

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: P345464

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSMMS 4000Lm3500K**

Issue Date: 03/03/2020

Test Information

Test Method: LM-79-08
Report Number: P345464
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 4000lm3500K
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: 2888.8 lumens
Efficiency: N/A
Efficacy: 74.1 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

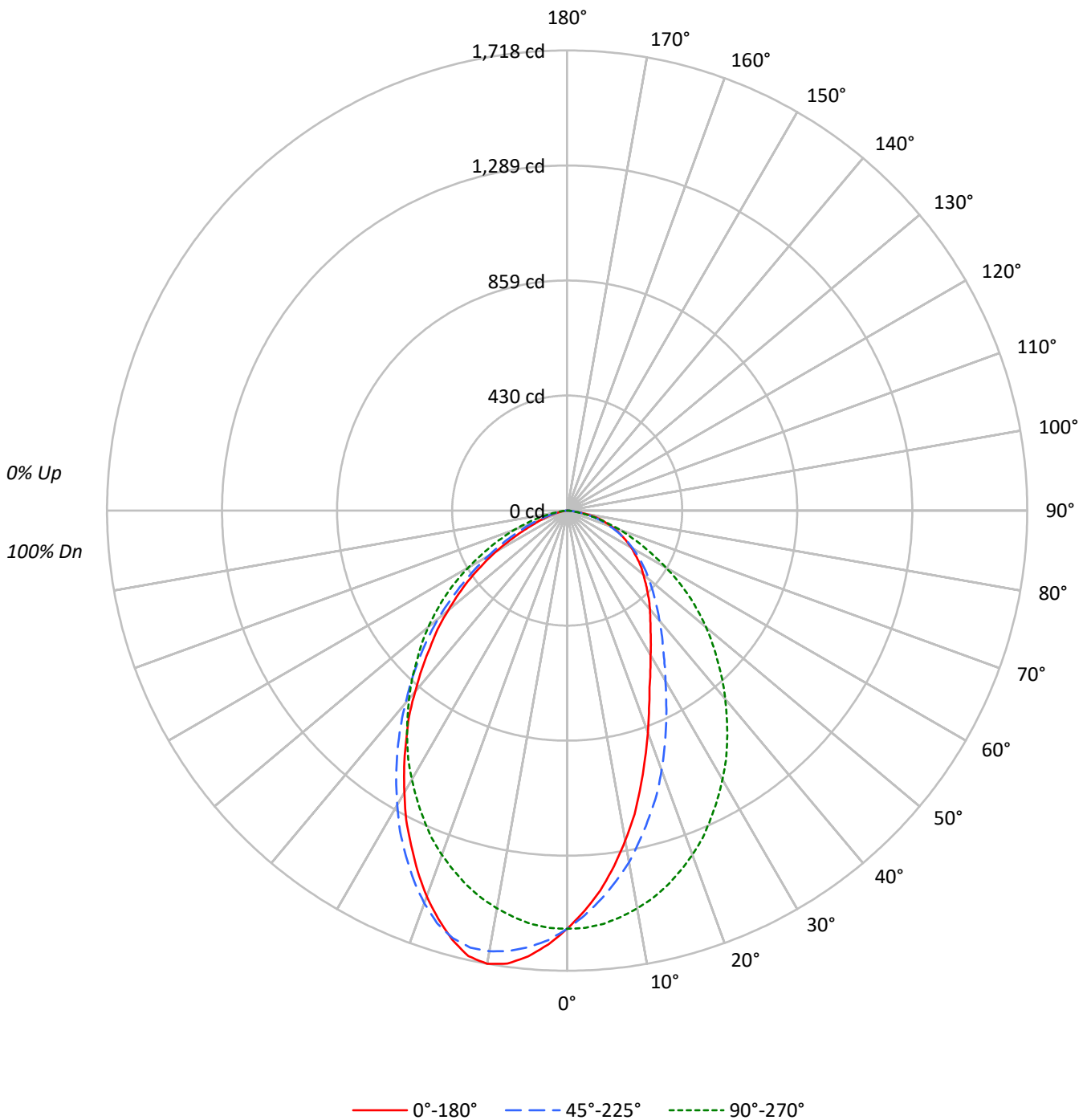
Input Watts (W): 39
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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°	152181	152181	152181
5°	139242	151559	163465
10°	123712	149224	170046
15°	107182	146108	167336
20°	91350	141838	158960
25°	78306	136416	148181
30°	70109	130462	136730
35°	64544	123936	124673
40°	61143	116778	112325
45°	58287	109462	99786
50°	56296	102585	87878
55°	55035	94285	75000
60°	53875	83229	59917
65°	52324	71349	42823
70°	51148	59355	30575
75°	48951	45826	21765
80°	34741	26603	12740
85°	9281	13866	2348



