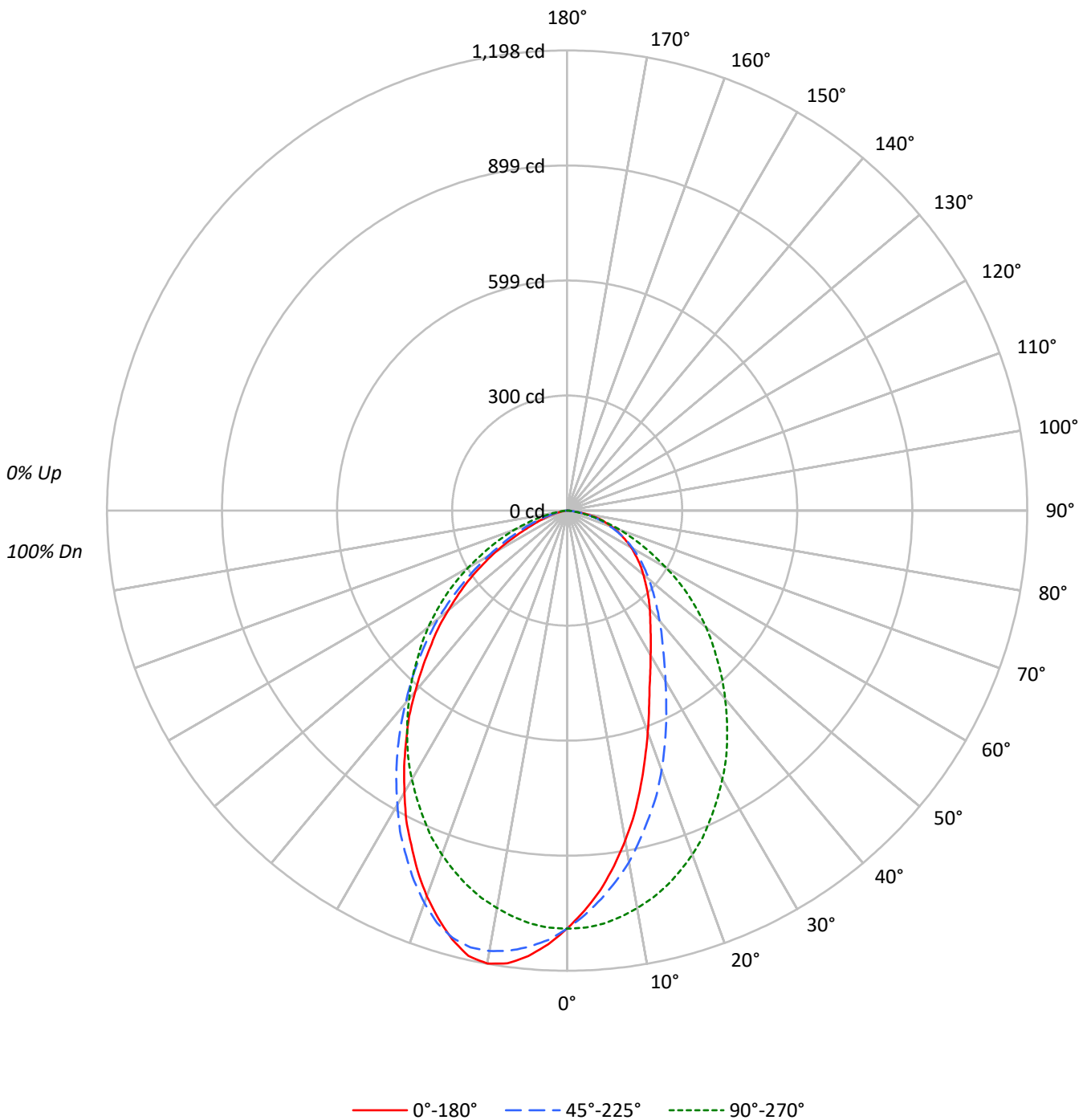
Input Watts (W): 26.1
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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°	106064	106064	106064
5°	97048	105627	113923
10°	86225	104009	118516
15°	74703	101834	116626
20°	63669	98859	110786
25°	54573	95081	103275
30°	48863	90928	95295
35°	44984	86375	86899
40°	42620	81397	78280
45°	40617	76287	69547
50°	39239	71503	61254
55°	38349	65705	52282
60°	37560	58007	41751
65°	36459	49742	29840
70°	35647	41375	21314
75°	34115	31931	15175
80°	24189	18577	8868
85°	6486	9617	1565



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	101.9	5.1
10°-20°	275.7	13.7
20°-30°	371.4	18.4
30°-40°	390.1	19.4
40°-50°	351.5	17.5
50°-60°	271.5	13.5
60°-70°	167.1	8.3
70°-80°	73.6	3.7
80°-90°	10.8	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°	748.9	37.2
0°-40°	1139.0	56.6
0°-60°	1761.9	87.5
0°-90°	2013.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2013.4	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1088	1088	1088	1088	1088	
5°	992	1015	1080	1140	1164	91
15°	740	825	1009	1152	1156	206
25°	508	610	884	992	960	236
35°	378	434	726	771	730	238
45°	295	322	554	545	505	228
55°	226	237	387	332	308	202
65°	158	158	216	160	129	157
75°	91	80	85	50	40	93
85°	6	7	9	4	1	14
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°	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3
2.5°	1042.3	1040.9	1039.5	1042.3	1042.3	1043.8	1043.8	1046.7	1046.7	1049.5	1053.8
5°	992.0	989.1	990.6	990.6	994.9	994.9	997.8	1000.6	1005.0	1010.7	1015.0
7.5°	933.1	933.1	934.5	937.4	941.7	941.7	946.0	950.3	957.5	964.7	973.3
10°	871.3	874.1	875.6	878.4	885.6	888.5	889.9	897.1	907.2	914.4	928.8
12.5°	809.4	809.4	812.3	818.1	823.8	828.1	831.0	841.1	851.1	864.1	877.0
15°	740.4	741.9	746.2	751.9	762.0	764.9	770.6	782.1	796.5	812.3	825.2
17.5°	674.3	677.2	680.0	688.7	695.9	700.2	708.8	721.7	737.5	754.8	774.9
20°	613.9	609.6	615.3	621.1	628.3	638.3	644.1	658.5	675.7	698.7	718.9
22.5°	556.4	556.4	560.7	565.0	572.2	579.4	586.6	598.1	616.8	639.8	662.8
25°	507.5	509.0	513.3	517.6	524.8	529.1	536.3	547.8	566.5	583.7	609.6
27.5°	468.7	470.1	471.6	477.3	483.1	487.4	491.7	503.2	517.6	536.3	557.8
