

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: P345453

Luminaire Tested: **PR4FS24D010 PR4M24WW9FSMMS 2000Lm4000K**

Issue Date: 03/03/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P345453  
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 2000Lm4000K  
Description: PR4 WALLWASH ASSEMBLY WITH, MATTE METALLIC SILVER FINISH  
Light Source: ARRAY OF HIGH LUMEN LEDs 90CRI / 4000K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1498.5 lumens  
Efficiency: N/A  
Efficacy: 68.1 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

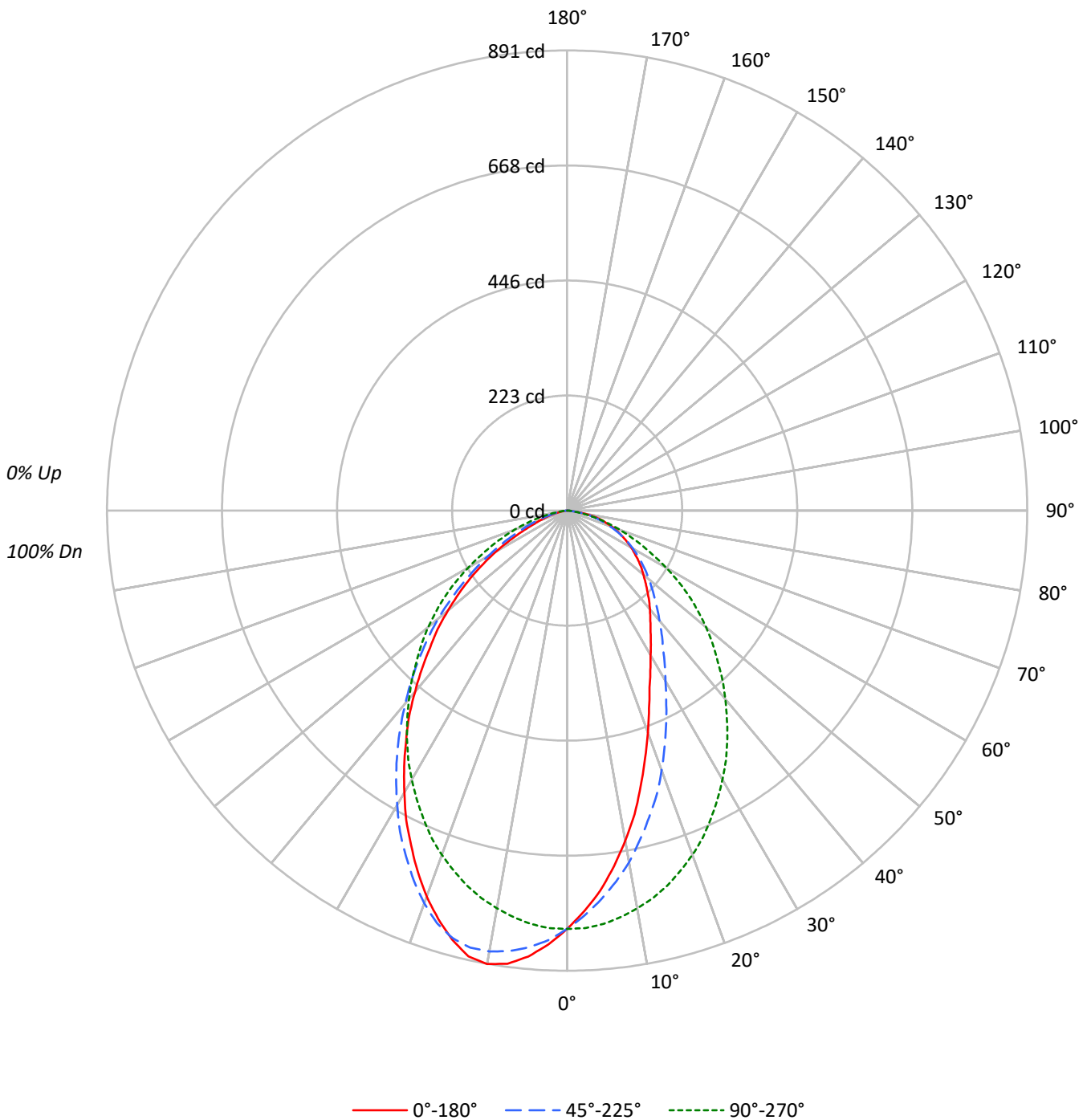
Input Watts (W): 22  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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°	78941	78941	78941
5°	72228	78616	84790
10°	64177	77408	88214
15°	55604	75793	86801
20°	47386	73574	82462
25°	40615	70768	76865
30°	36371	67678	70931
35°	33479	64294	64674
40°	31717	60583	58268
45°	30239	56785	51768
50°	29202	53218	45591
55°	28545	48901	38910
60°	27951	43174	31070
65°	27142	37012	22207
70°	26529	30803	15843
75°	25379	23760	11296
80°	18016	13806	6623
85°	4808	7157	1230



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	75.8	5.1
10°-20°	205.2	13.7
20°-30°	276.4	18.4
30°-40°	290.3	19.4
40°-50°	261.6	17.5
50°-60°	202.1	13.5
60°-70°	124.3	8.3
70°-80°	54.8	3.7
80°-90°	8.0	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°	557.4	37.2
0°-40°	847.7	56.6
0°-60°	1311.4	87.5
0°-90°	1498.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1498.5	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	810	810	810	810	810	
5°	738	756	804	849	867	68
15°	551	614	751	857	860	154
25°	378	454	658	738	715	175
35°	281	323	540	574	544	177
45°	219	240	412	406	376	170
55°	168	177	288	247	229	150
65°	118	118	160	119	96	117
75°	67	60	63	38	30	69
85°	4	5	6	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°	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0
2.5°	775.8	774.7	773.7	775.8	775.8	776.9	776.9	779.0	779.0	781.1	784.4
5°	738.3	736.2	737.3	737.3	740.5	740.5	742.6	744.8	748.0	752.3	755.5
7.5°	694.5	694.5	695.5	697.7	700.9	700.9	704.1	707.3	712.7	718.0	724.4
10°	648.5	650.6	651.7	653.8	659.2	661.3	662.4	667.7	675.2	680.6	691.3
12.5°	602.4	602.4	604.6	608.9	613.1	616.4	618.5	626.0	633.5	643.1	652.7
