

Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: HALO COMMERCIAL

Report Number: P775713

Luminaire Tested: HCDJBL510CSD-HCD4TSQMW-1000lm-4000K

Issue Date: 2/7/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P775713  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA ( A2310613A001)  
Test Lab:  
Issue Date: 2/7/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO COMMERCIAL  
Catalog Number: HCDJBL510CSD-HCD4TSQMW-1000lm-4000K  
Description: 4 INCH SQUARE MEDIUM MATTE WHITE TRIM  
Light Source: SELECTABLE LUMENS AND CCT ARRAY 90CRI / 4000K CCT  
Ballast/Driver: -

**Summary**

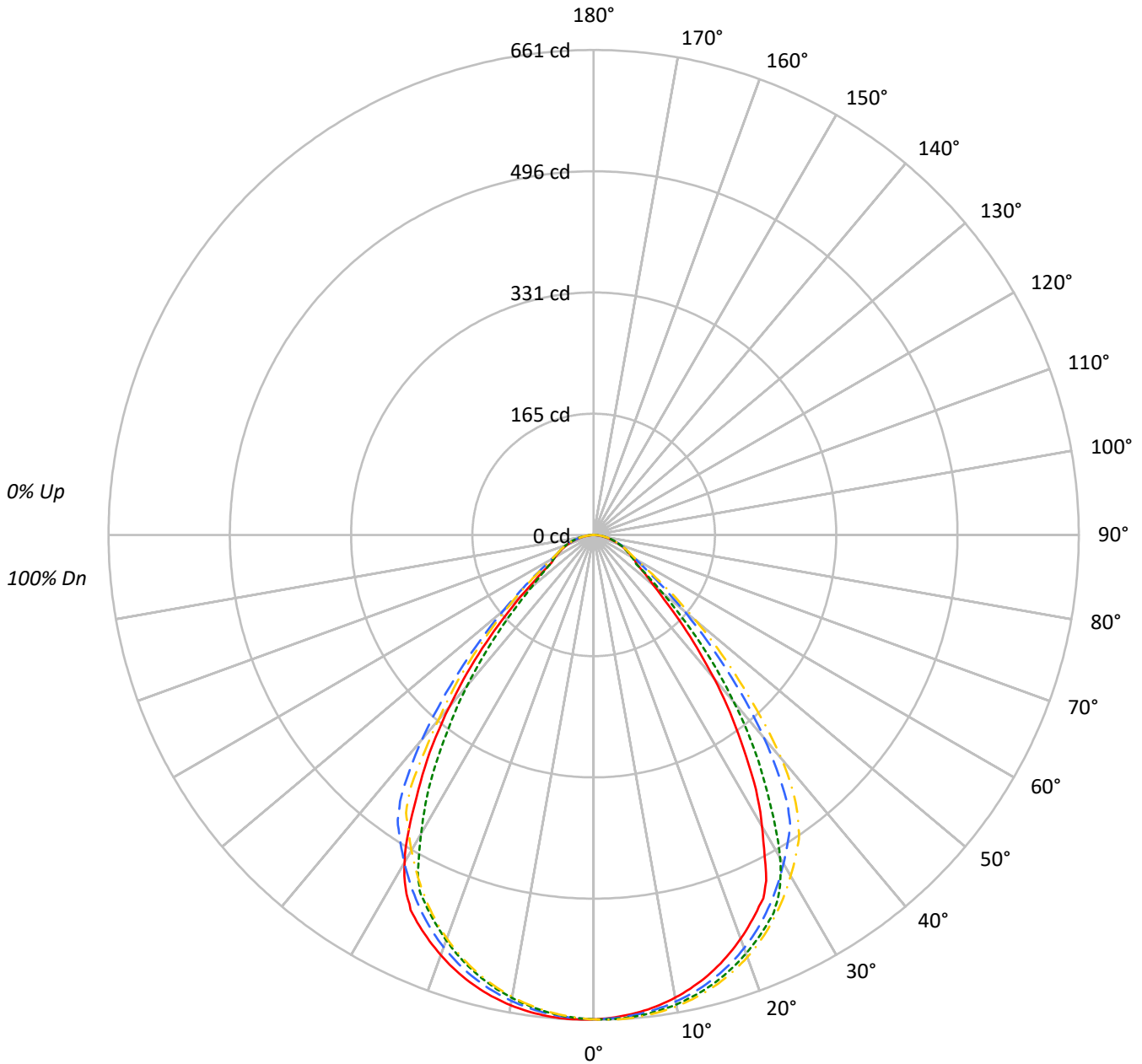
Lumens per Lamp: N/A  
Luminaire Lumens: 1091.7 lumens  
Efficiency: N/A  
Efficacy: 109.2 lumens/watt  
Spacing Criteria (0/90/45): 1.12 / 1.13 / 1.17  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

