

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: P345422

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSMW 3000Lm3500K**

Issue Date: 03/03/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P345422  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-1908-453-7)  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 03/03/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO COMMERCIAL  
Catalog Number: PR4FS24D010 PR4M24WW9FSMW 3000Lm3500K  
Description: PR4 WALLWASH ASSEMBLY WITH, MATTE WHITE FINISH  
Light Source: ARRAY OF HIGH LUMEN LEDs 90CRI / 3500K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2023.5 lumens  
Efficiency: N/A  
Efficacy: 77.5 lumens/watt  
Spacing Criteria (0/90/45): 0.95 / 1.12 / 1.11  
Luminous Opening: Circular (Dia: 0.4' x H: 0')  
CIE Type: Direct

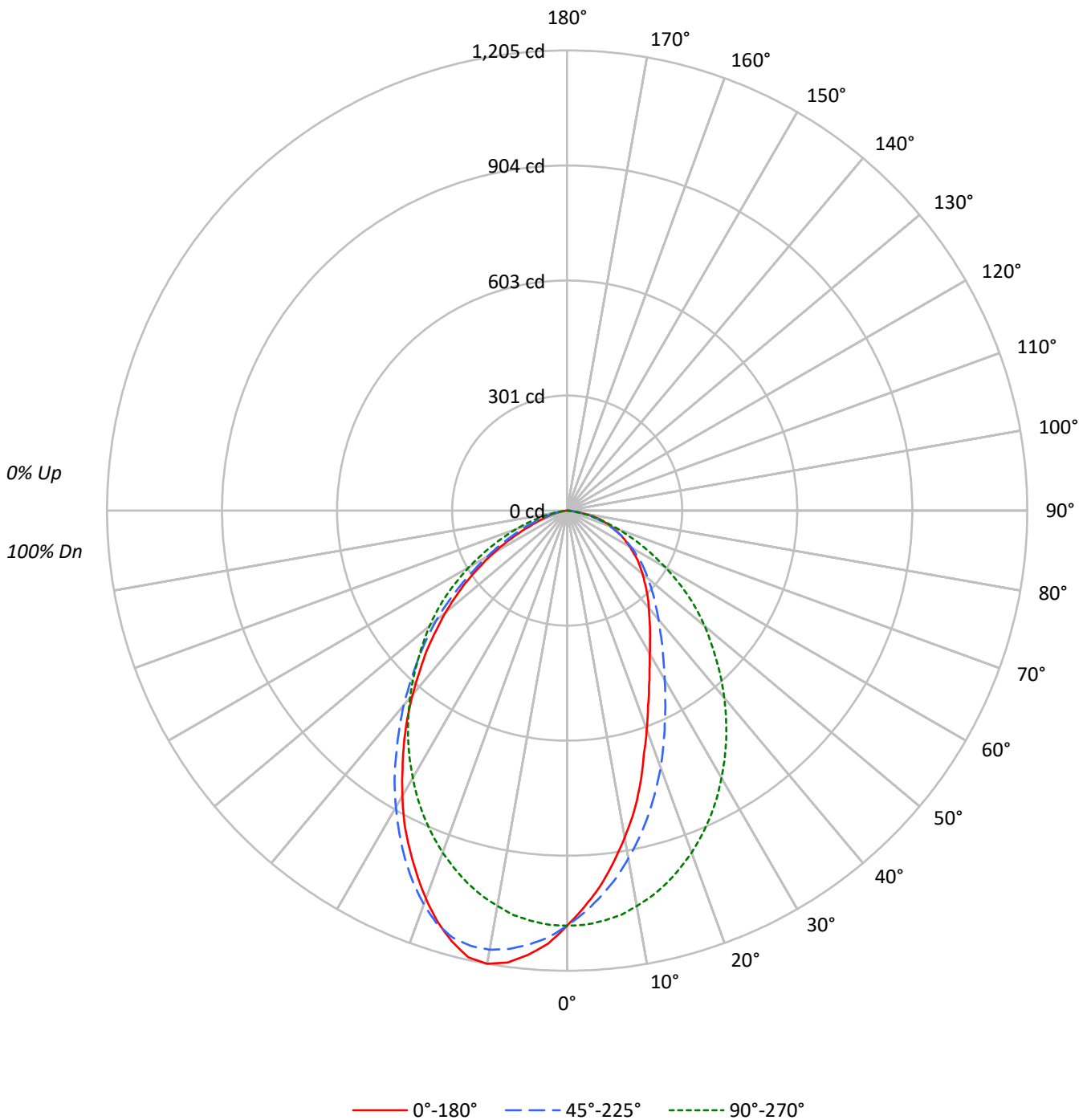
Input Watts (W): 26.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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	35	45	39	35					34				
10	58	45	38	33	56	45	38	33	44	37	33	43	37	33	42	36	32					31				