30°	434.2	434.2	435.6	441.4	444.3	450.0	452.9	462.9	475.9	491.7	511.8
32.5°	405.4	405.4	406.9	409.7	415.5	418.4	419.8	429.9	439.9	455.8	471.6
35°	378.1	378.1	379.6	382.4	386.7	388.2	392.5	398.2	408.3	419.8	434.2
37.5°	355.1	355.1	356.6	358.0	360.9	363.7	366.6	372.4	378.1	389.6	404.0
40°	335.0	333.5	335.0	336.4	340.7	340.7	342.2	347.9	353.7	362.3	373.8
42.5°	314.9	314.9	314.9	316.3	319.2	320.6	322.0	324.9	330.7	337.9	346.5
45°	294.7	294.7	296.2	297.6	299.0	300.5	303.4	306.2	309.1	313.4	322.0
47.5°	276.0	277.5	277.5	278.9	280.4	281.8	283.2	286.1	289.0	293.3	299.0
50°	258.8	260.2	260.2	261.7	263.1	263.1	264.5	267.4	270.3	273.2	277.5
52.5°	243.0	243.0	241.5	243.0	244.4	244.4	245.8	247.3	250.2	254.5	257.4
55°	225.7	225.7	225.7	227.2	227.2	227.2	228.6	230.0	231.5	232.9	237.2
57.5°	208.5	208.5	209.9	208.5	209.9	209.9	209.9	211.3	212.8	215.7	217.1
60°	192.7	192.7	192.7	192.7	192.7	192.7	194.1	194.1	194.1	195.5	197.0
62.5°	175.4	175.4	175.4	175.4	175.4	175.4	175.4	175.4	176.8	176.8	178.3
65°	158.1	158.1	159.6	158.1	158.1	158.1	158.1	158.1	158.1	158.1	158.1
67.5°	142.3	140.9	142.3	140.9	140.9	140.9	140.9	139.5	139.5	139.5	138.0
70°	125.1	123.6	123.6	123.6	123.6	122.2	123.6	122.2	120.8	119.3	117.9
72.5°	106.4	106.4	106.4	106.4	106.4	105.0	103.5	103.5	102.1	100.6	99.2
75°	90.6	90.6	89.1	87.7	86.3	86.3	86.3	84.8	83.4	81.9	80.5
77.5°	70.4	69.0	69.0	67.6	66.1	64.7	66.1	64.7	63.3	61.8	60.4
80°	43.1	43.1	43.1	43.1	43.1	43.1	41.7	43.1	41.7	40.3	40.3
82.5°	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
85°	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	7.2	7.2
87.5°	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	4.3	4.3	4.3
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):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3
2.5°	1056.7	1059.6	1063.9	1066.8	1068.2	1069.7	1074.0	1078.3	1082.6	1086.9	1089.8
5°	1022.2	1029.4	1033.7	1040.9	1045.2	1049.5	1056.7	1063.9	1071.1	1079.7	1086.9
7.5°	980.5	992.0	1000.6	1010.7	1016.5	1022.2	1032.3	1043.8	1055.3	1066.8	1078.3
10°	940.3	950.3	966.1	980.5	984.8	993.5	1009.3	1022.2	1038.0	1051.0	1066.8
12.5°	894.3	907.2	924.4	941.7	951.8	960.4	979.1	996.3	1015.0	1032.3	1051.0
15°	843.9	864.1	882.8	902.9	915.8	924.4	946.0	967.6	987.7	1009.3	1030.8