Input Watts (W): 10  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): 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: 24 FT



TEST NUMBER: P775713  
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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
RCR																				
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100		
1	111	108	104	101	109	106	103	100	101	99	97	98	96	94	94	93	91	89		
2	104	97	92	88	101	96	91	86	92	88	85	89	86	83	86	83	81	79		
3	97	88	82	77	94	87	81	76	84	79	75	81	77	73	79	75	72	70		
4	90	80	73	68	88	79	72	67	77	71	66	75	70	66	73	68	65	63		
5	84	73	66	61	82	72	65	60	70	64	60	69	63	59	67	62	58	57		
6	79	67	60	55	77	67	59	54	65	59	54	63	58	53	62	57	53	51		
7	74	62	55	49	72	61	54	49	60	54	49	59	53	49	57	52	48	47		
8	69	58	50	45	68	57	50	45	56	49	45	55	49	45	53	48	44	43		
9	65	53	46	41	64	53	46	41	52	46	41	51	45	41	50	45	41	39		
10	61	50	43	38	60	49	43	38	48	42	38	48	42	38	47	41	38	36		

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

	0°	90°	180°	270°
0°	65256	65256	65256	65256
5°	64910	65356	65416	64939
10°	64265	65218	65329	64325
15°	63209	64744	64928	63331
20°	61597	63858	64090	61828
25°	59623	62633	62819	59863
30°	52353	57968	58836	53654
35°	42956	48579	49629	44585
40°	32941	38309	39470	34567
45°	23162	27803	28921	24658
50°	16377	18606	19560	16961
55°	12959	12804	13562	13235
60°	12158	11782	11980	12138
65°	11460	11296	11367	11717
70°	10577	10837	10722	11358
75°	9509	10273	9853	10960
80°	7514	9506	8538	10303
85°	3742	7712	5103	9073

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 135°  
 Vertical Angle: 45°  
 Luminance: 39112 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	62.3	5.7
10°-20°	176.3	16.2
20°-30°	257.0	23.5
30°-40°	258.5	23.7
40°-50°	169.5	15.5
50°-60°	82.1	7.5
60°-70°	49.9	4.6
70°-80°	28.7	2.6
80°-90°	7.2	0.7
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°	495.7	45.4
0°-40°	754.2	69.1
0°-60°	1005.8	92.1
0°-90°	1091.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1091.7	100.0

**CANDELA DISTRIBUTION:**

	0°	90°	180°	270°	360°	Flux
0°	660	660	660	660	660	
5°	654	659	659	654	654	62
15°	618	633	634	619	618	174
25°	547	574	576	549	547	246
35°	356	403	411	370	356	222
45°	166	199	207	176	166	130
55°	75	74	79	77	75	70
65°	49	48	49	50	49	48
75°	25	27	26	29	25	26
85°	3	7	4	8	3	5
90°	0	0	0	0	0	