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

	0°	90°	180°
0°	95097	95097	95097
5°	86750	94705	102528
10°	77148	93375	107036
15°	67065	91424	105741
20°	56762	88755	100669
25°	48999	85500	94244
30°	43723	81629	87154
35°	40384	77544	79541
40°	37932	73077	71924
45°	36294	68307	64398
50°	35027	63998	56758
55°	34205	58773	48464
60°	33203	52079	39239
65°	32453	44354	28872
70°	31635	36418	19871
75°	30146	27712	15073
80°	21005	15917	8714
85°	8631	5821	2910



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	101.9	5.0
10°-20°	276.1	13.6
20°-30°	373.1	18.4
30°-40°	392.7	19.4
40°-50°	353.8	17.5
50°-60°	273.2	13.5
60°-70°	168.2	8.3
70°-80°	73.9	3.7
80°-90°	10.6	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°	751.1	37.1
0°-40°	1143.8	56.5
0°-60°	1770.8	87.5
0°-90°	2023.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2023.5	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	1087	1087	1087	1087	1087	
5°	988	1014	1079	1140	1168	91
15°	741	824	1010	1158	1168	206
25°	508	605	886	1005	976	235
35°	378	434	726	781	745	237
45°	293	321	552	552	521	227
55°	224	236	385	341	318	200
65°	157	157	214	162	140	155
75°	89	79	82	53	45	92
85°	9	7	6	4	3	15
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°	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2
2.5°	1038.3	1039.8	1039.8	1039.8	1041.2	1042.6	1042.6	1045.5	1046.9	1049.8	1052.7
5°	988.0	986.5	986.5	989.4	992.3	993.7	993.7	999.5	1003.8	1008.1	1013.9
7.5°	929.0	927.6	931.9	933.3	936.2	940.5	943.4	949.2	953.5	963.5	972.2
10°	868.6	868.6	871.5	875.8	880.1	884.4	887.3	894.5	903.1	913.2	924.7
12.5°	808.2	803.9	808.2	814.0	818.3	822.6	826.9	835.5	848.5	861.4	875.8
15°	740.6	739.2	742.1	747.8	757.9	760.8	765.1	778.0	791.0	808.2	824.0
17.5°	668.7	673.0	674.5	683.1	693.2	697.5	701.8	714.7	733.4	750.7	769.4
20°	609.8	606.9	612.6	618.4	627.0	634.2	640.0	654.3	674.5	693.2	716.2
22.5°	553.7	552.2	556.5	563.7	570.9	576.7	582.4	596.8	612.6	634.2	660.1
25°	507.7	506.2	510.5	514.8	523.5	527.8	532.1	546.5	563.7	581.0	605.4
27.5°	467.4	467.4	470.3	473.1	480.3	484.6	490.4	501.9	516.3	533.5	556.5
30°	432.9	432.9	435.7	438.6	445.8	448.7	453.0	461.6	473.1	491.8	510.5
32.5°	404.1	404.1	405.5	409.9	412.7	415.6	419.9	427.1	438.6	453.0	470.3
35°	378.2	378.2	379.7	382.5	386.9	388.3	391.2	398.4	407.0	418.5	434.3
37.5°	353.8	355.2	355.2	358.1	361.0	362.4	365.3	371.0	378.2	388.3	401.2
40°	332.2	333.6	333.6	336.5	339.4	340.8	342.3	345.1	353.8	361.0	372.5
42.5°	313.5	313.5	313.5	314.9	317.8	319.3	320.7	325.0	329.3	336.5	345.1
45°	293.4	293.4	294.8	296.3	299.1	299.1	300.6	304.9	307.8	313.5	320.7
47.5°	274.7	274.7	276.1	276.1	279.0	279.0	280.4	283.3	286.2	291.9	297.7
50°	257.4	257.4	257.4	258.9	260.3	261.7	261.7	264.6	267.5	271.8	276.1
52.5°	240.2	240.2	240.2	240.2	241.6	243.0	243.0	245.9	248.8	251.7	256.0
55°	224.3	222.9	224.3	224.3	224.3	225.8	225.8	228.7	228.7	231.5	235.8
57.5°	205.6	207.1	207.1	205.6	207.1	208.5	208.5	208.5	210.0	212.8	214.3
60°	189.8	189.8	189.8	189.8	191.3	191.3	191.3	191.3	192.7	192.7	195.6
