

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: P345501

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSBZ 4000Lm4000K**

Issue Date: 03/03/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P345501  
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 4000lm4000K  
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: 2725.4 lumens  
Efficiency: N/A  
Efficacy: 60.6 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

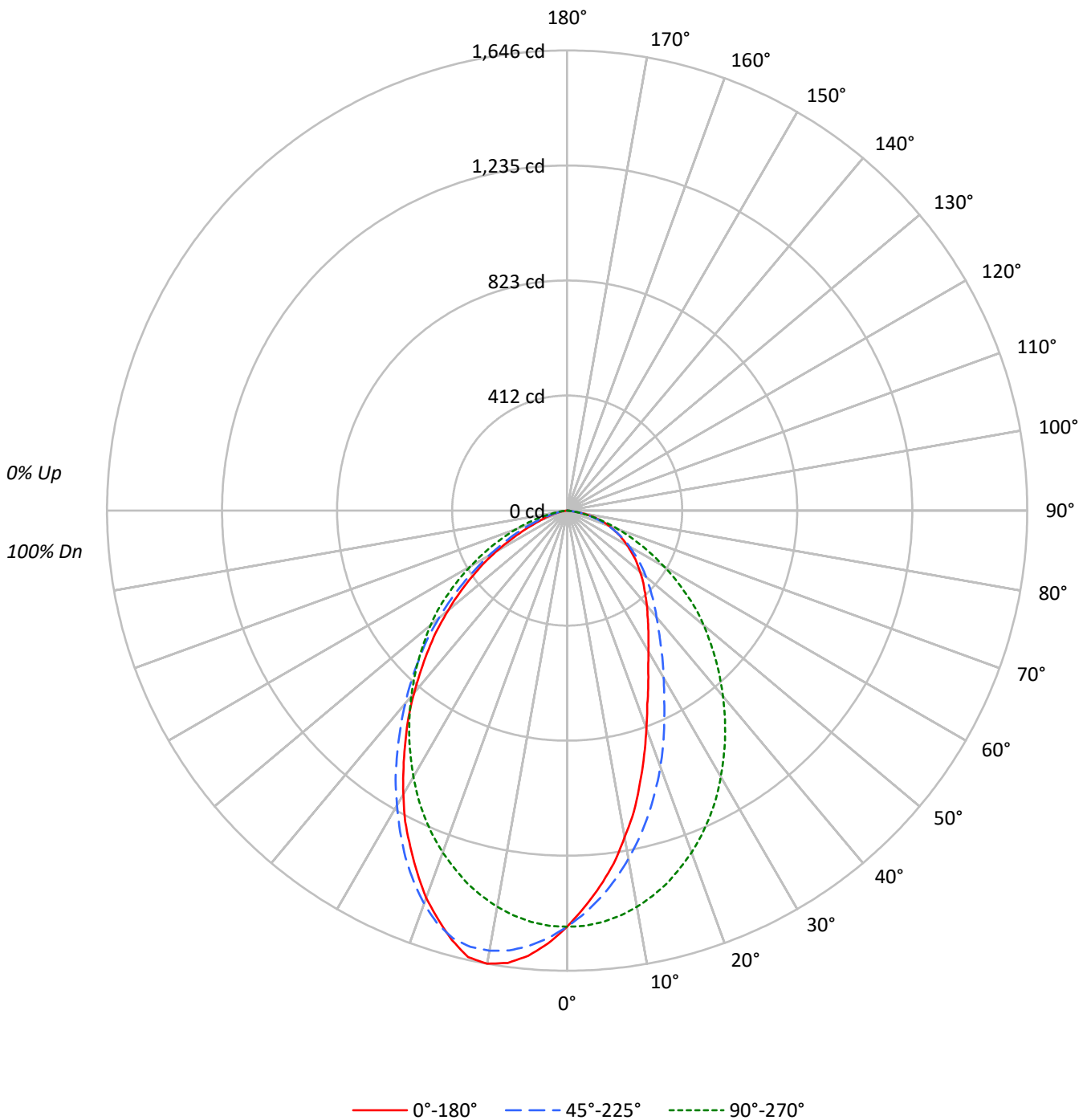
Input Watts (W): 45  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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°	130198	130198	130198
5°	118438	129660	140363
10°	105312	127837	146178
15°	91171	125002	144055
20°	77054	121166	137270
25°	66226	116519	128100
30°	58783	111020	118363
35°	53956	105189	107709
40°	50743	99008	97216
45°	48157	92911	86590
50°	46294	86695	75455
55°	44972	79162	63866
60°	43350	69836	51257
65°	42325	60228	37027
70°	40740	49282	25651
75°	37885	37209	17945
80°	25740	19796	8916
85°	2007	7928	0