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	146.1	5.1
10°-20°	395.5	13.7
20°-30°	532.9	18.4
30°-40°	559.6	19.4
40°-50°	504.3	17.5
50°-60°	389.5	13.5
60°-70°	239.7	8.3
70°-80°	105.6	3.7
80°-90°	15.5	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°	1074.5	37.2
0°-40°	1634.2	56.6
0°-60°	2528.0	87.5
0°-90°	2888.8	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2888.8	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1562	1562	1562	1562	1562	
5°	1423	1456	1549	1636	1671	131
15°	1062	1184	1448	1652	1658	296
25°	728	875	1269	1423	1378	338
35°	542	623	1042	1106	1048	341
45°	423	462	794	782	724	327
55°	324	340	555	476	441	290
65°	227	227	309	229	186	225
75°	130	116	122	72	58	133
85°	8	10	12	6	2	20
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°	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5
2.5°	1495.5	1493.5	1491.4	1495.5	1495.5	1497.6	1497.6	1501.7	1501.7	1505.8	1512.0
5°	1423.3	1419.2	1421.3	1421.3	1427.5	1427.5	1431.6	1435.7	1441.9	1450.2	1456.3
7.5°	1338.8	1338.8	1340.8	1344.9	1351.1	1351.1	1357.3	1363.5	1373.8	1384.1	1396.5
10°	1250.1	1254.2	1256.2	1260.4	1270.7	1274.8	1276.9	1287.2	1301.6	1311.9	1332.6
12.5°	1161.4	1161.4	1165.5	1173.7	1182.0	1188.2	1192.3	1206.7	1221.2	1239.7	1258.3
15°	1062.3	1064.4	1070.6	1078.8	1093.3	1097.4	1105.7	1122.2	1142.8	1165.5	1184.1
17.5°	967.5	971.6	975.7	988.1	998.4	1004.6	1017.0	1035.5	1058.2	1083.0	1111.9
20°	880.8	874.6	882.9	891.1	901.4	915.9	924.1	944.8	969.5	1002.5	1031.4
22.5°	798.3	798.3	804.5	810.7	821.0	831.3	841.6	858.1	884.9	917.9	951.0
25°	728.2	730.2	736.4	742.6	752.9	759.1	769.4	785.9	812.7	837.5	874.6
27.5°	672.5	674.5	676.6	684.9	693.1	699.3	705.5	722.0	742.6	769.4	800.4
30°	623.0	623.0	625.0	633.3	637.4	645.7	649.8	664.2	682.8	705.5	734.4
32.5°	581.7	581.7	583.8	587.9	596.2	600.3	602.3	616.8	631.2	653.9	676.6
35°	542.5	542.5	544.6	548.7	554.9	557.0	563.1	571.4	585.8	602.3	623.0
37.5°	509.5	509.5	511.6	513.6	517.8	521.9	526.0	534.3	542.5	559.0	579.6
40°	480.6	478.6	480.6	482.7	488.9	488.9	490.9	499.2	507.5	519.8	536.3
42.5°	451.8	451.8	451.8	453.8	457.9	460.0	462.1	466.2	474.4	484.8	497.1
45°	422.9	422.9	424.9	427.0	429.1	431.1	435.3	439.4	443.5	449.7	462.1
47.5°	396.1	398.1	398.1	400.2	402.2	404.3	406.4	410.5	414.6	420.8	429.1
50°	371.3	373.4	373.4	375.4	377.5	377.5	379.6	383.7	387.8	391.9	398.1
52.5°	348.6	348.6	346.6	348.6	350.7	350.7	352.7	354.8	358.9	365.1	369.2
55°	323.9	323.9	323.9	325.9	325.9	325.9	328.0	330.0	332.1	334.2	340.4
57.5°	299.1	299.1	301.2	299.1	301.2	301.2	301.2	303.2	305.3	309.4	311.5
60°	276.4	276.4	276.4	276.4	276.4	276.4	278.5	278.5	278.5	280.5	282.6
62.5°	251.7	251.7	251.7	251.7	251.7	251.7	251.7	251.7	253.7	253.7	255.8
65°	226.9	226.9	229.0	226.9	226.9	226.9	226.9	226.9	226.9	226.9	226.9
67.5°	204.2	202.2	204.2	202.2	202.2	202.2	202.2	200.1	200.1	200.1	198.0
70°	179.5	177.4	177.4	177.4	177.4	175.3	177.4	175.3	173.3	171.2	169.2