62.5°	172.6	172.6	174.0	174.0	172.6	174.0	174.0	174.0	175.4	175.4	175.4
65°	156.8	156.8	156.8	156.8	156.8	156.8	156.8	156.8	156.8	156.8	156.8
67.5°	139.5	139.5	139.5	139.5	139.5	139.5	139.5	138.1	138.1	138.1	136.6
70°	123.7	123.7	123.7	122.2	122.2	122.2	122.2	120.8	120.8	119.4	117.9
72.5°	106.4	106.4	106.4	105.0	105.0	105.0	103.5	102.1	100.7	99.2	99.2
75°	89.2	89.2	87.7	86.3	86.3	84.8	84.8	83.4	83.4	80.5	79.1
77.5°	69.0	67.6	67.6	67.6	66.2	64.7	64.7	63.3	61.8	61.8	60.4
80°	41.7	41.7	43.1	41.7	43.1	41.7	41.7	43.1	41.7	40.3	40.3
82.5°	20.1	20.1	21.6	20.1	21.6	21.6	21.6	20.1	20.1	20.1	20.1
85°	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	7.2	7.2	7.2
87.5°	5.8	4.3	4.3	4.3	4.3	4.3	4.3	4.3	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°	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2
2.5°	1055.6	1059.9	1061.3	1065.6	1067.1	1070.0	1072.8	1077.1	1081.5	1085.8	1088.6
5°	1019.6	1026.8	1032.6	1039.8	1044.1	1046.9	1055.6	1062.8	1071.4	1078.6	1085.8
7.5°	980.8	989.4	1002.4	1011.0	1015.3	1022.5	1032.6	1044.1	1055.6	1068.5	1078.6
10°	936.2	949.2	962.1	977.9	985.1	992.3	1005.2	1021.1	1036.9	1051.3	1067.1
12.5°	888.8	906.0	923.3	939.1	949.2	957.8	977.9	995.2	1013.9	1032.6	1049.8
15°	842.7	861.4	881.6	901.7	913.2	923.3	943.4	965.0	988.0	1009.6	1029.7
17.5°	792.4	814.0	837.0	860.0	871.5	884.4	910.3	933.3	959.2	982.2	1006.7
20°	740.6	765.1	789.5	818.3	829.8	844.2	870.1	898.8	926.1	953.5	979.4
22.5°	687.4	714.7	742.1	772.3	788.1	802.5	832.7	861.4	891.6	920.4	949.2
25°	632.8	664.4	696.0	726.2	743.5	757.9	791.0	824.0	855.7	885.9	916.1
27.5°	582.4	612.6	647.1	680.2	697.5	713.3	749.3	780.9	815.4	848.5	878.7
30°	536.4	565.2	599.7	635.6	652.9	670.2	706.1	742.1	773.7	808.2	841.3
32.5°	493.3	519.2	553.7	589.6	609.8	625.6	663.0	697.5	733.4	767.9	801.0
35°	453.0	478.9	509.1	545.0	562.3	581.0	619.8	655.8	690.3	726.2	756.4
37.5°	418.5	438.6	465.9	500.5	519.2	537.9	576.7	612.6	647.1	683.1	714.7
40°	385.4	404.1	428.6	458.8	477.5	496.1	533.5	569.5	604.0	640.0	673.0
42.5°	358.1	372.5	392.6	421.4	437.2	455.9	493.3	527.8	562.3	596.8	628.5
45°	330.8	343.7	361.0	384.0	399.8	417.1	453.0	489.0	520.6	552.2	583.9
47.5°	304.9	314.9	330.8	350.9	363.8	379.7	414.2	448.7	480.3	510.5	539.3
50°	281.9	290.5	304.9	319.3	330.8	345.1	375.3	409.9	440.1	470.3	496.1
52.5°	260.3	267.5	277.6	291.9	300.6	312.1	340.8	371.0	401.2	428.6	453.0
55°	240.2	244.5	253.1	263.2	270.4	280.4	304.9	333.6	361.0	385.4	405.5
57.5°	217.2	222.9	228.7	235.8	243.0	248.8	267.5	293.4	317.8	339.4	359.5
60°	197.0	201.3	204.2	211.4	214.3	220.0	234.4	256.0	279.0	297.7	312.1
62.5°	176.9	178.3	181.2	187.0	188.4	192.7	202.8	220.0	237.3	254.5	268.9
65°	156.8	156.8	159.6	161.1	163.9	165.4	172.6	185.5	201.3	214.3	222.9
67.5°	136.6	136.6	138.1	138.1	140.9	140.9	145.2	155.3	165.4	176.9	184.1
70°	116.5	116.5	116.5	116.5	116.5	117.9	120.8	126.6	133.7	142.4	146.7
72.5°	97.8	96.4	96.4	94.9	94.9	94.9	96.4	99.2	105.0	110.7	115.0
75°	77.7	76.2	74.8	74.8	73.3	73.3	73.3	76.2	79.1	82.0	83.4
