

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: P345463

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSMMS 4000Lm3000K**

Issue Date: 03/03/2020

Test Information

Test Method: LM-79-08
Report Number: P345463
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 4000lm3000K
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: 2638.9 lumens
Efficiency: N/A
Efficacy: 58.6 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

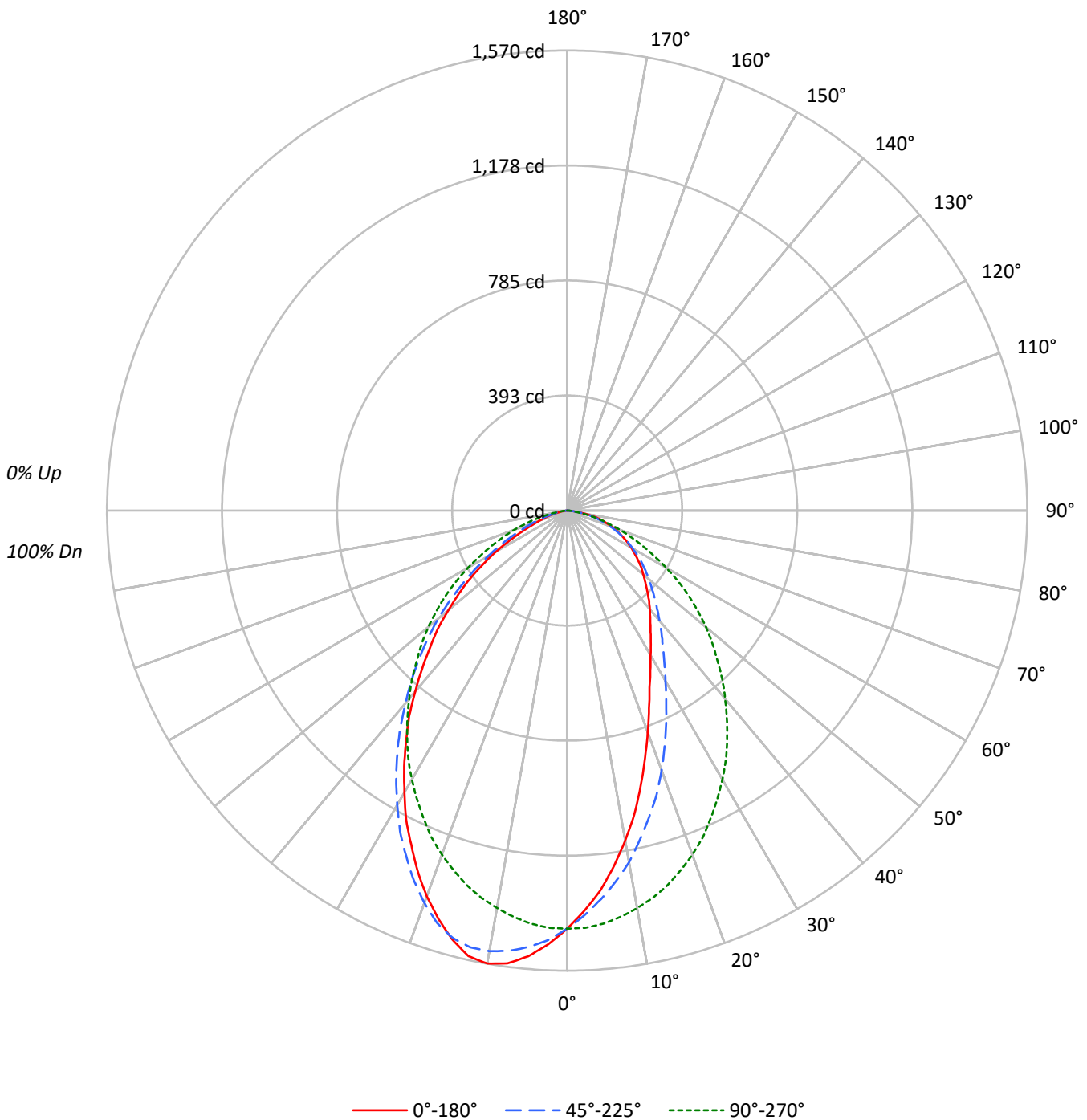
Input Watts (W): 45
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	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°	139014	139014	139014
5°	127199	138440	149318
10°	113004	136310	155330
15°	97910	133465	152857
20°	83447	129568	145208
25°	71531	124620	135352
30°	64044	119174	124902
35°	58964	113216	113882
40°	55851	106676	102605
45°	53242	99993	91158
50°	51429	93715	80282
55°	50260	86129	68509
60°	49216	76037	54732
65°	47805	65169	39111
70°	46703	54226	27925
75°	44696	41872	19882
80°	31710	24302	11618
85°	8387	12636	2125



