

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: P345452

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSMMS 2000Lm3500K**

Issue Date: 03/03/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P345452  
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 2000lm3500K  
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: 1540.0 lumens  
Efficiency: N/A  
Efficacy: 75.5 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

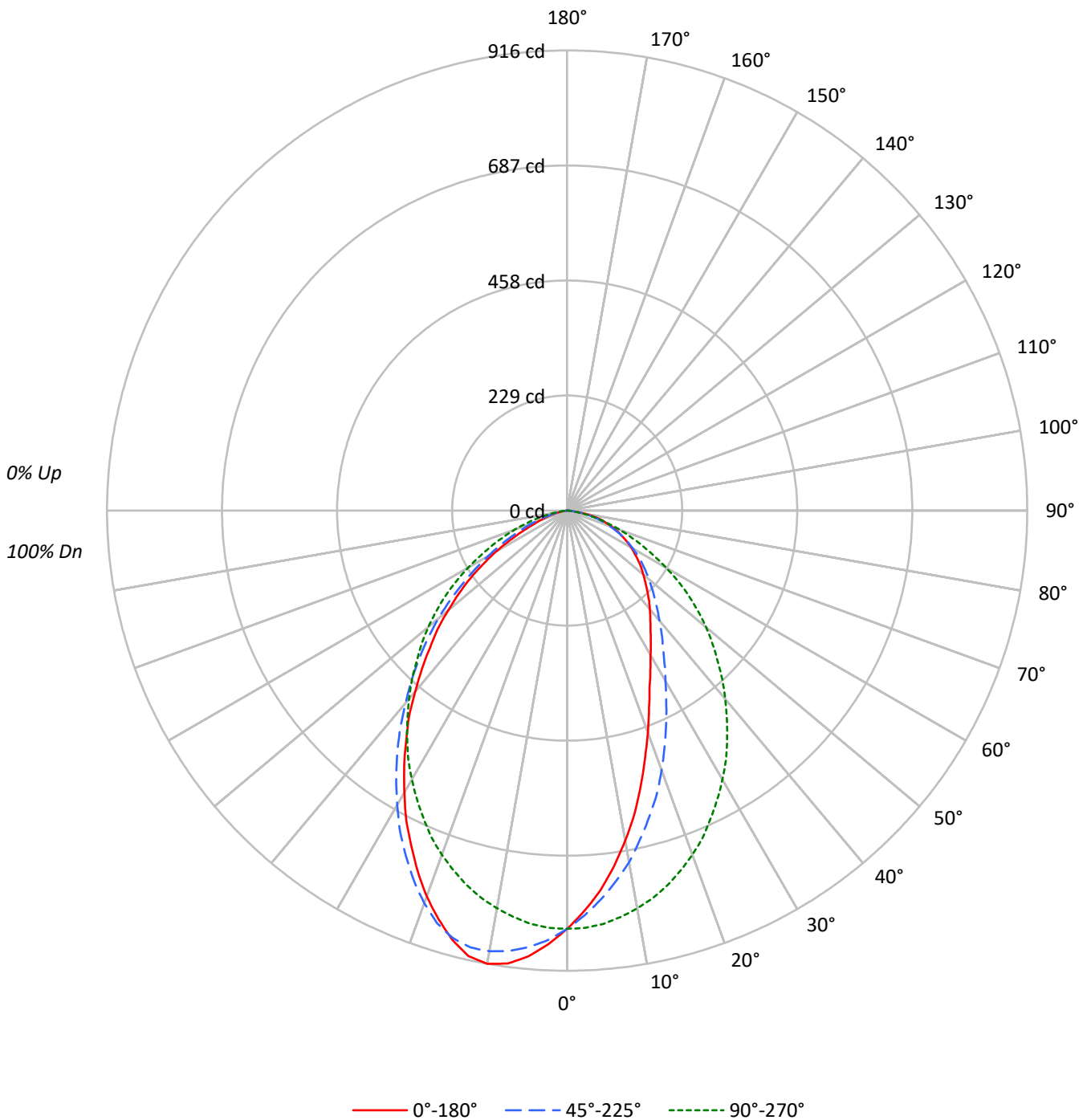
Input Watts (W): 20.4  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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	36	32					31				