TEST NUMBER: P775713

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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	660.2	660.2	660.2	660.2	660.2	660.2	660.2	660.2	660.2	660.2	660.2
0.5°	660.1	659.8	659.9	659.9	660.4	660.5	660.7	660.8	660.6	660.2	659.8
1°	659.7	659.5	659.8	660.1	660.5	660.7	660.9	661.0	660.7	660.2	659.7
1.5°	659.2	659.2	659.7	660.1	660.5	660.8	661.1	661.1	660.8	660.2	659.5
2°	658.7	658.8	659.5	660.1	660.5	660.8	661.1	661.1	660.8	660.1	659.2
2.5°	658.2	658.4	659.2	659.8	660.4	660.8	661.1	661.1	660.8	659.9	658.9
3°	657.4	657.7	658.8	659.6	660.1	660.7	661.0	661.1	660.6	659.7	658.5
3.5°	656.8	657.1	658.4	659.4	659.8	660.5	660.9	660.9	660.4	659.4	657.9
4°	656.1	656.5	657.8	659.1	659.5	660.3	660.7	660.8	660.2	659.0	657.5
4.5°	655.1	655.6	657.2	658.7	659.2	659.8	660.5	660.5	659.8	658.6	656.9
5°	654.2	654.8	656.5	658.2	658.7	659.5	660.1	660.1	659.3	658.1	656.1
5.5°	653.2	653.9	655.7	657.6	658.2	659.0	659.6	659.6	658.9	657.5	655.3
6°	652.2	652.9	655.0	657.0	657.5	658.4	659.1	659.1	658.3	656.8	654.5
6.5°	651.0	651.9	654.2	656.4	656.8	657.8	658.5	658.5	657.5	656.1	653.5
7°	649.6	650.6	653.2	655.6	656.0	657.1	657.8	657.8	656.9	655.3	652.5
7.5°	648.3	649.3	652.2	654.8	655.1	656.4	657.1	657.0	656.1	654.4	651.4
8°	646.9	648.1	650.9	653.9	654.2	655.5	656.3	656.2	655.2	653.4	650.3
8.5°	645.3	646.5	649.9	652.9	653.2	654.6	655.3	655.3	654.3	652.4	649.0
9°	643.8	645.0	648.6	651.9	652.2	653.6	654.4	654.4	653.2	651.3	647.8
9.5°	642.1	643.4	647.2	650.6	651.0	652.6	653.3	653.2	652.1	650.1	646.4
10°	640.3	641.9	645.8	649.4	649.8	651.3	652.3	652.2	650.9	648.8	644.9
10.5°	638.4	640.1	644.3	648.1	648.4	650.1	651.0	650.9	649.6	647.5	643.3
11°	636.5	638.2	642.7	646.7	647.0	648.7	649.8	649.6	648.4	646.1	641.7
11.5°	634.5	636.3	641.0	645.2	645.4	647.3	648.4	648.2	646.9	644.6	640.0
12°	632.3	634.3	639.2	643.7	643.9	646.0	647.0	646.7	645.3	643.0	638.2
12.5°	630.1	632.2	637.4	642.0	642.2	644.4	645.4	645.1	643.8	641.3	636.3
13°	627.8	630.1	635.5	640.4	640.5	642.6	643.9	643.6	642.1	639.7	634.4
13.5°	625.5	627.8	633.6	638.5	638.7	641.0	642.2	641.8	640.3	637.8	632.3
14°	623.1	625.4	631.4	636.7	636.8	639.1	640.4	640.0	638.4	635.8	630.2
14.5°	620.4	622.9	629.3	634.7	634.8	637.1	638.5	638.2	636.5	633.8	628.0
15°	617.7	620.3	627.0	632.7	632.7	635.3	636.6	636.1	634.5	631.8	625.7
15.5°	614.9	617.7	624.6	630.6	630.6	633.3	634.6	634.1	632.3	629.6	623.3
16°	612.0	615.0	622.1	628.4	628.3	630.9	632.5	631.9	630.1	627.4	620.9
16.5°	609.0	612.1	619.6	626.0	625.9	628.7	630.3	629.7	627.8	625.0	618.2
17°	605.9	609.2	617.1	623.7	623.5	626.3	628.0	627.5	625.5	622.5	615.6
17.5°	602.7	606.1	614.3	621.3	621.0	624.0	625.6	625.1	622.9	620.0	612.9
18°	599.5	603.1	611.5	618.7	618.3	621.5	623.1	622.4	620.2	617.4	610.0
18.5°	596.1	599.7	608.7	616.0	615.7	618.8	620.5	619.8	617.7	614.8	607.1
19°	592.7	596.5	605.6	613.4	612.9	615.9	617.9	617.1	615.0	611.9	604.2
19.5°	589.1	593.0	602.6	610.5	610.0	613.4	615.2	614.2	612.2	609.0	601.1
20°	585.6	589.7	599.4	607.5	607.1	610.4	612.2	611.5	609.3	606.0	597.8
20.5°	582.0	586.1	596.1	604.5	604.0	607.4	609.4	608.5	606.3	603.0	594.5
21°	578.3	582.4	592.7	601.4	600.9	604.4	606.4	605.4	603.2	600.0	591.2