15°	551.1	552.2	555.4	559.6	567.1	569.3	573.6	582.1	592.8	604.6	614.2
17.5°	501.9	504.0	506.1	512.6	517.9	521.1	527.5	537.2	548.9	561.8	576.8
20°	456.9	453.7	458.0	462.3	467.6	475.1	479.4	490.1	502.9	520.0	535.0
22.5°	414.1	414.1	417.3	420.5	425.9	431.2	436.6	445.1	459.1	476.2	493.3
25°	377.7	378.8	382.0	385.2	390.6	393.8	399.1	407.7	421.6	434.4	453.7
27.5°	348.8	349.9	351.0	355.3	359.5	362.8	366.0	374.5	385.2	399.1	415.2
30°	323.2	323.2	324.2	328.5	330.6	334.9	337.1	344.6	354.2	366.0	380.9
32.5°	301.8	301.8	302.8	305.0	309.2	311.4	312.5	319.9	327.4	339.2	351.0
35°	281.4	281.4	282.5	284.6	287.8	288.9	292.1	296.4	303.9	312.5	323.2
37.5°	264.3	264.3	265.4	266.4	268.6	270.7	272.9	277.1	281.4	290.0	300.7
40°	249.3	248.3	249.3	250.4	253.6	253.6	254.7	259.0	263.2	269.7	278.2
42.5°	234.3	234.3	234.3	235.4	237.6	238.6	239.7	241.8	246.1	251.5	257.9
45°	219.4	219.4	220.4	221.5	222.6	223.6	225.8	227.9	230.1	233.3	239.7
47.5°	205.5	206.5	206.5	207.6	208.7	209.7	210.8	212.9	215.1	218.3	222.6
50°	192.6	193.7	193.7	194.8	195.8	195.8	196.9	199.0	201.2	203.3	206.5
52.5°	180.8	180.8	179.8	180.8	181.9	181.9	183.0	184.1	186.2	189.4	191.5
55°	168.0	168.0	168.0	169.1	169.1	169.1	170.1	171.2	172.3	173.3	176.6
57.5°	155.2	155.2	156.2	155.2	156.2	156.2	156.2	157.3	158.4	160.5	161.6
60°	143.4	143.4	143.4	143.4	143.4	143.4	144.5	144.5	144.5	145.5	146.6
62.5°	130.5	130.5	130.5	130.5	130.5	130.5	130.5	130.5	131.6	131.6	132.7
65°	117.7	117.7	118.8	117.7	117.7	117.7	117.7	117.7	117.7	117.7	117.7
67.5°	105.9	104.9	105.9	104.9	104.9	104.9	104.9	103.8	103.8	103.8	102.7
70°	93.1	92.0	92.0	92.0	92.0	91.0	92.0	91.0	89.9	88.8	87.7
72.5°	79.2	79.2	79.2	79.2	79.2	78.1	77.0	77.0	76.0	74.9	73.8
75°	67.4	67.4	66.3	65.3	64.2	64.2	64.2	63.1	62.1	61.0	59.9
77.5°	52.4	51.4	51.4	50.3	49.2	48.2	49.2	48.2	47.1	46.0	44.9
80°	32.1	32.1	32.1	32.1	32.1	32.1	31.0	32.1	31.0	30.0	30.0
82.5°	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
85°	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	5.4	5.4
87.5°	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.2	3.2	3.2
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°	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0
2.5°	786.5	788.6	791.8	794.0	795.1	796.1	799.3	802.5	805.8	809.0	811.1
5°	760.8	766.2	769.4	774.7	777.9	781.1	786.5	791.8	797.2	803.6	809.0
