

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: P345451

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSMMS 2000Lm3000K**

Issue Date: 03/03/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P345451  
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 2000lm3000K  
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: 1439.8 lumens  
Efficiency: N/A  
Efficacy: 65.4 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

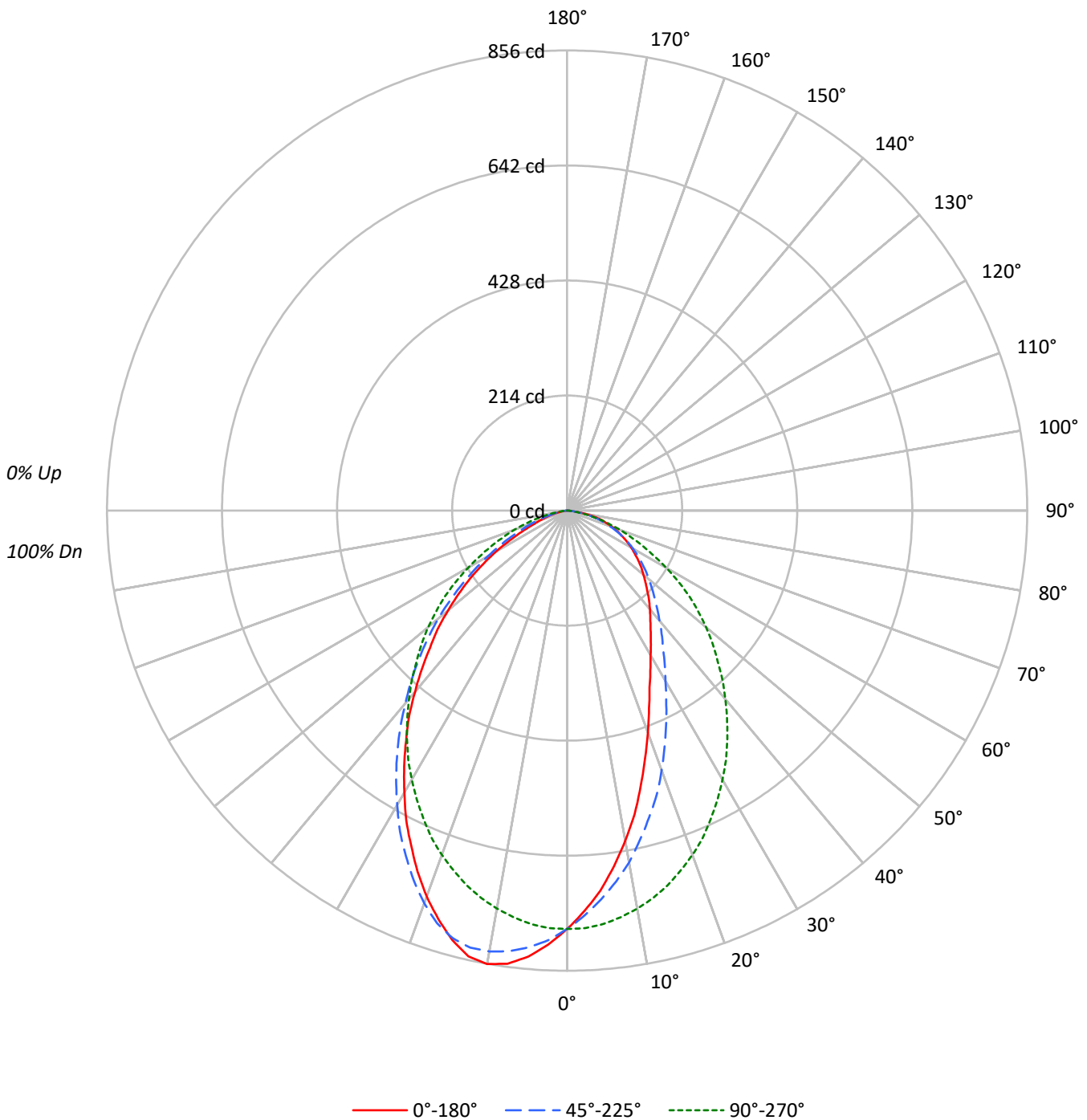
Input Watts (W): 22  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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°	75852	75852	75852
5°	69401	75535	81473
10°	61653	74379	84751
15°	53424	72817	83401
20°	45530	70691	79226
25°	39024	67993	73854
30°	34942	65023	68151
35°	32171	61771	62140
40°	30483	58204	55978
45°	29054	54552	49742
50°	28064	51126	43802
55°	27424	46998	37381
60°	26859	41478	29861
65°	26081	35559	21331
70°	25474	29578	15245
75°	24400	22857	10845
80°	17286	13245	6342
85°	4585	6933	1118