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
22.5°	566.5	571.1	582.1	591.5	591.3	594.8	596.7	596.0	593.6	590.1	580.6
23°	562.5	567.2	578.2	588.3	587.9	591.4	593.3	592.6	590.3	586.6	576.8
23.5°	558.6	563.1	574.3	584.8	584.4	588.1	589.9	589.1	587.0	583.0	572.9
24°	554.2	559.0	570.4	581.2	580.9	584.6	586.3	585.7	583.6	579.5	569.1
24.5°	550.6	555.0	566.4	577.7	577.4	581.0	582.5	582.1	579.9	575.9	565.1
25°	546.7	550.8	562.2	573.9	574.3	577.5	578.7	578.4	576.0	572.2	560.9
25.5°	540.4	546.6	558.0	570.1	570.1	573.8	574.9	574.8	572.4	568.4	556.8
26°	533.4	542.5	553.7	566.3	564.4	569.9	571.0	571.1	568.8	564.5	552.4
26.5°	526.9	538.6	549.4	562.4	559.6	566.2	567.0	567.1	562.4	560.5	548.0
27°	517.2	533.7	545.0	558.3	554.0	562.8	562.9	563.1	557.5	556.3	543.6
27.5°	506.9	526.1	540.5	554.8	547.7	557.9	558.8	559.4	552.0	552.6	539.1
28°	496.7	520.0	535.9	550.8	540.7	552.1	554.4	554.1	545.7	547.8	534.5
28.5°	486.8	511.7	531.2	544.8	533.4	547.3	550.1	548.0	539.0	541.6	530.0
29°	477.2	501.8	526.6	539.4	525.6	541.3	545.8	543.2	531.7	536.5	525.1
29.5°	468.0	491.8	522.0	534.1	517.2	534.8	541.4	537.3	523.9	530.8	520.5
30°	458.7	481.9	517.2	527.9	507.9	528.0	536.9	530.7	515.5	524.4	515.7
30.5°	449.7	472.1	512.4	521.1	498.0	520.7	532.5	523.9	506.5	517.5	510.9
31°	440.7	462.5	507.6	513.8	487.8	512.7	528.0	516.6	496.9	510.3	506.0
31.5°	431.4	453.5	502.7	506.3	477.1	504.8	523.4	508.7	486.4	502.6	501.2
32°	421.3	444.3	497.9	498.2	466.3	495.9	518.6	500.3	475.5	494.5	496.2
32.5°	411.6	435.5	492.9	489.7	455.3	486.3	514.0	491.6	464.7	485.5	491.2
33°	400.9	426.4	488.3	480.3	444.3	476.3	509.2	482.1	453.9	476.3	486.3
33.5°	389.8	417.2	483.7	471.0	433.6	465.9	504.7	472.1	442.8	466.3	481.3
34°	378.1	407.5	479.1	460.9	423.1	455.3	500.1	461.7	431.8	456.1	477.0
34.5°	367.2	397.6	471.8	450.3	412.8	444.7	494.2	451.0	421.4	445.6	471.4
35°	356.0	387.3	463.5	439.7	402.6	434.0	486.7	440.0	411.3	434.7	463.1
35.5°	345.4	376.5	456.3	429.2	392.5	423.5	480.1	429.7	401.5	424.2	455.6
36°	334.9	365.3	447.3	418.8	382.5	413.3	473.4	419.2	391.3	413.9	448.6
36.5°	325.0	354.3	437.0	408.5	372.2	403.2	465.5	408.9	380.9	403.6	439.4
37°	315.0	343.5	426.5	398.1	361.7	393.1	457.3	398.7	371.0	393.5	429.0
37.5°	305.3	333.5	415.6	388.2	350.9	383.4	448.5	389.0	360.4	383.8	418.5
38°	295.7	323.0	404.8	378.4	340.0	373.2	439.3	379.0	349.6	373.9	407.8
38.5°	285.9	313.3	394.0	368.6	329.2	363.3	429.9	369.4	338.4	364.4	396.6
39°	275.8	303.8	383.4	358.8	318.6	353.4	419.7	359.2	327.5	354.6	385.8
39.5°	265.6	294.4	372.7	348.8	307.8	342.9	409.0	349.1	316.8	344.8	374.6
40°	255.3	284.5	361.5	339.1	296.9	332.7	397.9	338.6	305.9	334.8	363.3
40.5°	245.2	275.3	350.4	329.0	286.5	322.1	386.4	328.2	295.4	324.4	351.8
41°	235.4	265.6	339.1	318.7	276.6	311.5	374.4	317.5	285.0	313.9	340.4
41.5°	225.9	256.1	327.9	308.5	266.5	301.3	362.1	307.0	275.2	303.7	329.1
42°	216.4	246.3	316.5	298.2	256.6	291.3	349.7	296.6	265.1	293.5	317.6
42.5°	207.6	236.7	305.0	288.1	246.7	281.2	337.4	286.2	255.3	283.6	306.4
43°	198.9	227.2	293.5	278.1	236.8	271.2	325.5	276.3	245.8	273.7	295.5
43.5°	190.4	217.9	282.0	268.6	227.2	261.5	313.6	266.6	235.9	264.3	283.8