17.5°	793.6	816.6	839.6	864.1	874.1	887.1	911.5	934.5	959.0	982.0	1006.4
20°	743.3	767.7	792.2	819.5	833.9	846.8	872.7	900.0	927.3	953.2	979.1
22.5°	690.1	716.0	744.7	774.9	790.7	802.2	832.4	862.6	891.4	921.6	948.9
25°	636.9	667.1	697.3	728.9	744.7	762.0	792.2	823.8	854.0	884.2	915.8
27.5°	585.1	616.8	648.4	684.4	700.2	717.4	750.5	782.1	815.2	846.8	878.4
30°	537.7	567.9	602.4	638.3	655.6	672.8	707.4	741.9	774.9	808.0	838.2
32.5°	494.6	520.5	556.4	592.3	611.0	628.3	664.2	700.2	734.7	769.2	799.4
35°	454.3	478.8	509.0	547.8	565.0	583.7	621.1	655.6	691.5	726.0	757.7
37.5°	418.4	441.4	468.7	501.8	523.3	540.6	578.0	613.9	648.4	682.9	714.5
40°	386.7	406.9	429.9	460.1	480.2	498.9	536.3	572.2	606.7	639.8	671.4
42.5°	358.0	373.8	395.4	422.7	438.5	457.2	496.0	530.5	565.0	598.1	626.8
45°	330.7	343.6	362.3	386.7	399.7	419.8	455.8	490.3	523.3	553.5	585.1
47.5°	306.2	317.7	332.1	352.2	365.2	381.0	416.9	451.4	483.1	513.3	540.6
50°	284.7	293.3	306.2	323.5	333.5	345.1	381.0	414.1	442.8	471.6	497.4
52.5°	263.1	268.9	278.9	293.3	303.4	313.4	343.6	375.2	404.0	428.4	455.8
55°	240.1	247.3	255.9	266.0	273.2	281.8	306.2	336.4	360.9	386.7	408.3
57.5°	220.0	224.3	230.0	238.7	244.4	251.6	270.3	296.2	320.6	342.2	363.7
60°	199.8	202.7	207.0	212.8	217.1	222.8	235.8	258.8	280.4	297.6	316.3
62.5°	179.7	179.7	182.6	186.9	189.8	194.1	205.6	222.8	241.5	254.5	270.3
65°	158.1	159.6	161.0	163.9	165.3	168.2	175.4	188.3	202.7	215.7	227.2
67.5°	138.0	138.0	139.5	140.9	140.9	142.3	146.6	155.3	169.7	178.3	186.9
70°	117.9	117.9	117.9	117.9	119.3	117.9	120.8	126.5	136.6	145.2	149.5
72.5°	99.2	97.8	96.3	96.3	96.3	96.3	97.8	102.1	107.8	112.1	117.9
75°	79.1	77.6	76.2	74.8	76.2	76.2	76.2	77.6	80.5	84.8	86.3
77.5°	58.9	58.9	56.1	54.6	56.1	54.6	53.2	53.2	54.6	56.1	56.1
80°	40.3	38.8	37.4	35.9	35.9	35.9	34.5	33.1	33.1	33.1	31.6
82.5°	20.1	20.1	18.7	18.7	18.7	18.7	18.7	17.3	17.3	15.8	15.8
85°	7.2	7.2	7.2	7.2	8.6	7.2	8.6	8.6	8.6	8.6	8.6
87.5°	4.3	4.3	5.8	5.8	5.8	5.8	5.8	7.2	7.2	7.2	5.8
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°	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3
2.5°	1094.1	1098.4	1101.3	1104.2	1105.6	1108.5	1112.8	1115.7	1118.5	1121.4	1124.3