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

	0°	90°	180°
0°	81124	81124	81124
5°	74234	80798	87137
10°	65948	79555	90649
15°	57137	77892	89202
20°	48703	75617	84744
25°	41744	72725	78994
30°	37373	69547	72889
35°	34407	66066	66459
40°	32594	62263	59884
45°	31066	58356	53201
50°	30005	54689	46850
55°	29327	50260	39981
60°	28731	44363	31947
65°	27903	38050	22830
70°	27270	31658	16299
75°	26095	24438	11598
80°	18521	14199	6791
85°	4920	7380	1230



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	77.9	5.1
10°-20°	210.8	13.7
20°-30°	284.1	18.4
30°-40°	298.3	19.4
40°-50°	268.8	17.5
50°-60°	207.6	13.5
60°-70°	127.8	8.3
70°-80°	56.3	3.7
80°-90°	8.2	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°	572.8	37.2
0°-40°	871.2	56.6
0°-60°	1347.6	87.5
0°-90°	1540.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1540.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	832	832	832	832	832	
5°	759	776	826	872	891	70
15°	566	631	772	881	884	158
25°	388	466	676	759	735	180
35°	289	332	555	589	559	182
45°	225	246	423	417	386	174
55°	173	181	296	254	235	154
65°	121	121	165	122	99	120
75°	69	62	65	38	31	71
85°	4	6	7	3	1	10
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°	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4
2.5°	797.3	796.2	795.1	797.3	797.3	798.4	798.4	800.6	800.6	802.8	806.1
5°	758.8	756.6	757.7	757.7	761.0	761.0	763.2	765.4	768.7	773.1	776.4
7.5°	713.7	713.7	714.8	717.0	720.3	720.3	723.6	726.9	732.4	737.9	744.5
10°	666.4	668.6	669.7	671.9	677.4	679.6	680.7	686.2	693.9	699.4	710.4
12.5°	619.1	619.1	621.3	625.7	630.1	633.4	635.6	643.3	651.0	660.9	670.8
15°	566.3	567.4	570.7	575.1	582.8	585.0	589.4	598.2	609.2	621.3	631.2
17.5°	515.7	517.9	520.1	526.7	532.2	535.5	542.1	552.0	564.1	577.3	592.7
20°	469.6	466.3	470.7	475.1	480.6	488.3	492.7	503.6	516.8	534.4	549.8
22.5°	425.6	425.6	428.9	432.2	437.7	443.2	448.7	457.5	471.8	489.4	506.9
25°	388.2	389.3	392.6	395.9	401.4	404.7	410.2	419.0	433.3	446.5	466.3
27.5°	358.5	359.6	360.7	365.1	369.5	372.8	376.1	384.9	395.9	410.2	426.7
30°	332.1	332.1	333.2	337.6	339.8	344.2	346.4	354.1	364.0	376.1	391.5
32.5°	310.1	310.1	311.2	313.4	317.8	320.0	321.1	328.8	336.5	348.6	360.7
35°	289.2	289.2	290.3	292.5	295.8	296.9	300.2	304.6	312.3	321.1	332.1
37.5°	271.6	271.6	272.7	273.8	276.0	278.2	280.4	284.8	289.2	298.0	309.0
40°	256.2	255.1	256.2	257.3	260.6	260.6	261.7	266.1	270.5	277.1	285.9
42.5°	240.8	240.8	240.8	241.9	244.1	245.2	246.3	248.5	252.9	258.4	265.0
45°	225.4	225.4	226.5	227.6	228.7	229.8	232.0	234.2	236.4	239.7	246.3
47.5°	211.1	212.2	212.2	213.3	214.4	215.5	216.6	218.8	221.0	224.3	228.7
50°	197.9	199.0	199.0	200.1	201.2	201.2	202.3	204.5	206.7	208.9	212.2
52.5°	185.8	185.8	184.7	185.8	186.9	186.9	188.0	189.1	191.3	194.6	196.8
55°	172.6	172.6	172.6	173.7	173.7	173.7	174.8	175.9	177.0	178.1	181.4
57.5°	159.5	159.5	160.6	159.5	160.6	160.6	160.6	161.7	162.8	165.0	166.1