7.5°	729.8	738.3	744.8	752.3	756.5	760.8	768.3	776.9	785.4	794.0	802.5
10°	699.8	707.3	719.1	729.8	733.0	739.4	751.2	760.8	772.6	782.2	794.0
12.5°	665.6	675.2	688.0	700.9	708.4	714.8	728.7	741.6	755.5	768.3	782.2
15°	628.1	643.1	657.0	672.0	681.6	688.0	704.1	720.2	735.1	751.2	767.2
17.5°	590.7	607.8	624.9	643.1	650.6	660.2	678.4	695.5	713.7	730.9	749.0
20°	553.2	571.4	589.6	609.9	620.6	630.3	649.5	669.9	690.2	709.4	728.7
22.5°	513.6	532.9	554.3	576.8	588.5	597.1	619.6	642.0	663.4	685.9	706.2
25°	474.0	496.5	519.0	542.5	554.3	567.1	589.6	613.1	635.6	658.1	681.6
27.5°	435.5	459.1	482.6	509.3	521.1	534.0	558.6	582.1	606.7	630.3	653.8
30°	400.2	422.7	448.4	475.1	487.9	500.8	526.5	552.2	576.8	601.4	623.8
32.5°	368.1	387.4	414.1	440.9	454.8	467.6	494.4	521.1	546.8	572.5	595.0
35°	338.1	356.3	378.8	407.7	420.5	434.4	462.3	487.9	514.7	540.4	563.9
37.5°	311.4	328.5	348.8	373.5	389.5	402.3	430.2	456.9	482.6	508.3	531.8
40°	287.8	302.8	319.9	342.4	357.4	371.3	399.1	425.9	451.6	476.2	499.7
42.5°	266.4	278.2	294.3	314.6	326.4	340.3	369.2	394.9	420.5	445.1	466.5
45°	246.1	255.7	269.7	287.8	297.5	312.5	339.2	364.9	389.5	412.0	435.5
47.5°	227.9	236.5	247.2	262.2	271.8	283.6	310.3	336.0	359.5	382.0	402.3
50°	211.9	218.3	227.9	240.8	248.3	256.8	283.6	308.2	329.6	351.0	370.2
52.5°	195.8	200.1	207.6	218.3	225.8	233.3	255.7	279.3	300.7	318.9	339.2
55°	178.7	184.1	190.5	198.0	203.3	209.7	227.9	250.4	268.6	287.8	303.9
57.5°	163.7	166.9	171.2	177.6	181.9	187.3	201.2	220.4	238.6	254.7	270.7
60°	148.7	150.9	154.1	158.4	161.6	165.9	175.5	192.6	208.7	221.5	235.4
62.5°	133.8	133.8	135.9	139.1	141.2	144.5	153.0	165.9	179.8	189.4	201.2
65°	117.7	118.8	119.8	122.0	123.1	125.2	130.5	140.2	150.9	160.5	169.1
67.5°	102.7	102.7	103.8	104.9	104.9	105.9	109.1	115.6	126.3	132.7	139.1
70°	87.7	87.7	87.7	87.7	88.8	87.7	89.9	94.2	101.7	108.1	111.3
72.5°	73.8	72.8	71.7	71.7	71.7	71.7	72.8	76.0	80.3	83.5	87.7
75°	58.9	57.8	56.7	55.6	56.7	56.7	56.7	57.8	59.9	63.1	64.2
77.5°	43.9	43.9	41.7	40.7	41.7	40.7	39.6	39.6	40.7	41.7	41.7
80°	30.0	28.9	27.8	26.8	26.8	26.8	25.7	24.6	24.6	24.6	23.5
82.5°	15.0	15.0	13.9	13.9	13.9	13.9	13.9	12.8	12.8	11.8	11.8
85°	5.4	5.4	5.4	5.4	6.4	5.4	6.4	6.4	6.4	6.4	6.4
87.5°	3.2	3.2	4.3	4.3	4.3	4.3	4.3	5.4	5.4	5.4	4.3