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	72.8	5.1
10°-20°	197.1	13.7
20°-30°	265.6	18.4
30°-40°	278.9	19.4
40°-50°	251.3	17.5
50°-60°	194.1	13.5
60°-70°	119.5	8.3
70°-80°	52.7	3.7
80°-90°	7.7	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°	535.5	37.2
0°-40°	814.5	56.6
0°-60°	1260.0	87.5
0°-90°	1439.8	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1439.8	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	778	778	778	778	778	
5°	709	726	772	815	833	65
15°	530	590	722	824	827	148
25°	363	436	632	709	687	168
35°	270	310	519	551	522	170
45°	211	230	396	390	361	163
55°	161	170	277	238	220	144
65°	113	113	154	114	92	112
75°	65	58	61	36	29	66
85°	4	5	6	3	1	10
90°	0	0	0	0	0	



TEST NUMBER: P345451

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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3
2.5°	745.4	744.4	743.3	745.4	745.4	746.4	746.4	748.5	748.5	750.5	753.6
5°	709.4	707.3	708.4	708.4	711.5	711.5	713.5	715.6	718.7	722.8	725.8
7.5°	667.2	667.2	668.3	670.3	673.4	673.4	676.5	679.6	684.7	689.9	696.0
10°	623.0	625.1	626.1	628.2	633.3	635.4	636.4	641.5	648.7	653.9	664.2
12.5°	578.8	578.8	580.9	585.0	589.1	592.2	594.2	601.4	608.6	617.9	627.1
15°	529.5	530.5	533.6	537.7	544.9	547.0	551.1	559.3	569.6	580.9	590.1
17.5°	482.2	484.2	486.3	492.5	497.6	500.7	506.9	516.1	527.4	539.8	554.2
20°	439.0	435.9	440.0	444.1	449.3	456.5	460.6	470.9	483.2	499.7	514.1
22.5°	397.9	397.9	401.0	404.0	409.2	414.3	419.5	427.7	441.1	457.5	474.0
25°	362.9	364.0	367.0	370.1	375.3	378.3	383.5	391.7	405.1	417.4	435.9
27.5°	335.2	336.2	337.2	341.3	345.4	348.5	351.6	359.8	370.1	383.5	398.9
30°	310.5	310.5	311.5	315.6	317.7	321.8	323.9	331.1	340.3	351.6	366.0
32.5°	289.9	289.9	291.0	293.0	297.1	299.2	300.2	307.4	314.6	325.9	337.2
35°	270.4	270.4	271.4	273.5	276.6	277.6	280.7	284.8	292.0	300.2	310.5
37.5°	253.9	253.9	255.0	256.0	258.1	260.1	262.2	266.3	270.4	278.6	288.9
40°	239.6	238.5	239.6	240.6	243.7	243.7	244.7	248.8	252.9	259.1	267.3
42.5°	225.2	225.2	225.2	226.2	228.2	229.3	230.3	232.4	236.5	241.6	247.8
45°	210.8	210.8	211.8	212.8	213.8	214.9	216.9	219.0	221.0	224.1	230.3
47.5°	197.4	198.4	198.4	199.5	200.5	201.5	202.5	204.6	206.7	209.7	213.8
50°	185.1	186.1	186.1	187.1	188.1	188.1	189.2	191.2	193.3	195.3	198.4
52.5°	173.8	173.8	172.7	173.8	174.8	174.8	175.8	176.8	178.9	182.0	184.0
55°	161.4	161.4	161.4	162.4	162.4	162.4	163.5	164.5	165.5	166.6	169.6
57.5°	149.1	149.1	150.1	149.1	150.1	150.1	150.1	151.1	152.2	154.2	155.2
60°	137.8	137.8	137.8	137.8	137.8	137.8	138.8	138.8	138.8	139.8	140.9
62.5°	125.4	125.4	125.4	125.4	125.4	125.4	125.4	125.4	126.5	126.5	127.5
65°	113.1	113.1	114.1	113.1	113.1	113.1	113.1	113.1	113.1	113.1	113.1
67.5°	101.8	100.8	101.8	100.8	100.8	100.8	100.8	99.7	99.7	99.7	98.7