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
45°	165.7	191.9	249.3	240.3	198.9	233.3	279.8	238.0	206.9	236.5	251.9
45.5°	158.0	183.7	238.9	231.3	189.7	223.6	269.4	228.8	197.7	227.8	241.5
46°	150.7	175.6	229.2	222.2	180.8	214.6	259.2	219.4	188.6	218.5	231.6
46.5°	143.6	167.7	219.7	213.3	172.1	205.7	248.8	210.1	179.9	209.5	221.8
47°	136.8	160.0	210.6	204.5	163.9	196.7	238.9	200.9	171.5	200.7	212.6
47.5°	130.7	152.6	201.6	195.7	155.9	188.1	229.1	191.9	163.4	192.1	203.4
48°	125.0	145.4	192.7	187.1	148.3	179.6	219.1	183.3	155.5	183.6	194.4
48.5°	119.9	138.5	184.1	178.5	141.1	171.1	209.7	174.9	148.1	175.4	185.7
49°	115.2	132.0	175.9	170.4	134.1	163.1	199.9	166.9	140.8	167.4	177.3
49.5°	110.6	126.0	167.9	162.6	127.5	155.0	190.6	158.7	134.0	159.8	169.2
50°	106.5	120.2	160.0	155.1	121.0	147.5	181.7	151.2	127.2	152.2	161.4
50.5°	102.9	114.9	152.4	147.7	114.8	140.1	172.8	143.6	120.8	145.1	153.6
51°	99.4	110.2	145.1	140.9	109.1	133.1	164.5	136.6	114.8	138.2	146.5
51.5°	96.0	105.8	138.2	134.0	103.8	126.5	156.4	129.9	109.3	131.7	139.5
52°	92.9	101.9	131.5	127.6	98.8	120.2	148.8	123.6	104.0	125.3	132.9
52.5°	89.7	98.1	125.5	121.1	94.6	114.0	141.1	117.0	99.0	119.0	126.6
53°	86.8	94.7	119.5	115.1	90.4	108.2	134.2	111.1	94.5	113.4	120.5
53.5°	83.6	91.4	113.9	109.1	86.2	102.7	127.2	105.6	90.5	107.7	114.8
54°	80.7	88.4	108.4	103.6	82.0	97.5	120.8	100.3	86.6	102.3	109.4
54.5°	77.9	85.3	103.5	98.3	77.9	93.3	114.5	95.3	82.6	97.3	104.4
55°	75.2	82.4	98.8	93.4	74.3	89.0	108.9	91.1	78.7	93.2	99.7
55.5°	72.9	79.4	94.4	89.0	71.4	84.8	103.1	87.0	75.1	89.1	95.1
56°	71.2	76.6	90.2	84.7	69.2	80.5	97.7	82.9	72.1	85.0	91.3
56.5°	70.0	73.8	86.3	80.8	67.9	76.3	93.4	78.8	69.6	81.0	87.4
57°	68.8	71.3	82.7	77.1	66.6	72.7	89.0	75.1	67.9	76.9	83.5
57.5°	67.6	69.1	79.2	73.7	65.5	69.6	84.7	71.8	66.6	73.4	79.7
58°	66.4	67.7	76.2	70.4	64.3	67.0	80.4	68.9	65.5	70.3	76.7
58.5°	65.2	66.4	73.4	67.8	63.1	65.5	76.0	66.5	64.3	67.8	73.8
59°	64.0	65.1	70.8	66.1	61.9	64.1	72.7	64.9	63.0	65.8	71.0
59.5°	62.7	64.0	68.5	64.7	60.7	62.9	69.8	63.6	61.9	64.4	68.6
60°	61.5	62.8	66.3	63.5	59.6	61.8	67.1	62.4	60.6	63.1	66.3
60.5°	60.1	61.6	64.3	62.3	58.4	60.5	64.8	61.2	59.5	62.0	64.2
61°	58.9	60.3	62.4	61.0	57.3	59.4	62.8	60.0	58.2	60.8	62.3
61.5°	57.7	59.0	60.6	59.8	56.1	58.2	60.8	58.8	56.9	59.6	60.5
62°	56.4	57.8	59.0	58.6	55.1	57.1	59.0	57.6	55.8	58.4	58.8
62.5°	55.1	56.4	57.4	57.5	53.9	55.9	57.4	56.3	54.6	57.2	57.2
63°	53.9	55.2	55.9	56.3	52.7	54.6	55.8	55.2	53.4	55.9	55.7
63.5°	52.6	53.9	54.4	55.1	51.6	53.5	54.3	53.9	52.2	54.7	54.3
64°	51.4	52.6	53.2	53.9	50.5	52.3	52.9	52.6	51.1	53.5	53.0
64.5°	50.1	51.5	51.9	52.7	49.4	51.2	51.6	51.5	49.8	52.2	51.7
65°	49.0	50.1	50.7	51.6	48.3	50.1	50.4	50.2	48.6	51.1	50.4
65.5°	47.7	48.9	49.6	50.4	47.2	49.0	49.2	49.1	47.5	49.8	49.3
66°	46.4	47.7	48.3	49.3	46.1	47.8	48.0	47.8	46.3	48.6	48.1