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	133.5	5.1
10°-20°	361.3	13.7
20°-30°	486.8	18.4
30°-40°	511.2	19.4
40°-50°	460.7	17.5
50°-60°	355.8	13.5
60°-70°	219.0	8.3
70°-80°	96.5	3.7
80°-90°	14.1	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°	981.6	37.2
0°-40°	1492.8	56.6
0°-60°	2309.3	87.5
0°-90°	2638.9	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2638.9	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1426	1426	1426	1426	1426	
5°	1300	1330	1415	1494	1526	119
15°	970	1082	1323	1509	1515	271
25°	665	799	1159	1300	1259	309
35°	496	569	952	1010	957	312
45°	386	422	726	714	661	299
55°	296	311	507	435	403	265
65°	207	207	283	209	170	206
75°	119	106	111	66	53	121
85°	8	9	11	6	2	18
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°	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4
2.5°	1366.1	1364.3	1362.4	1366.1	1366.1	1368.0	1368.0	1371.8	1371.8	1375.6	1381.2
5°	1300.2	1296.4	1298.3	1298.3	1304.0	1304.0	1307.7	1311.5	1317.1	1324.7	1330.3
7.5°	1222.9	1222.9	1224.8	1228.6	1234.2	1234.2	1239.9	1245.5	1255.0	1264.4	1275.7
10°	1141.9	1145.7	1147.6	1151.3	1160.7	1164.5	1166.4	1175.8	1189.0	1198.4	1217.3
12.5°	1060.9	1060.9	1064.6	1072.2	1079.7	1085.4	1089.1	1102.3	1115.5	1132.5	1149.4
15°	970.4	972.3	978.0	985.5	998.7	1002.5	1010.0	1025.1	1043.9	1064.6	1081.6
17.5°	883.7	887.5	891.3	902.6	912.0	917.7	929.0	945.9	966.7	989.3	1015.7
20°	804.6	799.0	806.5	814.0	823.5	836.6	844.2	863.0	885.6	915.8	942.2
22.5°	729.2	729.2	734.9	740.5	750.0	759.4	768.8	783.9	808.4	838.5	868.7
25°	665.2	667.1	672.7	678.4	687.8	693.4	702.9	717.9	742.4	765.0	799.0
27.5°	614.3	616.2	618.1	625.6	633.1	638.8	644.4	659.5	678.4	702.9	731.1
30°	569.1	569.1	571.0	578.5	582.3	589.8	593.6	606.8	623.7	644.4	670.8
32.5°	531.4	531.4	533.3	537.0	544.6	548.3	550.2	563.4	576.6	597.3	618.1
35°	495.6	495.6	497.5	501.2	506.9	508.8	514.4	522.0	535.1	550.2	569.1
37.5°	465.4	465.4	467.3	469.2	473.0	476.7	480.5	488.0	495.6	510.7	529.5
40°	439.0	437.2	439.0	440.9	446.6	446.6	448.5	456.0	463.5	474.9	489.9
42.5°	412.7	412.7	412.7	414.6	418.3	420.2	422.1	425.9	433.4	442.8	454.1
45°	386.3	386.3	388.2	390.1	391.9	393.8	397.6	401.4	405.1	410.8	422.1
47.5°	361.8	363.7	363.7	365.6	367.4	369.3	371.2	375.0	378.7	384.4	391.9
50°	339.2	341.1	341.1	342.9	344.8	344.8	346.7	350.5	354.3	358.0	363.7
52.5°	318.5	318.5	316.6	318.5	320.3	320.3	322.2	324.1	327.9	333.5	337.3
55°	295.8	295.8	295.8	297.7	297.7	297.7	299.6	301.5	303.4	305.3	310.9
57.5°	273.2	273.2	275.1	273.2	275.1	275.1	275.1	277.0	278.9	282.6	284.5
60°	252.5	252.5	252.5	252.5	252.5	252.5	254.4	254.4	254.4	256.3	258.2
62.5°	229.9	229.9	229.9	229.9	229.9	229.9	229.9	229.9	231.8	231.8	233.7
65°	207.3	207.3	209.2	207.3	207.3	207.3	207.3	207.3	207.3	207.3	207.3
67.5°	186.5	184.7	186.5	184.7	184.7	184.7	184.7	182.8	182.8	182.8	180.9
70°	163.9	162.1	162.1	162.1	162.1	160.2	162.1	160.2	158.3	156.4	154.5