77.5°	57.5	57.5	56.1	53.2	53.2	51.8	51.8	51.8	53.2	56.1	54.6
80°	40.3	37.4	36.0	36.0	34.5	34.5	33.1	31.6	31.6	31.6	30.2
82.5°	18.7	18.7	18.7	17.3	17.3	17.3	17.3	15.8	15.8	14.4	14.4
85°	7.2	7.2	7.2	7.2	7.2	7.2	7.2	5.8	5.8	5.8	5.8
87.5°	4.3	4.3	4.3	4.3	4.3	2.9	2.9	2.9	2.9	2.9	2.9
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):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2
2.5°	1093.0	1097.3	1101.6	1103.0	1104.5	1108.8	1111.7	1116.0	1118.8	1120.3	1123.2
5°	1094.4	1101.6	1108.8	1113.1	1116.0	1123.2	1128.9	1136.1	1140.4	1147.6	1151.9
7.5°	1090.1	1101.6	1111.7	1117.4	1123.2	1133.2	1141.9	1150.5	1157.7	1164.9	1172.1
10°	1081.5	1095.8	1110.2	1116.0	1123.2	1134.7	1147.6	1157.7	1167.7	1176.4	1185.0
12.5°	1068.5	1085.8	1103.0	1110.2	1117.4	1133.2	1146.2	1157.7	1167.7	1176.4	1182.1
15°	1051.3	1071.4	1090.1	1100.2	1108.8	1124.6	1137.5	1149.0	1157.7	1163.4	1167.7
17.5°	1029.7	1052.7	1074.3	1082.9	1093.0	1107.3	1120.3	1128.9	1134.7	1134.7	1136.1
20°	1005.2	1029.7	1051.3	1061.3	1071.4	1082.9	1093.0	1097.3	1097.3	1097.3	1094.4
22.5°	976.5	1002.4	1023.9	1034.0	1042.6	1051.3	1057.0	1057.0	1054.1	1049.8	1045.5
25°	943.4	970.7	990.9	1000.9	1005.2	1012.4	1011.0	1009.6	1005.2	1000.9	995.2
27.5°	907.4	934.8	956.3	960.7	963.5	965.0	960.7	957.8	952.0	946.3	942.0
30°	870.1	895.9	913.2	914.6	917.5	916.1	910.3	903.1	897.4	890.2	884.4
32.5°	829.8	854.2	865.7	868.6	867.2	861.4	855.7	848.5	841.3	832.7	825.5
35°	786.6	809.7	816.8	815.4	814.0	806.8	798.1	791.0	780.9	775.1	765.1
37.5°	742.1	763.6	766.5	762.2	757.9	749.3	740.6	733.4	721.9	716.2	709.0
40°	697.5	711.9	711.9	707.5	704.7	696.0	684.5	674.5	665.8	655.8	651.5
42.5°	651.5	663.0	657.2	654.3	650.0	637.1	628.5	618.4	606.9	601.1	593.9
45°	605.4	612.6	605.4	599.7	595.4	583.9	575.2	562.3	552.2	546.5	537.9
47.5°	558.0	560.9	555.1	546.5	543.6	530.7	520.6	510.5	500.5	490.4	483.2
50°	514.8	512.0	503.3	497.6	493.3	478.9	467.4	455.9	447.3	438.6	431.4
52.5°	465.9	463.1	451.6	444.4	437.2	425.7	411.3	402.7	392.6	385.4	378.2
55°	415.6	407.0	398.4	391.2	384.0	372.5	359.5	348.0	340.8	332.2	327.9
57.5°	363.8	358.1	343.7	338.0	332.2	320.7	307.8	297.7	287.6	281.9	279.0
60°	317.8	307.8	296.3	289.1	283.3	271.8	260.3	250.2	243.0	240.2	235.8
62.5°	268.9	260.3	247.4	241.6	237.3	225.8	215.7	207.1	201.3	195.6	192.7
65°	224.3	214.3	204.2	198.5	192.7	182.6	175.4	169.7	162.5	158.2	155.3
67.5°	181.2	172.6	163.9	159.6	155.3	146.7	139.5	135.2	129.4	125.1	119.4
70°	142.4	135.2	129.4	125.1	120.8	113.6	107.9	103.5	99.2	94.9	90.6
72.5°	110.7	103.5	96.4	94.9	92.0	86.3	82.0	77.7	73.3	70.5	67.6
75°	79.1	76.2	70.5	67.6	66.2	61.8	57.5	54.6	53.2	50.3	48.9
77.5°	51.8	48.9	44.6	44.6	43.1	41.7	38.8	36.0	36.0	34.5	34.5
80°	28.8	27.3	25.9	24.4	25.9	24.4	23.0	21.6	21.6	21.6	20.1
82.5°	12.9	12.9	11.5	11.5	11.5	11.5	11.5	10.1	10.1	10.1	10.1
85°	5.8	5.8	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
87.5°	2.9	2.9	2.9	2.9	2.9	2.9	1.4	1.4	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