TEST NUMBER: P775713

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-4000K

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
67.5°	42.8	43.9	44.8	45.8	42.9	44.4	44.5	44.2	42.9	45.1	44.7
68°	41.6	42.7	43.6	44.7	41.8	43.3	43.3	43.1	41.7	43.9	43.5
68.5°	40.3	41.4	42.3	43.5	40.7	42.2	42.1	41.9	40.6	42.7	42.3
69°	39.2	40.2	41.2	42.3	39.6	41.1	41.0	40.8	39.4	41.5	41.1
69.5°	37.7	39.0	39.9	41.3	38.6	39.9	39.8	39.5	38.2	40.3	39.9
70°	36.6	38.1	38.8	40.1	37.5	38.9	38.6	38.4	37.1	39.2	38.8
70.5°	35.5	36.9	37.5	39.0	36.5	37.8	37.4	37.2	36.0	38.0	37.6
71°	34.4	35.6	36.4	38.0	35.4	36.7	36.2	36.0	34.9	36.9	36.5
71.5°	33.3	34.3	35.2	36.9	34.4	35.5	35.1	34.9	33.7	35.6	35.3
72°	32.0	33.0	34.0	35.8	33.3	34.5	33.9	33.7	32.6	34.5	34.1
72.5°	30.9	31.7	32.9	34.7	32.3	33.4	32.8	32.6	31.5	33.3	33.0
73°	29.6	30.6	31.7	33.6	31.1	32.4	31.6	31.4	30.4	32.2	31.8
73.5°	28.5	29.3	30.6	32.5	30.1	31.2	30.6	30.3	29.2	31.0	30.7
74°	27.2	28.2	29.4	31.4	29.1	30.2	29.4	29.1	28.2	29.8	29.5
74.5°	26.1	26.9	28.2	30.3	28.1	29.1	28.3	27.9	27.0	28.7	28.5
75°	24.9	25.6	27.0	29.2	26.9	27.9	27.2	26.8	25.8	27.5	27.3
75.5°	23.7	24.5	25.8	28.1	25.8	26.9	26.1	25.6	24.8	26.4	26.2
76°	22.5	23.2	24.7	27.0	24.8	25.8	24.9	24.5	23.6	25.2	25.0
76.5°	21.3	22.1	23.5	26.0	23.9	24.8	23.9	23.3	22.6	24.2	23.9
77°	20.2	20.8	22.4	24.8	22.8	23.7	22.8	22.2	21.4	23.0	22.7
77.5°	19.0	19.6	21.2	23.7	21.7	22.7	21.7	21.0	20.4	21.9	21.6
78°	17.9	18.4	20.2	22.6	20.7	21.5	20.6	19.9	19.3	20.7	20.5
78.5°	16.7	17.2	19.0	21.5	19.6	20.5	19.5	18.7	18.2	19.5	19.3
79°	15.6	16.0	18.0	20.4	18.7	19.4	18.5	17.5	17.1	18.4	18.3
79.5°	14.4	14.8	16.8	19.3	17.7	18.4	17.4	16.4	16.1	17.3	17.2
80°	13.2	13.7	15.8	18.3	16.7	17.3	16.4	15.3	15.0	16.2	16.2
80.5°	12.2	12.5	14.7	17.1	15.7	16.3	15.4	14.2	14.0	15.0	15.0
81°	11.0	11.2	13.7	16.1	14.7	15.2	14.4	13.1	12.9	13.9	14.1
81.5°	9.9	10.1	12.6	15.0	13.7	14.3	13.4	12.2	11.9	12.8	13.0
82°	8.7	9.0	11.6	14.0	12.7	13.2	12.4	11.1	10.7	11.7	12.0
82.5°	7.7	8.0	10.6	13.0	11.8	12.3	11.5	10.2	9.7	10.5	11.0
83°	6.5	7.0	9.7	12.0	10.8	11.2	10.5	9.2	8.7	9.6	10.1
83.5°	5.4	6.0	8.7	11.0	9.8	10.3	9.7	8.3	7.7	8.5	9.2
84°	4.3	5.1	7.8	10.0	8.8	9.2	8.7	7.4	6.6	7.5	8.4
84.5°	3.8	4.3	6.9	9.0	7.9	8.3	7.9	6.5	5.6	6.5	7.6
85°	3.3	3.7	6.1	8.0	6.8	7.4	6.9	5.6	4.5	5.5	6.7
85.5°	2.6	3.0	5.1	7.0	5.9	6.3	6.1	4.7	3.8	4.6	5.8
86°	2.1	2.5	4.3	6.0	4.9	5.4	5.3	4.1	3.2	4.0	5.0