5°	1094.1	1102.7	1108.5	1112.8	1117.1	1122.9	1130.0	1135.8	1140.1	1145.9	1150.2
7.5°	1089.8	1101.3	1111.4	1117.1	1122.9	1131.5	1140.1	1148.7	1155.9	1163.1	1168.9
10°	1081.2	1095.5	1109.9	1115.7	1122.9	1134.4	1145.9	1155.9	1164.5	1173.2	1180.4
12.5°	1068.2	1085.5	1102.7	1109.9	1117.1	1131.5	1144.4	1155.9	1164.5	1171.7	1176.0
15°	1051.0	1071.1	1089.8	1098.4	1107.0	1121.4	1134.4	1144.4	1151.6	1155.9	1158.8
17.5°	1029.4	1051.0	1071.1	1081.2	1091.2	1105.6	1115.7	1121.4	1125.7	1125.7	1124.3
20°	1005.0	1028.0	1049.5	1059.6	1068.2	1079.7	1086.9	1088.3	1086.9	1084.0	1081.2
22.5°	974.8	1000.6	1022.2	1030.8	1038.0	1046.7	1046.7	1045.2	1042.3	1038.0	1036.6
25°	943.1	967.6	989.1	997.8	1000.6	1006.4	1002.1	999.2	992.0	987.7	983.4
27.5°	908.6	934.5	950.3	956.1	959.0	956.1	951.8	946.0	941.7	934.5	928.8
30°	871.3	894.3	907.2	911.5	910.1	905.8	901.4	891.4	884.2	877.0	869.8
32.5°	828.1	851.1	861.2	862.6	858.3	851.1	843.9	836.7	828.1	819.5	815.2
35°	786.4	806.6	812.3	809.4	805.1	796.5	786.4	777.8	770.6	760.6	753.4
37.5°	741.9	759.1	759.1	754.8	751.9	741.9	731.8	723.2	713.1	704.5	694.4
40°	697.3	710.2	705.9	701.6	697.3	685.8	677.2	664.2	654.2	644.1	636.9
42.5°	652.7	659.9	654.2	648.4	642.7	631.2	622.5	608.2	599.5	589.5	583.7
45°	608.2	609.6	601.0	596.7	590.9	576.5	565.0	555.0	544.9	533.4	526.2
47.5°	562.1	559.3	549.2	543.5	537.7	524.8	513.3	501.8	490.3	481.6	473.0
50°	516.1	509.0	498.9	493.1	485.9	474.4	461.5	448.6	438.5	429.9	422.7
52.5°	465.8	460.1	448.6	439.9	434.2	418.4	406.9	395.4	383.9	375.2	369.5
55°	415.5	406.9	393.9	388.2	379.6	366.6	355.1	340.7	332.1	324.9	317.7
57.5°	365.2	355.1	343.6	336.4	327.8	314.9	301.9	293.3	284.7	276.0	271.7
60°	316.3	306.2	291.9	289.0	280.4	267.4	255.9	245.8	237.2	231.5	227.2
62.5°	270.3	260.2	245.8	240.1	234.3	221.4	211.3	202.7	197.0	191.2	186.9
65°	224.3	215.7	204.2	197.0	191.2	181.2	172.5	163.9	159.6	152.4	148.1
67.5°	182.6	172.5	163.9	158.1	153.8	143.8	136.6	130.8	125.1	120.8	115.0
70°	143.8	135.1	126.5	123.6	119.3	112.1	106.4	100.6	96.3	92.0	86.3
72.5°	110.7	105.0	96.3	93.5	90.6	84.8	80.5	76.2	70.4	67.6	64.7
75°	81.9	76.2	70.4	67.6	66.1	60.4	57.5	53.2	50.3	48.9	46.0
77.5°	53.2	48.9	46.0	44.6	43.1	40.3	37.4	35.9	33.1	31.6	31.6
80°	30.2	28.8	27.3	25.9	24.4	23.0	23.0	21.6	20.1	18.7	17.3