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	139.4	5.1
10°-20°	377.1	13.8
20°-30°	507.7	18.6
30°-40°	531.8	19.5
40°-50°	476.9	17.5
50°-60°	365.1	13.4
60°-70°	222.3	8.2
70°-80°	94.5	3.5
80°-90°	10.6	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°	1024.1	37.6
0°-40°	1555.9	57.1
0°-60°	2397.9	88.0
0°-90°	2725.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2725.4	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	1488	1488	1488	1488	1488	
5°	1349	1388	1477	1563	1599	124
15°	1007	1125	1380	1583	1591	281
25°	686	822	1207	1369	1327	317
35°	505	582	985	1060	1009	317
45°	389	429	751	747	700	301
55°	295	313	519	454	419	263
65°	204	206	291	216	179	202
75°	112	100	110	67	53	115
85°	2	4	8	2	0	13
90°	0	0	0	0	0	



TEST NUMBER: P345501

CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSBZ 4000lm4000K

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5
2.5°	1419.7	1421.7	1425.6	1423.6	1427.5	1427.5	1427.5	1431.5	1435.4	1437.4	1441.3
5°	1348.9	1350.9	1352.8	1356.8	1358.7	1356.8	1362.7	1368.6	1374.5	1382.3	1388.2
7.5°	1274.2	1274.2	1272.2	1278.1	1286.0	1287.9	1291.9	1297.8	1305.6	1317.4	1329.2
10°	1185.7	1187.7	1191.6	1193.6	1205.4	1207.3	1213.2	1221.1	1234.8	1248.6	1264.3
12.5°	1103.1	1101.1	1103.1	1109.0	1116.9	1126.7	1132.6	1142.4	1160.1	1177.8	1197.5
15°	1006.8	1008.7	1014.6	1020.5	1032.3	1038.2	1048.0	1065.7	1083.4	1101.1	1124.7
17.5°	916.3	914.3	922.2	932.0	941.9	951.7	959.6	975.3	998.9	1024.5	1050.0
20°	827.8	825.9	831.8	839.6	855.3	861.2	871.1	894.7	916.3	943.8	975.3
22.5°	749.2	749.2	755.1	764.9	774.7	780.6	790.5	810.1	835.7	867.1	898.6
25°	686.2	686.2	690.2	696.1	707.9	713.8	723.6	737.4	761.0	790.5	821.9
27.5°	627.3	631.2	633.2	639.1	648.9	654.8	660.7	676.4	696.1	721.6	751.1
30°	582.0	584.0	586.0	589.9	597.8	601.7	609.6	623.3	641.0	662.7	690.2
32.5°	540.7	542.7	542.7	548.6	554.5	560.4	564.3	576.1	587.9	609.6	635.1
35°	505.3	505.3	509.3	511.2	515.2	519.1	523.0	532.9	546.6	562.4	582.0
37.5°	471.9	471.9	473.9	477.8	481.7	485.7	487.6	495.5	507.3	521.1	536.8
40°	444.4	444.4	444.4	448.3	452.3	454.2	456.2	464.1	473.9	483.7	497.5
42.5°	414.9	416.9	418.8	420.8	422.8	426.7	428.7	432.6	440.5	448.3	462.1
45°	389.3	391.3	391.3	393.3	397.2	397.2	399.2	405.1	411.0	418.8	428.7
47.5°	365.7	365.7	365.7	367.7	369.7	371.6	373.6	377.5	383.4	387.4	397.2
50°	340.2	340.2	342.1	344.1	346.1	346.1	348.0	350.0	355.9	359.8	367.7
52.5°	316.6	316.6	318.5	318.5	320.5	320.5	322.5	326.4	328.4	334.3	340.2
55°	294.9	293.0	294.9	294.9	294.9	296.9	296.9	300.8	304.8	306.7	312.6
57.5°	269.4	271.4	271.4	273.3	273.3	273.3	275.3	275.3	279.2	281.2	283.2
60°	247.8	249.7	249.7	249.7	249.7	249.7	251.7	251.7	253.7	255.6	257.6
62.5°	226.1	226.1	226.1	226.1	226.1	228.1	228.1	228.1	228.1	230.1	232.0
65°	204.5	204.5	204.5	204.5	204.5	204.5	204.5	204.5	204.5	204.5	206.5
67.5°	180.9	180.9	180.9	182.9	180.9	180.9	180.9	180.9	180.9	180.9	178.9
70°	159.3	159.3	159.3	159.3	159.3	157.3	157.3	155.3	155.3	153.4	153.4
72.5°	135.7	135.7	135.7	133.7	133.7	133.7	131.7	129.8	127.8	127.8	127.8
75°	112.1	112.1	110.1	110.1	108.1	108.1	106.2	104.2	102.2	100.3	100.3
77.5°	84.6	84.6	84.6	84.6	82.6	80.6	80.6	78.7	76.7	76.7	74.7
80°	51.1	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	47.2	47.2
82.5°	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7
85°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.9
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0	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