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°	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0
2.5°	814.3	817.5	819.7	821.8	822.9	825.0	828.2	830.4	832.5	834.6	836.8
5°	814.3	820.7	825.0	828.2	831.4	835.7	841.1	845.3	848.6	852.8	856.0
7.5°	811.1	819.7	827.2	831.4	835.7	842.1	848.6	855.0	860.3	865.7	870.0
10°	804.7	815.4	826.1	830.4	835.7	844.3	852.8	860.3	866.7	873.2	878.5
12.5°	795.1	807.9	820.7	826.1	831.4	842.1	851.8	860.3	866.7	872.1	875.3
15°	782.2	797.2	811.1	817.5	823.9	834.6	844.3	851.8	857.1	860.3	862.5
17.5°	766.2	782.2	797.2	804.7	812.2	822.9	830.4	834.6	837.9	837.9	836.8
20°	748.0	765.1	781.1	788.6	795.1	803.6	809.0	810.0	809.0	806.8	804.7
22.5°	725.5	744.8	760.8	767.2	772.6	779.0	779.0	777.9	775.8	772.6	771.5
25°	702.0	720.2	736.2	742.6	744.8	749.0	745.8	743.7	738.3	735.1	731.9
27.5°	676.3	695.5	707.3	711.6	713.7	711.6	708.4	704.1	700.9	695.5	691.3
30°	648.5	665.6	675.2	678.4	677.3	674.1	670.9	663.4	658.1	652.7	647.4
32.5°	616.4	633.5	641.0	642.0	638.8	633.5	628.1	622.8	616.4	609.9	606.7
35°	585.3	600.3	604.6	602.4	599.2	592.8	585.3	578.9	573.6	566.1	560.7
37.5°	552.2	565.0	565.0	561.8	559.6	552.2	544.7	538.2	530.7	524.3	516.8
40°	519.0	528.6	525.4	522.2	519.0	510.4	504.0	494.4	486.9	479.4	474.0
42.5°	485.8	491.2	486.9	482.6	478.3	469.8	463.3	452.6	446.2	438.7	434.4
45°	452.6	453.7	447.3	444.1	439.8	429.1	420.5	413.0	405.6	397.0	391.6
47.5°	418.4	416.3	408.8	404.5	400.2	390.6	382.0	373.5	364.9	358.5	352.0
50°	384.2	378.8	371.3	367.0	361.7	353.1	343.5	333.9	326.4	319.9	314.6
52.5°	346.7	342.4	333.9	327.4	323.2	311.4	302.8	294.3	285.7	279.3	275.0
55°	309.2	302.8	293.2	288.9	282.5	272.9	264.3	253.6	247.2	241.8	236.5
57.5°	271.8	264.3	255.7	250.4	244.0	234.3	224.7	218.3	211.9	205.5	202.2
60°	235.4	227.9	217.2	215.1	208.7	199.0	190.5	183.0	176.6	172.3	169.1
62.5°	201.2	193.7	183.0	178.7	174.4	164.8	157.3	150.9	146.6	142.3	139.1
65°	166.9	160.5	151.9	146.6	142.3	134.8	128.4	122.0	118.8	113.4	110.2
67.5°	135.9	128.4	122.0	117.7	114.5	107.0	101.7	97.4	93.1	89.9	85.6
70°	107.0	100.6	94.2	92.0	88.8	83.5	79.2	74.9	71.7	68.5	64.2
72.5°	82.4	78.1	71.7	69.6	67.4	63.1	59.9	56.7	52.4	50.3	48.2
75°	61.0	56.7	52.4	50.3	49.2	44.9	42.8	39.6	37.5	36.4	34.2
77.5°	39.6	36.4	34.2	33.2	32.1	30.0	27.8	26.8	24.6	23.5	23.5
80°	22.5	21.4	20.3	19.3	18.2	17.1	17.1	16.1	15.0	13.9	12.8