72.5°	139.4	139.4	139.4	139.4	139.4	137.6	135.7	135.7	133.8	131.9	130.0
75°	118.7	118.7	116.8	114.9	113.1	113.1	113.1	111.2	109.3	107.4	105.5
77.5°	92.3	90.4	90.4	88.6	86.7	84.8	86.7	84.8	82.9	81.0	79.1
80°	56.5	56.5	56.5	56.5	56.5	56.5	54.6	56.5	54.6	52.8	52.8
82.5°	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4
85°	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	9.4	9.4
87.5°	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	5.7	5.7	5.7
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°	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4
2.5°	1385.0	1388.7	1394.4	1398.2	1400.1	1401.9	1407.6	1413.2	1418.9	1424.6	1428.3
5°	1339.8	1349.2	1354.8	1364.3	1369.9	1375.6	1385.0	1394.4	1403.8	1415.1	1424.6
7.5°	1285.1	1300.2	1311.5	1324.7	1332.2	1339.8	1352.9	1368.0	1383.1	1398.2	1413.2
10°	1232.3	1245.5	1266.3	1285.1	1290.8	1302.1	1322.8	1339.8	1360.5	1377.4	1398.2
12.5°	1172.1	1189.0	1211.6	1234.2	1247.4	1258.7	1283.2	1305.8	1330.3	1352.9	1377.4
15°	1106.1	1132.5	1157.0	1183.4	1200.3	1211.6	1239.9	1268.2	1294.5	1322.8	1351.1
17.5°	1040.1	1070.3	1100.4	1132.5	1145.7	1162.6	1194.7	1224.8	1256.8	1287.0	1319.0
20°	974.2	1006.2	1038.3	1074.1	1092.9	1109.9	1143.8	1179.6	1215.4	1249.3	1283.2
22.5°	904.5	938.4	976.1	1015.7	1036.4	1051.5	1091.0	1130.6	1168.3	1207.9	1243.7
25°	834.8	874.3	913.9	955.4	976.1	998.7	1038.3	1079.7	1119.3	1158.9	1200.3
27.5°	766.9	808.4	849.8	896.9	917.7	940.3	983.6	1025.1	1068.4	1109.9	1151.3
30°	704.7	744.3	789.5	836.6	859.3	881.9	927.1	972.3	1015.7	1059.0	1098.6
32.5°	648.2	682.1	729.2	776.3	800.8	823.5	870.6	917.7	962.9	1008.1	1047.7
35°	595.4	627.5	667.1	717.9	740.5	765.0	814.0	859.3	906.4	951.6	993.0
37.5°	548.3	578.5	614.3	657.6	685.9	708.5	757.5	804.6	849.8	895.1	936.5
40°	506.9	533.3	563.4	603.0	629.4	653.9	702.9	750.0	795.2	838.5	880.0
42.5°	469.2	489.9	518.2	554.0	574.7	599.2	650.1	695.3	740.5	783.9	821.6
45°	433.4	450.4	474.9	506.9	523.8	550.2	597.3	642.6	685.9	725.5	766.9
47.5°	401.4	416.4	435.3	461.7	478.6	499.3	546.5	591.7	633.1	672.7	708.5
50°	373.1	384.4	401.4	424.0	437.2	452.2	499.3	542.7	580.4	618.1	652.0
52.5°	344.8	352.4	365.6	384.4	397.6	410.8	450.4	491.8	529.5	561.5	597.3
55°	314.7	324.1	335.4	348.6	358.0	369.3	401.4	440.9	473.0	506.9	535.1
57.5°	288.3	294.0	301.5	312.8	320.3	329.8	354.3	388.2	420.2	448.5	476.7
60°	261.9	265.7	271.3	278.9	284.5	292.1	309.0	339.2	367.4	390.1	414.6
62.5°	235.5	235.5	239.3	245.0	248.7	254.4	269.5	292.1	316.6	333.5	354.3
65°	207.3	209.2	211.0	214.8	216.7	220.5	229.9	246.8	265.7	282.6	297.7
67.5°	180.9	180.9	182.8	184.7	184.7	186.5	192.2	203.5	222.4	233.7	245.0
70°	154.5	154.5	154.5	154.5	156.4	154.5	158.3	165.8	179.0	190.3	196.0
72.5°	130.0	128.1	126.2	126.2	126.2	126.2	128.1	133.8	141.3	147.0	154.5
75°	103.6	101.8	99.9	98.0	99.9	99.9	99.9	101.8	105.5	111.2	113.1
77.5°	77.3	77.3	73.5	71.6	73.5	71.6	69.7	69.7	71.6	73.5	73.5
80°	52.8	50.9	49.0	47.1	47.1	47.1	45.2	43.3	43.3	43.3	41.5