TEST NUMBER: P345422

CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSMW 3000lm3500K

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2	1087.2
2.5°	1126.0	1127.5	1128.9	1130.4	1131.8	1131.8	1133.2	1134.7
5°	1154.8	1159.1	1160.6	1162.0	1164.9	1166.3	1166.3	1167.7
7.5°	1177.8	1183.6	1185.0	1187.9	1190.8	1192.2	1193.6	1193.6
10°	1190.8	1195.1	1196.5	1199.4	1202.3	1203.7	1205.1	1205.1
12.5°	1186.4	1190.8	1192.2	1193.6	1196.5	1197.9	1197.9	1197.9
15°	1170.6	1170.6	1170.6	1170.6	1169.2	1170.6	1170.6	1167.7
17.5°	1134.7	1133.2	1134.7	1131.8	1130.4	1130.4	1128.9	1128.9
20°	1091.5	1090.1	1088.6	1088.6	1087.2	1084.3	1082.9	1081.5
22.5°	1042.6	1039.8	1038.3	1038.3	1035.4	1034.0	1032.6	1029.7
25°	992.3	985.1	985.1	985.1	982.2	982.2	979.4	976.5
27.5°	934.8	930.5	930.5	927.6	924.7	923.3	921.8	923.3
30°	880.1	874.4	871.5	870.1	868.6	868.6	864.3	862.9
32.5°	819.7	815.4	812.5	811.1	808.2	806.8	805.3	802.5
35°	760.8	756.4	753.6	753.6	747.8	746.4	744.9	744.9
37.5°	700.4	697.5	696.0	691.7	690.3	688.9	688.9	687.4
40°	644.3	640.0	638.5	634.2	632.8	632.8	628.5	629.9
42.5°	586.7	581.0	579.6	578.1	576.7	573.8	575.2	572.4
45°	532.1	527.8	524.9	524.9	523.5	520.6	519.2	520.6
47.5°	478.9	473.1	473.1	471.7	470.3	468.8	468.8	465.9
50°	428.6	424.2	421.4	418.5	419.9	418.5	415.6	417.1
52.5°	373.9	369.6	368.2	368.2	366.7	366.7	365.3	365.3
55°	325.0	320.7	320.7	319.3	319.3	319.3	317.8	317.8
57.5°	276.1	273.2	271.8	271.8	268.9	270.4	268.9	267.5
60°	233.0	228.7	225.8	227.2	225.8	225.8	222.9	224.3
62.5°	188.4	185.5	184.1	184.1	181.2	181.2	178.3	179.8
65°	151.0	146.7	145.2	143.8	140.9	139.5	139.5	139.5
67.5°	116.5	113.6	112.2	109.3	106.4	105.0	103.5	102.1
70°	87.7	84.8	83.4	82.0	80.5	79.1	79.1	77.7
72.5°	66.2	63.3	63.3	61.8	61.8	60.4	60.4	60.4
75°	47.5	47.5	46.0	46.0	44.6	46.0	44.6	44.6
77.5°	33.1	31.6	33.1	31.6	30.2	30.2	30.2	30.2
80°	18.7	18.7	18.7	18.7	18.7	18.7	18.7	17.3
82.5°	10.1	10.1	10.1	8.6	8.6	8.6	8.6	8.6
85°	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
87.5°	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)