60°	147.4	147.4	147.4	147.4	147.4	147.4	148.5	148.5	148.5	149.6	150.7
62.5°	134.2	134.2	134.2	134.2	134.2	134.2	134.2	134.2	135.3	135.3	136.4
65°	121.0	121.0	122.1	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
67.5°	108.9	107.8	108.9	107.8	107.8	107.8	107.8	106.7	106.7	106.7	105.6
70°	95.7	94.6	94.6	94.6	94.6	93.5	94.6	93.5	92.4	91.3	90.2
72.5°	81.4	81.4	81.4	81.4	81.4	80.3	79.2	79.2	78.1	77.0	75.9
75°	69.3	69.3	68.2	67.1	66.0	66.0	66.0	64.9	63.8	62.7	61.6
77.5°	53.9	52.8	52.8	51.7	50.6	49.5	50.6	49.5	48.4	47.3	46.2
80°	33.0	33.0	33.0	33.0	33.0	33.0	31.9	33.0	31.9	30.8	30.8
82.5°	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4
85°	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	5.5	5.5
87.5°	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	3.3	3.3	3.3
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°	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4
2.5°	808.3	810.5	813.8	816.0	817.1	818.2	821.5	824.8	828.1	831.4	833.5
5°	781.9	787.4	790.7	796.2	799.5	802.8	808.3	813.8	819.3	825.9	831.4
7.5°	750.0	758.8	765.4	773.1	777.5	781.9	789.6	798.4	807.2	816.0	824.8
10°	719.2	726.9	739.0	750.0	753.3	759.9	772.0	781.9	794.0	803.9	816.0
12.5°	684.0	693.9	707.1	720.3	728.0	734.6	748.9	762.1	776.4	789.6	803.9
15°	645.5	660.9	675.2	690.6	700.5	707.1	723.6	740.1	755.5	772.0	788.5
17.5°	607.0	624.6	642.2	660.9	668.6	678.5	697.2	714.8	733.5	751.1	769.8
20°	568.5	587.2	605.9	626.8	637.8	647.7	667.5	688.4	709.3	729.1	748.9
22.5°	527.8	547.6	569.6	592.7	604.8	613.6	636.7	659.8	681.8	704.9	725.8
25°	487.2	510.2	533.3	557.5	569.6	582.8	605.9	630.1	653.2	676.3	700.5
27.5°	447.6	471.8	496.0	523.4	535.5	548.7	574.0	598.2	623.5	647.7	671.9
30°	411.3	434.4	460.8	488.3	501.4	514.6	541.0	567.4	592.7	618.0	641.1
32.5°	378.3	398.1	425.6	453.1	467.4	480.6	508.0	535.5	561.9	588.3	611.4
35°	347.5	366.2	389.3	419.0	432.2	446.5	475.1	501.4	528.9	555.3	579.5
37.5°	320.0	337.6	358.5	383.8	400.3	413.5	442.1	469.6	496.0	522.3	546.5
40°	295.8	311.2	328.8	351.9	367.3	381.6	410.2	437.7	464.1	489.4	513.5
42.5°	273.8	285.9	302.4	323.3	335.4	349.7	379.4	405.8	432.2	457.5	479.5
45°	252.9	262.8	277.1	295.8	305.7	321.1	348.6	375.0	400.3	423.4	447.6
47.5°	234.2	243.0	254.0	269.4	279.3	291.4	318.9	345.3	369.5	392.6	413.5
50°	217.7	224.3	234.2	247.4	255.1	263.9	291.4	316.7	338.7	360.7	380.5
52.5°	201.2	205.6	213.3	224.3	232.0	239.7	262.8	287.0	309.0	327.7	348.6
55°	183.6	189.1	195.7	203.4	208.9	215.5	234.2	257.3	276.0	295.8	312.3
57.5°	168.2	171.5	175.9	182.5	186.9	192.4	206.7	226.5	245.2	261.7	278.2
60°	152.9	155.1	158.4	162.8	166.1	170.4	180.3	197.9	214.4	227.6	241.9
62.5°	137.5	137.5	139.7	143.0	145.2	148.5	157.3	170.4	184.7	194.6	206.7
65°	121.0	122.1	123.2	125.4	126.5	128.7	134.2	144.1	155.1	165.0	173.7
67.5°	105.6	105.6	106.7	107.8	107.8	108.9	112.2	118.8	129.8	136.4	143.0
70°	90.2	90.2	90.2	90.2	91.3	90.2	92.4	96.8	104.5	111.1	114.4
72.5°	75.9	74.8	73.7	73.7	73.7	73.7	74.8	78.1	82.5	85.8	90.2