TEST NUMBER: P345501

CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSBZ 4000Lm4000K

**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5
2.5°	1445.2	1449.2	1455.1	1459.0	1461.0	1462.9	1468.8	1474.7	1480.6	1486.5	1490.5
5°	1398.1	1405.9	1413.8	1423.6	1427.5	1433.4	1445.2	1455.1	1464.9	1476.7	1486.5
7.5°	1341.0	1354.8	1368.6	1384.3	1390.2	1396.1	1411.8	1429.5	1443.3	1461.0	1476.7
10°	1282.0	1297.8	1315.5	1337.1	1346.9	1356.8	1376.4	1398.1	1417.7	1439.3	1459.0
12.5°	1215.2	1240.7	1264.3	1287.9	1297.8	1309.6	1335.1	1360.7	1386.3	1411.8	1435.4
15°	1148.3	1173.9	1203.4	1230.9	1244.7	1260.4	1289.9	1321.4	1350.9	1380.4	1407.9
17.5°	1081.5	1107.0	1138.5	1173.9	1191.6	1207.3	1238.8	1274.2	1309.6	1341.0	1376.4
20°	1006.8	1040.2	1077.5	1114.9	1132.6	1152.3	1189.6	1227.0	1266.3	1301.7	1339.1
22.5°	934.0	969.4	1014.6	1052.0	1071.6	1091.3	1134.6	1177.8	1217.2	1256.5	1293.8
25°	861.2	902.5	945.8	991.0	1012.7	1034.3	1079.5	1120.8	1166.0	1207.3	1250.6
27.5°	790.5	833.7	878.9	926.1	949.7	973.3	1018.6	1065.7	1111.0	1156.2	1199.5
30°	723.6	764.9	814.1	863.2	886.8	912.4	959.6	1008.7	1053.9	1099.2	1146.4
32.5°	664.6	700.0	749.2	798.3	823.9	849.5	900.6	949.7	995.0	1042.2	1091.3
35°	609.6	643.0	686.2	737.4	762.9	788.5	839.6	890.7	939.9	985.1	1032.3
37.5°	562.4	591.9	629.2	674.4	703.9	729.5	780.6	831.8	878.9	926.1	971.4
40°	517.1	542.7	578.1	621.4	645.0	670.5	721.6	774.7	821.9	867.1	912.4
42.5°	477.8	499.4	528.9	566.3	591.9	613.5	666.6	717.7	762.9	808.2	853.4
45°	442.4	460.1	483.7	515.2	536.8	564.3	613.5	660.7	705.9	751.1	794.4
47.5°	407.0	422.8	442.4	471.9	489.6	511.2	560.4	605.6	650.9	692.1	733.4
50°	377.5	389.3	405.1	428.7	446.4	462.1	507.3	554.5	595.8	637.1	674.4
52.5°	348.0	355.9	369.7	391.3	403.1	418.8	458.2	501.4	542.7	582.0	615.5
55°	318.5	326.4	336.2	352.0	363.8	375.6	409.0	450.3	487.6	519.1	552.5
57.5°	289.0	294.9	302.8	316.6	324.4	334.3	361.8	395.2	428.7	460.1	485.7
60°	263.5	267.4	273.3	281.2	287.1	293.0	312.6	344.1	375.6	399.2	422.8
62.5°	234.0	236.0	239.9	247.8	251.7	255.6	269.4	296.9	322.5	344.1	363.8
65°	206.5	208.4	210.4	214.3	218.3	220.2	232.0	251.7	273.3	291.0	304.8
67.5°	178.9	180.9	180.9	184.8	184.8	188.8	194.7	206.5	226.1	239.9	251.7
70°	151.4	153.4	153.4	155.3	153.4	155.3	161.2	169.1	180.9	192.7	200.6
72.5°	125.8	123.9	123.9	123.9	123.9	125.8	127.8	131.7	141.6	151.4	153.4
75°	98.3	98.3	96.3	96.3	96.3	96.3	96.3	98.3	104.2	110.1	112.1
77.5°	72.8	70.8	70.8	68.8	68.8	68.8	66.9	66.9	68.8	72.8	72.8
80°	47.2	45.2	43.3	45.2	41.3	43.3	41.3	39.3	39.3	39.3	37.4
82.5°	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	17.7	17.7	17.7
85°	3.9	3.9	5.9	5.9	5.9	5.9	5.9	5.9	7.9	7.9	5.9
87.5°	3.9	3.9	3.9	5.9	5.9	5.9	5.9	5.9	7.9	7.9	7.9
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: P345501

CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSBZ 4000lm4000K

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5
2.5°	1496.4	1502.3	1508.2	1510.1	1512.1	1518.0	1521.9	1527.8	1529.8	1533.7	1537.7
5°	1496.4	1508.2	1518.0	1523.9	1527.8	1537.7	1547.5	1553.4	1563.2	1569.1	1575.0
7.5°	1492.4	1508.2	1521.9	1529.8	1537.7	1549.5	1563.2	1575.0	1586.8	1594.7	1604.5
10°	1480.6	1500.3	1518.0	1527.8	1537.7	1555.4	1571.1	1584.9	1598.6	1610.4	1620.2
12.5°	1462.9	1486.5	1508.2	1520.0	1529.8	1551.4	1569.1	1584.9	1598.6	1608.5	1616.3
15°	1437.4	1466.9	1492.4	1504.2	1516.0	1539.6	1557.3	1571.1	1582.9	1588.8	1594.7
17.5°	1407.9	1439.3	1468.8	1482.6	1494.4	1516.0	1531.8	1541.6	1547.5	1551.4	1549.5
20°	1374.5	1407.9	1437.4	1451.1	1464.9	1482.6	1494.4	1498.3	1496.4	1494.4	1490.5
22.5°	1333.2	1368.6	1400.0	1411.8	1423.6	1437.4	1441.3	1439.3	1435.4	1431.5	1425.6
25°	1289.9	1325.3	1354.8	1364.6	1374.5	1380.4	1378.4	1374.5	1368.6	1362.7	1352.8
27.5°	1240.7	1278.1	1301.7	1313.5	1315.5	1315.5	1309.6	1303.7	1293.8	1286.0	1276.1
30°	1189.6	1221.1	1244.7	1248.6	1250.6	1246.6	1240.7	1230.9	1217.2	1211.3	1201.4
32.5°	1130.6	1164.1	1181.8	1181.8	1177.8	1171.9	1160.1	1150.3	1142.4	1128.7	1118.8
35°	1075.6	1101.1	1111.0	1111.0	1105.1	1095.2	1085.4	1071.6	1059.8	1052.0	1038.2
37.5°	1012.7	1038.2	1042.2	1036.3	1032.3	1020.5	1004.8	993.0	979.2	969.4	959.6
40°	953.7	971.4	967.4	961.5	957.6	945.8	928.1	914.3	900.6	888.8	878.9
42.5°	886.8	898.6	892.7	888.8	880.9	867.1	851.4	837.7	823.9	812.1	802.3
45°	825.9	831.8	821.9	814.1	808.2	792.4	780.6	761.0	747.2	735.4	727.5
47.5°	761.0	761.0	751.1	743.3	733.4	717.7	703.9	684.3	676.4	660.7	652.8
50°	698.0	692.1	680.3	670.5	662.7	645.0	627.3	613.5	599.7	587.9	580.1
52.5°	631.2	623.3	607.6	597.8	593.8	572.2	556.5	538.8	527.0	513.2	505.3
55°	564.3	552.5	534.8	527.0	519.1	501.4	483.7	466.0	454.2	444.4	436.5
57.5°	495.5	481.7	466.0	456.2	446.4	428.7	411.0	395.2	385.4	375.6	369.7
60°	424.7	414.9	399.2	389.3	379.5	363.8	344.1	332.3	324.4	312.6	310.7
62.5°	363.8	350.0	332.3	324.4	316.6	300.8	285.1	275.3	265.5	259.6	251.7
65°	302.8	289.0	273.3	265.5	259.6	245.8	234.0	224.2	216.3	208.4	202.5
67.5°	243.8	234.0	220.2	214.3	206.5	194.7	184.8	177.0	169.1	161.2	155.3
70°	194.7	182.9	171.1	167.1	163.2	151.4	143.5	135.7	127.8	121.9	116.0
72.5°	149.4	139.6	129.8	123.9	119.9	114.0	108.1	100.3	94.4	88.5	84.6
75°	106.2	100.3	92.4	88.5	84.6	80.6	72.8	68.8	66.9	62.9	59.0
77.5°	68.8	62.9	59.0	55.1	55.1	51.1	47.2	45.2	41.3	41.3	39.3
80°	35.4	33.4	31.5	31.5	31.5	27.5	25.6	25.6	23.6	21.6	21.6
82.5°	15.7	15.7	13.8	13.8	13.8	11.8	11.8	9.8	9.8	7.9	7.9
85°	5.9	5.9	5.9	5.9	5.9	3.9	3.9	3.9	2.0	2.0	2.0
87.5°	5.9	5.9	5.9	5.9	5.9	3.9	3.9	3.9	2.0	2.0	2.0
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: P345501

CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSBZ 4000Lm4000K

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5	1488.5
2.5°	1539.6	1543.6	1543.6	1545.5	1547.5	1549.5	1547.5	1549.5
5°	1580.9	1586.8	1588.8	1588.8	1592.7	1594.7	1598.6	1598.6
7.5°	1612.4	1618.3	1622.2	1624.2	1628.1	1632.0	1632.0	1632.0
10°	1628.1	1634.0	1636.0	1639.9	1641.9	1643.8	1645.8	1645.8
12.5°	1622.2	1628.1	1630.1	1630.1	1634.0	1634.0	1634.0	1636.0
15°	1596.7	1594.7	1594.7	1594.7	1592.7	1592.7	1592.7	1590.8
17.5°	1545.5	1543.6	1543.6	1543.6	1541.6	1539.6	1537.7	1533.7
20°	1488.5	1484.6	1480.6	1482.6	1478.7	1476.7	1474.7	1474.7
22.5°	1421.7	1415.8	1413.8	1411.8	1407.9	1405.9	1402.0	1402.0
25°	1348.9	1345.0	1339.1	1337.1	1335.1	1331.2	1327.3	1327.3
27.5°	1272.2	1266.3	1264.3	1260.4	1258.4	1254.5	1252.5	1254.5
30°	1193.6	1187.7	1185.7	1181.8	1173.9	1177.8	1173.9	1171.9
32.5°	1111.0	1105.1	1101.1	1097.2	1097.2	1091.3	1091.3	1089.3
35°	1030.4	1024.5	1020.5	1018.6	1014.6	1014.6	1010.7	1008.7
37.5°	951.7	945.8	941.9	939.9	936.0	932.0	930.1	932.0
40°	871.1	865.2	861.2	859.3	855.3	851.4	851.4	851.4
42.5°	792.4	786.5	786.5	782.6	776.7	774.7	772.8	772.8
45°	719.7	711.8	709.8	705.9	705.9	702.0	700.0	700.0
47.5°	643.0	637.1	635.1	633.2	631.2	629.2	629.2	629.2
50°	572.2	564.3	564.3	560.4	558.4	560.4	556.5	554.5
52.5°	501.4	495.5	493.5	493.5	489.6	489.6	489.6	487.6
55°	430.6	426.7	426.7	424.7	420.8	422.8	422.8	418.8
57.5°	365.7	359.8	359.8	357.9	357.9	357.9	353.9	357.9
60°	304.8	300.8	298.9	296.9	294.9	294.9	294.9	293.0
62.5°	247.8	243.8	241.9	239.9	236.0	236.0	232.0	230.1
65°	196.6	192.7	188.8	186.8	182.9	180.9	180.9	178.9
67.5°	149.4	145.5	141.6	139.6	135.7	133.7	131.7	131.7
70°	112.1	106.2	106.2	104.2	102.2	102.2	100.3	100.3
72.5°	80.6	80.6	78.7	78.7	76.7	76.7	76.7	76.7
75°	57.0	57.0	57.0	57.0	55.1	55.1	53.1	53.1
77.5°	37.4	37.4	37.4	35.4	35.4	35.4	35.4	35.4
80°	19.7	19.7	19.7	19.7	19.7	17.7	19.7	17.7
82.5°	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
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)