82.5°	26.4	26.4	24.5	24.5	24.5	24.5	24.5	22.6	22.6	20.7	20.7
85°	9.4	9.4	9.4	9.4	11.3	9.4	11.3	11.3	11.3	11.3	11.3
87.5°	5.7	5.7	7.5	7.5	7.5	7.5	7.5	9.4	9.4	9.4	7.5
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°	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4
2.5°	1434.0	1439.6	1443.4	1447.2	1449.0	1452.8	1458.5	1462.2	1466.0	1469.8	1473.5
5°	1434.0	1445.3	1452.8	1458.5	1464.1	1471.7	1481.1	1488.6	1494.3	1501.8	1507.5
7.5°	1428.3	1443.4	1456.6	1464.1	1471.7	1483.0	1494.3	1505.6	1515.0	1524.4	1532.0
10°	1417.0	1435.9	1454.7	1462.2	1471.7	1486.7	1501.8	1515.0	1526.3	1537.6	1547.0
12.5°	1400.1	1422.7	1445.3	1454.7	1464.1	1483.0	1499.9	1515.0	1526.3	1535.7	1541.4
15°	1377.4	1403.8	1428.3	1439.6	1450.9	1469.8	1486.7	1499.9	1509.3	1515.0	1518.8
17.5°	1349.2	1377.4	1403.8	1417.0	1430.2	1449.0	1462.2	1469.8	1475.4	1475.4	1473.5
20°	1317.1	1347.3	1375.6	1388.7	1400.1	1415.1	1424.6	1426.4	1424.6	1420.8	1417.0
22.5°	1277.6	1311.5	1339.8	1351.1	1360.5	1371.8	1371.8	1369.9	1366.1	1360.5	1358.6
25°	1236.1	1268.2	1296.4	1307.7	1311.5	1319.0	1313.4	1309.6	1300.2	1294.5	1288.9
27.5°	1190.9	1224.8	1245.5	1253.1	1256.8	1253.1	1247.4	1239.9	1234.2	1224.8	1217.3
30°	1141.9	1172.1	1189.0	1194.7	1192.8	1187.1	1181.5	1168.3	1158.9	1149.4	1140.0
32.5°	1085.4	1115.5	1128.7	1130.6	1124.9	1115.5	1106.1	1096.7	1085.4	1074.1	1068.4
35°	1030.7	1057.1	1064.6	1060.9	1055.2	1043.9	1030.7	1019.4	1010.0	996.8	987.4
37.5°	972.3	994.9	994.9	989.3	985.5	972.3	959.1	947.8	934.6	923.3	910.1
40°	913.9	930.9	925.2	919.6	913.9	898.8	887.5	870.6	857.4	844.2	834.8
42.5°	855.5	864.9	857.4	849.8	842.3	827.2	815.9	797.1	785.8	772.6	765.0
45°	797.1	799.0	787.6	782.0	774.5	755.6	740.5	727.3	714.2	699.1	689.7
47.5°	736.8	733.0	719.8	712.3	704.7	687.8	672.7	657.6	642.6	631.2	619.9
50°	676.5	667.1	653.9	646.3	636.9	621.8	604.9	587.9	574.7	563.4	554.0
52.5°	610.5	603.0	587.9	576.6	569.1	548.3	533.3	518.2	503.1	491.8	484.3
55°	544.6	533.3	516.3	508.8	497.5	480.5	465.4	446.6	435.3	425.9	416.4
57.5°	478.6	465.4	450.4	440.9	429.6	412.7	395.7	384.4	373.1	361.8	356.1
60°	414.6	401.4	382.5	378.7	367.4	350.5	335.4	322.2	310.9	303.4	297.7
62.5°	354.3	341.1	322.2	314.7	307.1	290.2	277.0	265.7	258.2	250.6	245.0
65°	294.0	282.6	267.6	258.2	250.6	237.4	226.1	214.8	209.2	199.7	194.1
67.5°	239.3	226.1	214.8	207.3	201.6	188.4	179.0	171.5	163.9	158.3	150.7
70°	188.4	177.1	165.8	162.1	156.4	147.0	139.4	131.9	126.2	120.6	113.1
72.5°	145.1	137.6	126.2	122.5	118.7	111.2	105.5	99.9	92.3	88.6	84.8
75°	107.4	99.9	92.3	88.6	86.7	79.1	75.4	69.7	66.0	64.1	60.3
77.5°	69.7	64.1	60.3	58.4	56.5	52.8	49.0	47.1	43.3	41.5	41.5
80°	39.6	37.7	35.8	33.9	32.0	30.1	30.1	28.3	26.4	24.5	22.6
82.5°	18.8	18.8	17.0	17.0	17.0	15.1	15.1	13.2	13.2	11.3	11.3
85°	9.4	9.4	9.4	9.4	9.4	7.5	7.5	7.5	5.7	5.7	3.8
87.5°	7.5	7.5	7.5	7.5	7.5	5.7	5.7	5.7	3.8	3.8	1.9
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: P345463

CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSMMS 4000lm3000K

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4	1426.4
2.5°	1473.5	1475.4	1477.3	1479.2	1479.2	1481.1	1483.0	1481.1
5°	1511.2	1516.9	1518.8	1520.7	1522.5	1524.4	1526.3	1526.3
7.5°	1539.5	1547.0	1548.9	1548.9	1554.6	1556.5	1558.3	1558.3
10°	1554.6	1558.3	1562.1	1562.1	1565.9	1565.9	1569.6	1569.6
12.5°	1547.0	1550.8	1552.7	1554.6	1554.6	1556.5	1556.5	1556.5
15°	1520.7	1518.8	1518.8	1516.9	1516.9	1515.0	1515.0	1515.0
17.5°	1471.7	1469.8	1467.9	1467.9	1464.1	1464.1	1460.4	1460.4
20°	1413.2	1409.5	1407.6	1405.7	1405.7	1403.8	1400.1	1400.1
22.5°	1351.1	1347.3	1343.5	1339.8	1336.0	1334.1	1332.2	1332.2
25°	1281.3	1275.7	1273.8	1271.9	1266.3	1264.4	1260.6	1258.7
27.5°	1209.7	1200.3	1198.4	1196.5	1192.8	1190.9	1189.0	1189.0
30°	1134.4	1128.7	1124.9	1123.1	1117.4	1115.5	1109.9	1109.9
32.5°	1059.0	1049.6	1045.8	1043.9	1040.1	1036.4	1034.5	1034.5
35°	979.8	974.2	972.3	966.7	961.0	961.0	957.2	957.2
37.5°	904.5	898.8	893.2	891.3	887.5	881.9	880.0	885.6
40°	829.1	821.6	817.8	815.9	812.1	806.5	806.5	806.5
42.5°	755.6	750.0	748.1	744.3	740.5	738.7	734.9	733.0
45°	680.2	676.5	674.6	670.8	668.9	665.2	661.4	661.4
47.5°	614.3	606.8	606.8	603.0	599.2	597.3	597.3	599.2
50°	548.3	542.7	538.9	537.0	533.3	533.3	531.4	529.5
52.5°	476.7	473.0	471.1	471.1	467.3	467.3	465.4	465.4
55°	410.8	410.8	408.9	407.0	403.2	403.2	403.2	403.2
57.5°	352.4	348.6	346.7	344.8	342.9	341.1	341.1	339.2
60°	292.1	290.2	286.4	288.3	282.6	282.6	282.6	280.8
62.5°	237.4	233.7	231.8	229.9	226.1	226.1	222.4	220.5
65°	190.3	184.7	180.9	180.9	177.1	173.4	171.5	169.6
67.5°	143.2	139.4	137.6	135.7	131.9	128.1	128.1	126.2
70°	109.3	105.5	103.6	101.8	99.9	98.0	98.0	98.0
72.5°	81.0	79.1	77.3	77.3	75.4	73.5	73.5	75.4
75°	58.4	56.5	56.5	56.5	54.6	54.6	54.6	52.8
77.5°	39.6	37.7	37.7	35.8	35.8	35.8	35.8	35.8
80°	22.6	20.7	20.7	20.7	20.7	20.7	20.7	20.7
82.5°	9.4	9.4	9.4	9.4	7.5	7.5	7.5	7.5
85°	3.8	3.8	3.8	3.8	3.8	1.9	1.9	1.9
87.5°	1.9	1.9	1.9	1.9	1.9	1.9	0.0	1.9
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)