72.5°	152.6	152.6	152.6	152.6	152.6	150.6	148.5	148.5	146.5	144.4	142.3
75°	130.0	130.0	127.9	125.8	123.8	123.8	123.8	121.7	119.6	117.6	115.5
77.5°	101.1	99.0	99.0	97.0	94.9	92.8	94.9	92.8	90.8	88.7	86.6
80°	61.9	61.9	61.9	61.9	61.9	61.9	59.8	61.9	59.8	57.8	57.8
82.5°	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
85°	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	10.3	10.3
87.5°	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	6.2	6.2	6.2
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°	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5
2.5°	1516.2	1520.3	1526.5	1530.6	1532.7	1534.7	1540.9	1547.1	1553.3	1559.5	1563.6
5°	1466.7	1477.0	1483.2	1493.5	1499.7	1505.8	1516.2	1526.5	1536.8	1549.2	1559.5
7.5°	1406.8	1423.3	1435.7	1450.2	1458.4	1466.7	1481.1	1497.6	1514.1	1530.6	1547.1
10°	1349.1	1363.5	1386.2	1406.8	1413.0	1425.4	1448.1	1466.7	1489.3	1507.9	1530.6
12.5°	1283.1	1301.6	1326.4	1351.1	1365.6	1378.0	1404.8	1429.5	1456.3	1481.1	1507.9
15°	1210.9	1239.7	1266.6	1295.4	1314.0	1326.4	1357.3	1388.3	1417.1	1448.1	1479.0
17.5°	1138.7	1171.7	1204.7	1239.7	1254.2	1272.8	1307.8	1340.8	1375.9	1408.9	1444.0
20°	1066.5	1101.5	1136.6	1175.8	1196.4	1215.0	1252.1	1291.3	1330.5	1367.6	1404.8
22.5°	990.1	1027.3	1068.5	1111.9	1134.5	1151.0	1194.4	1237.7	1278.9	1322.3	1361.5
25°	913.8	957.1	1000.5	1045.8	1068.5	1093.3	1136.6	1182.0	1225.3	1268.6	1314.0
27.5°	839.6	884.9	930.3	981.9	1004.6	1029.3	1076.8	1122.2	1169.6	1215.0	1260.4
30°	771.5	814.8	864.3	915.9	940.6	965.4	1014.9	1064.4	1111.9	1159.3	1202.6
32.5°	709.6	746.7	798.3	849.9	876.7	901.4	953.0	1004.6	1054.1	1103.6	1146.9
35°	651.8	686.9	730.2	785.9	810.7	837.5	891.1	940.6	992.2	1041.7	1087.1
37.5°	600.3	633.3	672.5	719.9	750.9	775.6	829.2	880.8	930.3	979.8	1025.2
40°	554.9	583.8	616.8	660.1	689.0	715.8	769.4	821.0	870.5	917.9	963.3
42.5°	513.6	536.3	567.3	606.5	629.2	656.0	711.7	761.2	810.7	858.1	899.4
45°	474.4	493.0	519.8	554.9	573.5	602.3	653.9	703.4	750.9	794.2	839.6
47.5°	439.4	455.9	476.5	505.4	524.0	546.6	598.2	647.7	693.1	736.4	775.6
50°	408.4	420.8	439.4	464.1	478.6	495.1	546.6	594.1	635.3	676.6	713.7
52.5°	377.5	385.7	400.2	420.8	435.3	449.7	493.0	538.4	579.6	614.7	653.9
55°	344.5	354.8	367.2	381.6	391.9	404.3	439.4	482.7	517.8	554.9	585.8
57.5°	315.6	321.8	330.0	342.4	350.7	361.0	387.8	424.9	460.0	490.9	521.9
60°	286.7	290.9	297.0	305.3	311.5	319.7	338.3	371.3	402.2	427.0	453.8
62.5°	257.9	257.9	262.0	268.2	272.3	278.5	295.0	319.7	346.6	365.1	387.8
65°	226.9	229.0	231.0	235.2	237.2	241.3	251.7	270.2	290.9	309.4	325.9
67.5°	198.0	198.0	200.1	202.2	202.2	204.2	210.4	222.8	243.4	255.8	268.2
70°	169.2	169.2	169.2	169.2	171.2	169.2	173.3	181.5	196.0	208.3	214.5
72.5°	142.3	140.3	138.2	138.2	138.2	138.2	140.3	146.5	154.7	160.9	169.2
75°	113.5	111.4	109.3	107.3	109.3	109.3	109.3	111.4	115.5	121.7	123.8
77.5°	84.6	84.6	80.4	78.4	80.4	78.4	76.3	76.3	78.4	80.4	80.4
80°	57.8	55.7	53.6	51.6	51.6	51.6	49.5	47.4	47.4	47.4	45.4