86.5°	1.6	2.0	3.6	5.0	4.0	4.4	4.4	3.5	2.7	3.5	4.2
87°	1.2	1.4	2.7	4.1	3.0	3.5	3.6	2.8	2.3	2.9	3.4
87.5°	0.6	0.8	2.0	3.2	2.1	2.5	2.7	2.2	1.8	2.3	2.5
88°	0.2	0.3	1.2	2.3	1.3	1.6	1.9	1.7	1.4	1.8	1.8
88.5°	0.0	0.1	0.4	1.4	0.4	0.7	1.1	1.1	0.9	1.3	0.9



TEST NUMBER: P775713

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-4000K

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
90°	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1



TEST NUMBER: P775713

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-4000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
0°	660.2	660.2	660.2	660.2	660.2	660.2
0.5°	659.4	659.9	659.9	660.1	660.2	660.1
1°	659.2	659.6	659.5	659.6	659.8	659.7
1.5°	658.8	659.2	659.0	659.1	659.3	659.2
2°	658.4	658.8	658.5	658.5	658.7	658.7
2.5°	657.8	658.3	657.8	657.8	658.1	658.2
3°	657.2	657.6	657.1	657.1	657.3	657.4
3.5°	656.5	657.0	656.5	656.4	656.6	656.8
4°	655.7	656.2	655.6	655.5	655.7	656.1
4.5°	654.9	655.4	654.7	654.6	654.8	655.1
5°	654.0	654.5	653.6	653.6	653.9	654.2
5.5°	653.0	653.5	652.6	652.5	652.8	653.2
6°	652.0	652.4	651.4	651.3	651.6	652.2
6.5°	650.8	651.2	650.3	650.2	650.4	651.0
7°	649.5	650.0	648.9	648.8	649.1	649.6
7.5°	648.2	648.7	647.5	647.4	647.7	648.3
8°	646.8	647.2	646.1	646.0	646.3	646.9
8.5°	645.3	645.8	644.5	644.4	644.7	645.3
9°	643.9	644.2	642.9	642.7	643.0	643.8
9.5°	642.2	642.5	641.2	641.0	641.3	642.1
10°	640.4	640.9	639.5	639.1	639.6	640.3
10.5°	638.6	639.1	637.6	637.4	637.6	638.4
11°	636.7	637.1	635.7	635.4	635.7	636.5
11.5°	634.8	635.1	633.6	633.3	633.7	634.5
12°	632.7	633.2	631.5	631.2	631.5	632.3
12.5°	630.6	630.9	629.3	628.9	629.2	630.1
13°	628.4	628.7	627.0	626.6	627.0	627.8
13.5°	626.0	626.4	624.6	624.3	624.5	625.5
14°	623.7	624.0	622.1	621.8	622.1	623.1
14.5°	621.2	621.5	619.6	619.2	619.4	620.4
15°	618.7	618.9	617.0	616.6	616.7	617.7
15.5°	615.9	616.1	614.1	613.8	613.8	614.9
16°	613.2	613.4	611.3	611.0	611.1	612.0
16.5°	610.2	610.6	608.5	608.0	608.1	609.0
17°	607.3	607.5	605.5	605.1	605.1	605.9
17.5°	604.3	604.5	602.4	601.9	601.8	602.7
18°	601.2	601.2	599.2	598.8	598.7	599.5
18.5°	597.8	598.0	595.9	595.6	595.3	596.1
19°	594.6	594.7	592.5	592.2	591.9	592.7
19.5°	591.2	591.2	589.0	588.8	588.4	589.1
20°	587.7	587.8	585.5	585.2	584.7	585.6
20.5°	584.1	584.2	581.9	581.5	581.0	582.0
21°	580.4	580.5	578.1	577.9	577.3	578.3