70°	89.4	88.4	88.4	88.4	88.4	87.4	88.4	87.4	86.4	85.3	84.3
72.5°	76.1	76.1	76.1	76.1	76.1	75.1	74.0	74.0	73.0	72.0	70.9
75°	64.8	64.8	63.7	62.7	61.7	61.7	61.7	60.7	59.6	58.6	57.6
77.5°	50.4	49.3	49.3	48.3	47.3	46.3	47.3	46.3	45.2	44.2	43.2
80°	30.8	30.8	30.8	30.8	30.8	30.8	29.8	30.8	29.8	28.8	28.8
82.5°	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
85°	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	5.1	5.1
87.5°	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.1	3.1	3.1
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°	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3
2.5°	755.7	757.7	760.8	762.9	763.9	764.9	768.0	771.1	774.2	777.3	779.3
5°	731.0	736.1	739.2	744.4	747.4	750.5	755.7	760.8	765.9	772.1	777.3
7.5°	701.2	709.4	715.6	722.8	726.9	731.0	738.2	746.4	754.6	762.9	771.1
10°	672.4	679.6	690.9	701.2	704.3	710.4	721.7	731.0	742.3	751.6	762.9
12.5°	639.5	648.7	661.1	673.4	680.6	686.8	700.1	712.5	725.8	738.2	751.6
15°	603.5	617.9	631.3	645.7	654.9	661.1	676.5	691.9	706.3	721.7	737.2
17.5°	567.5	584.0	600.4	617.9	625.1	634.3	651.8	668.3	685.8	702.2	719.7
20°	531.5	549.0	566.5	586.0	596.3	605.6	624.1	643.6	663.1	681.6	700.1
22.5°	493.5	512.0	532.6	554.2	565.5	573.7	595.3	616.9	637.4	659.0	678.6
25°	455.5	477.0	498.6	521.3	532.6	544.9	566.5	589.1	610.7	632.3	654.9
27.5°	418.4	441.1	463.7	489.4	500.7	513.0	536.7	559.3	582.9	605.6	628.2
30°	384.5	406.1	430.8	456.5	468.8	481.2	505.8	530.5	554.2	577.8	599.4
32.5°	353.7	372.2	397.9	423.6	436.9	449.3	475.0	500.7	525.4	550.0	571.6
35°	324.9	342.4	364.0	391.7	404.0	417.4	444.1	468.8	494.5	519.2	541.8
37.5°	299.2	315.6	335.2	358.8	374.2	386.6	413.3	439.0	463.7	488.4	511.0
40°	276.6	291.0	307.4	329.0	343.4	356.8	383.5	409.2	433.9	457.5	480.1
42.5°	256.0	267.3	282.7	302.3	313.6	326.9	354.7	379.4	404.0	427.7	448.3
45°	236.5	245.7	259.1	276.6	285.8	300.2	325.9	350.6	374.2	395.8	418.4
47.5°	219.0	227.2	237.5	251.9	261.1	272.4	298.2	322.8	345.4	367.0	386.6
50°	203.6	209.7	219.0	231.3	238.5	246.7	272.4	296.1	316.7	337.2	355.7
52.5°	188.1	192.3	199.5	209.7	216.9	224.1	245.7	268.3	288.9	306.4	325.9
55°	171.7	176.8	183.0	190.2	195.3	201.5	219.0	240.6	258.1	276.6	292.0
57.5°	157.3	160.4	164.5	170.7	174.8	179.9	193.3	211.8	229.3	244.7	260.1
60°	142.9	145.0	148.0	152.2	155.2	159.4	168.6	185.1	200.5	212.8	226.2
62.5°	128.5	128.5	130.6	133.7	135.7	138.8	147.0	159.4	172.7	182.0	193.3
65°	113.1	114.1	115.1	117.2	118.2	120.3	125.4	134.7	145.0	154.2	162.4
67.5°	98.7	98.7	99.7	100.8	100.8	101.8	104.9	111.0	121.3	127.5	133.7
70°	84.3	84.3	84.3	84.3	85.3	84.3	86.4	90.5	97.7	103.8	106.9
72.5°	70.9	69.9	68.9	68.9	68.9	68.9	69.9	73.0	77.1	80.2	84.3
75°	56.5	55.5	54.5	53.5	54.5	54.5	54.5	55.5	57.6	60.7	61.7
77.5°	42.2	42.2	40.1	39.1	40.1	39.1	38.0	38.0	39.1	40.1	40.1