82.5°	28.9	28.9	26.8	26.8	26.8	26.8	26.8	24.8	24.8	22.7	22.7
85°	10.3	10.3	10.3	10.3	12.4	10.3	12.4	12.4	12.4	12.4	12.4
87.5°	6.2	6.2	8.3	8.3	8.3	8.3	8.3	10.3	10.3	10.3	8.3
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):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5
2.5°	1569.8	1576.0	1580.1	1584.2	1586.3	1590.4	1596.6	1600.7	1604.9	1609.0	1613.1
5°	1569.8	1582.2	1590.4	1596.6	1602.8	1611.1	1621.4	1629.6	1635.8	1644.1	1650.2
7.5°	1563.6	1580.1	1594.5	1602.8	1611.1	1623.4	1635.8	1648.2	1658.5	1668.8	1677.1
10°	1551.2	1571.9	1592.5	1600.7	1611.1	1627.6	1644.1	1658.5	1670.9	1683.2	1693.6
12.5°	1532.7	1557.4	1582.2	1592.5	1602.8	1623.4	1642.0	1658.5	1670.9	1681.2	1687.4
15°	1507.9	1536.8	1563.6	1576.0	1588.4	1609.0	1627.6	1642.0	1652.3	1658.5	1662.6
17.5°	1477.0	1507.9	1536.8	1551.2	1565.7	1586.3	1600.7	1609.0	1615.2	1615.2	1613.1
20°	1441.9	1474.9	1505.8	1520.3	1532.7	1549.2	1559.5	1561.5	1559.5	1555.4	1551.2
22.5°	1398.6	1435.7	1466.7	1479.0	1489.3	1501.7	1501.7	1499.7	1495.5	1489.3	1487.3
25°	1353.2	1388.3	1419.2	1431.6	1435.7	1444.0	1437.8	1433.7	1423.3	1417.1	1411.0
27.5°	1303.7	1340.8	1363.5	1371.8	1375.9	1371.8	1365.6	1357.3	1351.1	1340.8	1332.6
30°	1250.1	1283.1	1301.6	1307.8	1305.8	1299.6	1293.4	1278.9	1268.6	1258.3	1248.0
32.5°	1188.2	1221.2	1235.6	1237.7	1231.5	1221.2	1210.9	1200.6	1188.2	1175.8	1169.6
35°	1128.4	1157.2	1165.5	1161.4	1155.2	1142.8	1128.4	1116.0	1105.7	1091.2	1080.9
37.5°	1064.4	1089.2	1089.2	1083.0	1078.8	1064.4	1050.0	1037.6	1023.2	1010.8	996.3
40°	1000.5	1019.0	1012.8	1006.6	1000.5	984.0	971.6	953.0	938.6	924.1	913.8
42.5°	936.5	946.8	938.6	930.3	922.1	905.6	893.2	872.6	860.2	845.8	837.5
45°	872.6	874.6	862.3	856.1	847.8	827.2	810.7	796.2	781.8	765.3	755.0
47.5°	806.6	802.4	788.0	779.7	771.5	752.9	736.4	719.9	703.4	691.0	678.7
50°	740.5	730.2	715.8	707.5	697.2	680.7	662.2	643.6	629.2	616.8	606.5
52.5°	668.3	660.1	643.6	631.2	623.0	600.3	583.8	567.3	550.8	538.4	530.1
55°	596.2	583.8	565.2	557.0	544.6	526.0	509.5	488.9	476.5	466.2	455.9
57.5°	524.0	509.5	493.0	482.7	470.3	451.8	433.2	420.8	408.4	396.1	389.9
60°	453.8	439.4	418.7	414.6	402.2	383.7	367.2	352.7	340.4	332.1	325.9
62.5°	387.8	373.4	352.7	344.5	336.2	317.7	303.2	290.9	282.6	274.4	268.2
65°	321.8	309.4	292.9	282.6	274.4	259.9	247.5	235.2	229.0	218.7	212.5
67.5°	262.0	247.5	235.2	226.9	220.7	206.3	196.0	187.7	179.5	173.3	165.0
70°	206.3	193.9	181.5	177.4	171.2	160.9	152.6	144.4	138.2	132.0	123.8
72.5°	158.8	150.6	138.2	134.1	130.0	121.7	115.5	109.3	101.1	97.0	92.8
75°	117.6	109.3	101.1	97.0	94.9	86.6	82.5	76.3	72.2	70.1	66.0
77.5°	76.3	70.1	66.0	63.9	61.9	57.8	53.6	51.6	47.4	45.4	45.4
80°	43.3	41.3	39.2	37.1	35.1	33.0	33.0	30.9	28.9	26.8	24.8
82.5°	20.6	20.6	18.6	18.6	18.6	16.5	16.5	14.4	14.4	12.4	12.4
85°	10.3	10.3	10.3	10.3	10.3	8.3	8.3	8.3	6.2	6.2	4.1
87.5°	8.3	8.3	8.3	8.3	8.3	6.2	6.2	6.2	4.1	4.1	2.1
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: P345464

CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSMMS 4000Lm3500K

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5	1561.5
2.5°	1613.1	1615.2	1617.2	1619.3	1619.3	1621.4	1623.4	1621.4
5°	1654.4	1660.6	1662.6	1664.7	1666.7	1668.8	1670.9	1670.9
7.5°	1685.3	1693.6	1695.6	1695.6	1701.8	1703.9	1705.9	1705.9
10°	1701.8	1705.9	1710.1	1710.1	1714.2	1714.2	1718.3	1718.3
12.5°	1693.6	1697.7	1699.8	1701.8	1701.8	1703.9	1703.9	1703.9
15°	1664.7	1662.6	1662.6	1660.6	1660.6	1658.5	1658.5	1658.5
17.5°	1611.1	1609.0	1606.9	1606.9	1602.8	1602.8	1598.7	1598.7
20°	1547.1	1543.0	1540.9	1538.9	1538.9	1536.8	1532.7	1532.7
22.5°	1479.0	1474.9	1470.8	1466.7	1462.5	1460.5	1458.4	1458.4
25°	1402.7	1396.5	1394.5	1392.4	1386.2	1384.1	1380.0	1378.0
27.5°	1324.3	1314.0	1311.9	1309.9	1305.8	1303.7	1301.6	1301.6
30°	1241.8	1235.6	1231.5	1229.4	1223.2	1221.2	1215.0	1215.0
32.5°	1159.3	1149.0	1144.9	1142.8	1138.7	1134.5	1132.5	1132.5
35°	1072.7	1066.5	1064.4	1058.2	1052.0	1052.0	1047.9	1047.9
37.5°	990.1	984.0	977.8	975.7	971.6	965.4	963.3	969.5
40°	907.6	899.4	895.3	893.2	889.1	882.9	882.9	882.9
42.5°	827.2	821.0	818.9	814.8	810.7	808.6	804.5	802.4
45°	744.7	740.5	738.5	734.4	732.3	728.2	724.0	724.0
47.5°	672.5	664.2	664.2	660.1	656.0	653.9	653.9	656.0
50°	600.3	594.1	590.0	587.9	583.8	583.8	581.7	579.6
52.5°	521.9	517.8	515.7	515.7	511.6	511.6	509.5	509.5
55°	449.7	449.7	447.6	445.6	441.4	441.4	441.4	441.4
57.5°	385.7	381.6	379.6	377.5	375.4	373.4	373.4	371.3
60°	319.7	317.7	313.5	315.6	309.4	309.4	309.4	307.4
62.5°	259.9	255.8	253.7	251.7	247.5	247.5	243.4	241.3
65°	208.3	202.2	198.0	198.0	193.9	189.8	187.7	185.7
67.5°	156.8	152.6	150.6	148.5	144.4	140.3	140.3	138.2
70°	119.6	115.5	113.5	111.4	109.3	107.3	107.3	107.3
72.5°	88.7	86.6	84.6	84.6	82.5	80.4	80.4	82.5
75°	63.9	61.9	61.9	61.9	59.8	59.8	59.8	57.8
77.5°	43.3	41.3	41.3	39.2	39.2	39.2	39.2	39.2
80°	24.8	22.7	22.7	22.7	22.7	22.7	22.7	22.7
82.5°	10.3	10.3	10.3	10.3	8.3	8.3	8.3	8.3
85°	4.1	4.1	4.1	4.1	4.1	2.1	2.1	2.1
87.5°	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)