82.5°	14.4	14.4	12.9	12.9	12.9	11.5	11.5	10.1	10.1	8.6	8.6
85°	7.2	7.2	7.2	7.2	7.2	5.8	5.8	5.8	4.3	4.3	2.9
87.5°	5.8	5.8	5.8	5.8	5.8	4.3	4.3	4.3	2.9	2.9	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 PR4M24WW9FSMMS 3000Lm3500K

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3	1088.3
2.5°	1124.3	1125.7	1127.2	1128.6	1128.6	1130.0	1131.5	1130.0
5°	1153.0	1157.4	1158.8	1160.2	1161.7	1163.1	1164.5	1164.5
7.5°	1174.6	1180.4	1181.8	1181.8	1186.1	1187.6	1189.0	1189.0
10°	1186.1	1189.0	1191.9	1191.9	1194.7	1194.7	1197.6	1197.6
12.5°	1180.4	1183.2	1184.7	1186.1	1186.1	1187.6	1187.6	1187.6
15°	1160.2	1158.8	1158.8	1157.4	1157.4	1155.9	1155.9	1155.9
17.5°	1122.9	1121.4	1120.0	1120.0	1117.1	1117.1	1114.2	1114.2
20°	1078.3	1075.4	1074.0	1072.5	1072.5	1071.1	1068.2	1068.2
22.5°	1030.8	1028.0	1025.1	1022.2	1019.3	1017.9	1016.5	1016.5
25°	977.6	973.3	971.9	970.5	966.1	964.7	961.8	960.4
27.5°	923.0	915.8	914.4	912.9	910.1	908.6	907.2	907.2
30°	865.5	861.2	858.3	856.9	852.6	851.1	846.8	846.8
32.5°	808.0	800.8	797.9	796.5	793.6	790.7	789.3	789.3
35°	747.6	743.3	741.9	737.5	733.2	733.2	730.4	730.4
37.5°	690.1	685.8	681.5	680.0	677.2	672.8	671.4	675.7
40°	632.6	626.8	624.0	622.5	619.7	615.3	615.3	615.3
42.5°	576.5	572.2	570.8	567.9	565.0	563.6	560.7	559.3
45°	519.0	516.1	514.7	511.8	510.4	507.5	504.6	504.6
47.5°	468.7	462.9	462.9	460.1	457.2	455.8	455.8	457.2
50°	418.4	414.1	411.2	409.7	406.9	406.9	405.4	404.0
52.5°	363.7	360.9	359.4	359.4	356.6	356.6	355.1	355.1
55°	313.4	313.4	312.0	310.5	307.7	307.7	307.7	307.7
57.5°	268.9	266.0	264.5	263.1	261.7	260.2	260.2	258.8
60°	222.8	221.4	218.5	220.0	215.7	215.7	215.7	214.2
62.5°	181.2	178.3	176.8	175.4	172.5	172.5	169.7	168.2
65°	145.2	140.9	138.0	138.0	135.1	132.3	130.8	129.4
67.5°	109.3	106.4	105.0	103.5	100.6	97.8	97.8	96.3
70°	83.4	80.5	79.1	77.6	76.2	74.8	74.8	74.8
72.5°	61.8	60.4	58.9	58.9	57.5	56.1	56.1	57.5
75°	44.6	43.1	43.1	43.1	41.7	41.7	41.7	40.3
77.5°	30.2	28.8	28.8	27.3	27.3	27.3	27.3	27.3
80°	17.3	15.8	15.8	15.8	15.8	15.8	15.8	15.8
82.5°	7.2	7.2	7.2	7.2	5.8	5.8	5.8	5.8
85°	2.9	2.9	2.9	2.9	2.9	1.4	1.4	1.4
87.5°	1.4	1.4	1.4	1.4	1.4	1.4	0.0	1.4
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)