80°	28.8	27.8	26.7	25.7	25.7	25.7	24.7	23.6	23.6	23.6	22.6
82.5°	14.4	14.4	13.4	13.4	13.4	13.4	13.4	12.3	12.3	11.3	11.3
85°	5.1	5.1	5.1	5.1	6.2	5.1	6.2	6.2	6.2	6.2	6.2
87.5°	3.1	3.1	4.1	4.1	4.1	4.1	4.1	5.1	5.1	5.1	4.1
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°	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3
2.5°	782.4	785.5	787.5	789.6	790.6	792.7	795.8	797.8	799.9	801.9	804.0
5°	782.4	788.6	792.7	795.8	798.8	803.0	808.1	812.2	815.3	819.4	822.5
7.5°	779.3	787.5	794.7	798.8	803.0	809.1	815.3	821.5	826.6	831.7	835.9
10°	773.1	783.4	793.7	797.8	803.0	811.2	819.4	826.6	832.8	838.9	844.1
12.5°	763.9	776.2	788.6	793.7	798.8	809.1	818.4	826.6	832.8	837.9	841.0
15°	751.6	765.9	779.3	785.5	791.6	801.9	811.2	818.4	823.5	826.6	828.7
17.5°	736.1	751.6	765.9	773.1	780.3	790.6	797.8	801.9	805.0	805.0	804.0
20°	718.7	735.1	750.5	757.7	763.9	772.1	777.3	778.3	777.3	775.2	773.1
22.5°	697.1	715.6	731.0	737.2	742.3	748.5	748.5	747.4	745.4	742.3	741.3
25°	674.4	691.9	707.3	713.5	715.6	719.7	716.6	714.5	709.4	706.3	703.2
27.5°	649.8	668.3	679.6	683.7	685.8	683.7	680.6	676.5	673.4	668.3	664.2
30°	623.0	639.5	648.7	651.8	650.8	647.7	644.6	637.4	632.3	627.1	622.0
32.5°	592.2	608.6	615.8	616.9	613.8	608.6	603.5	598.4	592.2	586.0	582.9
35°	562.4	576.8	580.9	578.8	575.7	569.6	562.4	556.2	551.1	543.9	538.7
37.5°	530.5	542.8	542.8	539.8	537.7	530.5	523.3	517.1	509.9	503.8	496.6
40°	498.6	507.9	504.8	501.7	498.6	490.4	484.2	475.0	467.8	460.6	455.5
42.5°	466.8	471.9	467.8	463.7	459.6	451.3	445.2	434.9	428.7	421.5	417.4
45°	434.9	435.9	429.8	426.7	422.6	412.3	404.0	396.9	389.7	381.4	376.3
47.5°	402.0	399.9	392.7	388.6	384.5	375.3	367.0	358.8	350.6	344.4	338.2
50°	369.1	364.0	356.8	352.6	347.5	339.3	330.0	320.8	313.6	307.4	302.3
52.5°	333.1	329.0	320.8	314.6	310.5	299.2	291.0	282.7	274.5	268.3	264.2
55°	297.1	291.0	281.7	277.6	271.4	262.2	253.9	243.7	237.5	232.4	227.2
57.5°	261.1	253.9	245.7	240.6	234.4	225.2	215.9	209.7	203.6	197.4	194.3
60°	226.2	219.0	208.7	206.7	200.5	191.2	183.0	175.8	169.6	165.5	162.4
62.5°	193.3	186.1	175.8	171.7	167.6	158.3	151.1	145.0	140.9	136.7	133.7
65°	160.4	154.2	146.0	140.9	136.7	129.5	123.4	117.2	114.1	109.0	105.9
67.5°	130.6	123.4	117.2	113.1	110.0	102.8	97.7	93.6	89.4	86.4	82.2
70°	102.8	96.6	90.5	88.4	85.3	80.2	76.1	72.0	68.9	65.8	61.7
72.5°	79.2	75.1	68.9	66.8	64.8	60.7	57.6	54.5	50.4	48.3	46.3
75°	58.6	54.5	50.4	48.3	47.3	43.2	41.1	38.0	36.0	35.0	32.9
77.5°	38.0	35.0	32.9	31.9	30.8	28.8	26.7	25.7	23.6	22.6	22.6
80°	21.6	20.6	19.5	18.5	17.5	16.4	16.4	15.4	14.4	13.4	12.3
82.5°	10.3	10.3	9.3	9.3	9.3	8.2	8.2	7.2	7.2	6.2	6.2
85°	5.1	5.1	5.1	5.1	5.1	4.1	4.1	4.1	3.1	3.1	2.1
87.5°	4.1	4.1	4.1	4.1	4.1	3.1	3.1	3.1	2.1	2.1	1.0
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: P345451

CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSMMS 2000lm3000K

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	778.3	778.3	778.3	778.3	778.3	778.3	778.3	778.3
2.5°	804.0	805.0	806.0	807.1	807.1	808.1	809.1	808.1
5°	824.5	827.6	828.7	829.7	830.7	831.7	832.8	832.8
7.5°	840.0	844.1	845.1	845.1	848.2	849.2	850.2	850.2
10°	848.2	850.2	852.3	852.3	854.4	854.4	856.4	856.4
12.5°	844.1	846.1	847.2	848.2	848.2	849.2	849.2	849.2
15°	829.7	828.7	828.7	827.6	827.6	826.6	826.6	826.6
17.5°	803.0	801.9	800.9	800.9	798.8	798.8	796.8	796.8
20°	771.1	769.0	768.0	767.0	767.0	765.9	763.9	763.9
22.5°	737.2	735.1	733.0	731.0	728.9	727.9	726.9	726.9
25°	699.1	696.0	695.0	694.0	690.9	689.9	687.8	686.8
27.5°	660.0	654.9	653.9	652.9	650.8	649.8	648.7	648.7
30°	618.9	615.8	613.8	612.8	609.7	608.6	605.6	605.6
32.5°	577.8	572.7	570.6	569.6	567.5	565.5	564.4	564.4
35°	534.6	531.5	530.5	527.4	524.3	524.3	522.3	522.3
37.5°	493.5	490.4	487.3	486.3	484.2	481.2	480.1	483.2
40°	452.4	448.3	446.2	445.2	443.1	440.0	440.0	440.0
42.5°	412.3	409.2	408.2	406.1	404.0	403.0	401.0	399.9
45°	371.1	369.1	368.1	366.0	365.0	362.9	360.9	360.9
47.5°	335.2	331.1	331.1	329.0	326.9	325.9	325.9	326.9
50°	299.2	296.1	294.0	293.0	291.0	291.0	289.9	288.9
52.5°	260.1	258.1	257.0	257.0	255.0	255.0	253.9	253.9
55°	224.1	224.1	223.1	222.1	220.0	220.0	220.0	220.0
57.5°	192.3	190.2	189.2	188.1	187.1	186.1	186.1	185.1
60°	159.4	158.3	156.3	157.3	154.2	154.2	154.2	153.2
62.5°	129.5	127.5	126.5	125.4	123.4	123.4	121.3	120.3
65°	103.8	100.8	98.7	98.7	96.6	94.6	93.6	92.5
67.5°	78.1	76.1	75.1	74.0	72.0	69.9	69.9	68.9
70°	59.6	57.6	56.5	55.5	54.5	53.5	53.5	53.5
72.5°	44.2	43.2	42.2	42.2	41.1	40.1	40.1	41.1
75°	31.9	30.8	30.8	30.8	29.8	29.8	29.8	28.8
77.5°	21.6	20.6	20.6	19.5	19.5	19.5	19.5	19.5
80°	12.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
82.5°	5.1	5.1	5.1	5.1	4.1	4.1	4.1	4.1
85°	2.1	2.1	2.1	2.1	2.1	1.0	1.0	1.0
87.5°	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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