75°	60.5	59.4	58.3	57.2	58.3	58.3	58.3	59.4	61.6	64.9	66.0
77.5°	45.1	45.1	42.9	41.8	42.9	41.8	40.7	40.7	41.8	42.9	42.9
80°	30.8	29.7	28.6	27.5	27.5	27.5	26.4	25.3	25.3	25.3	24.2
82.5°	15.4	15.4	14.3	14.3	14.3	14.3	14.3	13.2	13.2	12.1	12.1
85°	5.5	5.5	5.5	5.5	6.6	5.5	6.6	6.6	6.6	6.6	6.6
87.5°	3.3	3.3	4.4	4.4	4.4	4.4	4.4	5.5	5.5	5.5	4.4
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°	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4
2.5°	836.8	840.1	842.3	844.5	845.6	847.8	851.1	853.3	855.5	857.7	859.9
5°	836.8	843.4	847.8	851.1	854.4	858.8	864.3	868.7	872.0	876.4	879.7
7.5°	833.5	842.3	850.0	854.4	858.8	865.4	872.0	878.6	884.1	889.6	894.0
10°	827.0	837.9	848.9	853.3	858.8	867.6	876.4	884.1	890.7	897.3	902.8
12.5°	817.1	830.3	843.4	848.9	854.4	865.4	875.3	884.1	890.7	896.2	899.5
15°	803.9	819.3	833.5	840.1	846.7	857.7	867.6	875.3	880.8	884.1	886.3
17.5°	787.4	803.9	819.3	827.0	834.6	845.6	853.3	857.7	861.0	861.0	859.9
20°	768.7	786.3	802.8	810.5	817.1	825.9	831.4	832.4	831.4	829.2	827.0
22.5°	745.6	765.4	781.9	788.5	794.0	800.6	800.6	799.5	797.3	794.0	792.9
25°	721.4	740.1	756.6	763.2	765.4	769.8	766.5	764.3	758.8	755.5	752.2
27.5°	695.0	714.8	726.9	731.3	733.5	731.3	728.0	723.6	720.3	714.8	710.4
30°	666.4	684.0	693.9	697.2	696.1	692.8	689.5	681.8	676.3	670.8	665.3
32.5°	633.4	651.0	658.7	659.8	656.5	651.0	645.5	640.0	633.4	626.8	623.5
35°	601.5	616.9	621.3	619.1	615.8	609.2	601.5	594.9	589.4	581.7	576.2
37.5°	567.4	580.6	580.6	577.3	575.1	567.4	559.7	553.1	545.4	538.8	531.1
40°	533.3	543.2	539.9	536.6	533.3	524.5	517.9	508.0	500.3	492.7	487.2
42.5°	499.3	504.7	500.3	496.0	491.6	482.8	476.2	465.2	458.6	450.9	446.5
45°	465.2	466.3	459.7	456.4	452.0	441.0	432.2	424.5	416.8	408.0	402.5
47.5°	430.0	427.8	420.1	415.7	411.3	401.4	392.6	383.8	375.0	368.4	361.8
50°	394.8	389.3	381.6	377.2	371.7	362.9	353.0	343.1	335.4	328.8	323.3
52.5°	356.3	351.9	343.1	336.5	332.1	320.0	311.2	302.4	293.6	287.0	282.6
55°	317.8	311.2	301.3	296.9	290.3	280.4	271.6	260.6	254.0	248.5	243.0
57.5°	279.3	271.6	262.8	257.3	250.7	240.8	230.9	224.3	217.7	211.1	207.8
60°	241.9	234.2	223.2	221.0	214.4	204.5	195.7	188.0	181.4	177.0	173.7
62.5°	206.7	199.0	188.0	183.6	179.2	169.3	161.7	155.1	150.7	146.3	143.0
65°	171.5	165.0	156.2	150.7	146.3	138.6	132.0	125.4	122.1	116.6	113.3
67.5°	139.7	132.0	125.4	121.0	117.7	110.0	104.5	100.1	95.7	92.4	88.0
70°	110.0	103.4	96.8	94.6	91.3	85.8	81.4	77.0	73.7	70.4	66.0
72.5°	84.7	80.3	73.7	71.5	69.3	64.9	61.6	58.3	53.9	51.7	49.5
75°	62.7	58.3	53.9	51.7	50.6	46.2	44.0	40.7	38.5	37.4	35.2
77.5°	40.7	37.4	35.2	34.1	33.0	30.8	28.6	27.5	25.3	24.2	24.2
80°	23.1	22.0	20.9	19.8	18.7	17.6	17.6	16.5	15.4	14.3	13.2
82.5°	11.0	11.0	9.9	9.9	9.9	8.8	8.8	7.7	7.7	6.6	6.6
85°	5.5	5.5	5.5	5.5	5.5	4.4	4.4	4.4	3.3	3.3	2.2
87.5°	4.4	4.4	4.4	4.4	4.4	3.3	3.3	3.3	2.2	2.2	1.1
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: P345452

CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSMMS 2000lm3500K

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	832.4	832.4	832.4	832.4	832.4	832.4	832.4	832.4
2.5°	859.9	861.0	862.1	863.2	863.2	864.3	865.4	864.3
5°	881.9	885.2	886.3	887.4	888.5	889.6	890.7	890.7
7.5°	898.4	902.8	903.9	903.9	907.2	908.3	909.4	909.4
10°	907.2	909.4	911.6	911.6	913.8	913.8	916.0	916.0
12.5°	902.8	905.0	906.1	907.2	907.2	908.3	908.3	908.3
15°	887.4	886.3	886.3	885.2	885.2	884.1	884.1	884.1
17.5°	858.8	857.7	856.6	856.6	854.4	854.4	852.2	852.2
20°	824.8	822.6	821.5	820.4	820.4	819.3	817.1	817.1
22.5°	788.5	786.3	784.1	781.9	779.7	778.6	777.5	777.5
25°	747.8	744.5	743.4	742.3	739.0	737.9	735.7	734.6
27.5°	706.0	700.5	699.4	698.3	696.1	695.0	693.9	693.9
30°	662.0	658.7	656.5	655.4	652.1	651.0	647.7	647.7
32.5°	618.0	612.5	610.3	609.2	607.0	604.8	603.7	603.7
35°	571.8	568.5	567.4	564.1	560.8	560.8	558.6	558.6
37.5°	527.8	524.5	521.2	520.1	517.9	514.6	513.5	516.8
40°	483.9	479.5	477.3	476.2	474.0	470.7	470.7	470.7
42.5°	441.0	437.7	436.6	434.4	432.2	431.1	428.9	427.8
45°	397.0	394.8	393.7	391.5	390.4	388.2	386.0	386.0
47.5°	358.5	354.1	354.1	351.9	349.7	348.6	348.6	349.7
50°	320.0	316.7	314.5	313.4	311.2	311.2	310.1	309.0
52.5°	278.2	276.0	274.9	274.9	272.7	272.7	271.6	271.6
55°	239.7	239.7	238.6	237.5	235.3	235.3	235.3	235.3
57.5°	205.6	203.4	202.3	201.2	200.1	199.0	199.0	197.9
60°	170.4	169.3	167.1	168.2	165.0	165.0	165.0	163.9
62.5°	138.6	136.4	135.3	134.2	132.0	132.0	129.8	128.7
65°	111.1	107.8	105.6	105.6	103.4	101.2	100.1	99.0
67.5°	83.6	81.4	80.3	79.2	77.0	74.8	74.8	73.7
70°	63.8	61.6	60.5	59.4	58.3	57.2	57.2	57.2
72.5°	47.3	46.2	45.1	45.1	44.0	42.9	42.9	44.0
75°	34.1	33.0	33.0	33.0	31.9	31.9	31.9	30.8
77.5°	23.1	22.0	22.0	20.9	20.9	20.9	20.9	20.9
80°	13.2	12.1	12.1	12.1	12.1	12.1	12.1	12.1
82.5°	5.5	5.5	5.5	5.5	4.4	4.4	4.4	4.4
85°	2.2	2.2	2.2	2.2	2.2	1.1	1.1	1.1
87.5°	1.1	1.1	1.1	1.1	1.1	1.1	0.0	1.1
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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