82.5°	10.7	10.7	9.6	9.6	9.6	8.6	8.6	7.5	7.5	6.4	6.4
85°	5.4	5.4	5.4	5.4	5.4	4.3	4.3	4.3	3.2	3.2	2.1
87.5°	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2	2.1	2.1	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





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CATALOG NUMBER: PR4FS24D010 PR4M24WW9FSMMS 2000lm4000K

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	810.0	810.0	810.0	810.0	810.0	810.0	810.0	810.0
2.5°	836.8	837.9	838.9	840.0	840.0	841.1	842.1	841.1
5°	858.2	861.4	862.5	863.5	864.6	865.7	866.7	866.7
7.5°	874.2	878.5	879.6	879.6	882.8	883.9	884.9	884.9
10°	882.8	884.9	887.1	887.1	889.2	889.2	891.4	891.4
12.5°	878.5	880.7	881.7	882.8	882.8	883.9	883.9	883.9
15°	863.5	862.5	862.5	861.4	861.4	860.3	860.3	860.3
17.5°	835.7	834.6	833.6	833.6	831.4	831.4	829.3	829.3
20°	802.5	800.4	799.3	798.3	798.3	797.2	795.1	795.1
22.5°	767.2	765.1	763.0	760.8	758.7	757.6	756.5	756.5
25°	727.6	724.4	723.4	722.3	719.1	718.0	715.9	714.8
27.5°	687.0	681.6	680.6	679.5	677.3	676.3	675.2	675.2
30°	644.2	641.0	638.8	637.8	634.5	633.5	630.3	630.3
32.5°	601.4	596.0	593.9	592.8	590.7	588.5	587.5	587.5
35°	556.4	553.2	552.2	548.9	545.7	545.7	543.6	543.6
37.5°	513.6	510.4	507.2	506.1	504.0	500.8	499.7	502.9
40°	470.8	466.5	464.4	463.3	461.2	458.0	458.0	458.0
42.5°	429.1	425.9	424.8	422.7	420.5	419.5	417.3	416.3
45°	386.3	384.2	383.1	380.9	379.9	377.7	375.6	375.6
47.5°	348.8	344.6	344.6	342.4	340.3	339.2	339.2	340.3
50°	311.4	308.2	306.0	305.0	302.8	302.8	301.8	300.7
52.5°	270.7	268.6	267.5	267.5	265.4	265.4	264.3	264.3
55°	233.3	233.3	232.2	231.1	229.0	229.0	229.0	229.0
57.5°	200.1	198.0	196.9	195.8	194.8	193.7	193.7	192.6
60°	165.9	164.8	162.6	163.7	160.5	160.5	160.5	159.4
62.5°	134.8	132.7	131.6	130.5	128.4	128.4	126.3	125.2
65°	108.1	104.9	102.7	102.7	100.6	98.4	97.4	96.3
67.5°	81.3	79.2	78.1	77.0	74.9	72.8	72.8	71.7
70°	62.1	59.9	58.9	57.8	56.7	55.6	55.6	55.6
72.5°	46.0	44.9	43.9	43.9	42.8	41.7	41.7	42.8
75°	33.2	32.1	32.1	32.1	31.0	31.0	31.0	30.0
77.5°	22.5	21.4	21.4	20.3	20.3	20.3	20.3	20.3
80°	12.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
82.5°	5.4	5.4	5.4	5.4	4.3	4.3	4.3	4.3
85°	2.1	2.1	2.1	2.1	2.1	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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