TEST NUMBER: P775713

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-4000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
22.5°	569.0	569.2	566.4	565.9	565.5	566.5
23°	565.0	565.2	562.4	561.9	561.5	562.5
23.5°	561.1	561.1	558.4	557.5	557.4	558.6
24°	557.0	557.1	554.2	553.3	553.2	554.2
24.5°	552.8	552.9	549.9	548.9	548.9	550.6
25°	548.5	548.9	545.7	544.5	544.5	546.7
25.5°	544.3	545.2	541.3	539.7	540.3	540.4
26°	540.1	540.3	536.9	535.4	535.8	533.4
26.5°	536.3	532.8	532.6	530.5	531.9	526.9
27°	532.0	527.0	528.7	526.0	527.7	517.2
27.5°	525.1	518.8	524.1	521.0	521.0	506.9
28°	518.3	509.0	517.2	516.2	514.2	496.7
28.5°	511.8	499.0	510.4	511.3	507.4	486.8
29°	502.8	489.2	503.9	506.4	498.0	477.2
29.5°	493.0	479.4	494.7	501.2	488.2	468.0
30°	483.2	470.1	485.2	496.4	478.0	458.7
30.5°	473.7	460.4	475.1	491.3	468.4	449.7
31°	464.3	451.2	465.8	486.3	458.8	440.7
31.5°	454.7	441.8	456.1	481.1	449.5	431.4
32°	445.5	432.4	447.0	476.0	440.6	421.3
32.5°	436.3	422.5	437.9	470.9	431.9	411.6
33°	427.1	412.5	428.8	466.1	423.0	400.9
33.5°	417.8	402.1	419.7	461.8	414.4	389.8
34°	408.0	391.4	410.6	457.1	405.3	378.1
34.5°	398.2	380.6	401.1	449.3	395.9	367.2
35°	388.2	369.5	391.3	440.0	385.8	356.0
35.5°	377.8	358.5	381.4	433.1	375.9	345.4
36°	367.3	348.0	371.0	423.1	365.2	334.9
36.5°	356.6	337.4	360.8	410.7	354.8	325.0
37°	346.1	327.4	350.3	398.3	343.9	315.0
37.5°	335.7	317.3	340.0	386.0	333.7	305.3
38°	325.6	307.4	329.6	373.8	323.6	295.7
38.5°	315.8	297.7	319.9	362.2	313.9	285.9
39°	305.9	288.1	310.1	350.8	304.5	275.8
39.5°	296.3	278.0	300.9	339.9	295.2	265.6
40°	286.9	267.9	291.5	329.4	286.2	255.3
40.5°	277.8	258.2	282.1	319.3	277.2	245.2
41°	268.1	248.2	272.9	309.4	268.0	235.4
41.5°	258.7	238.4	263.7	299.6	258.6	225.9
42°	249.1	228.8	254.3	289.9	249.2	216.4
42.5°	239.9	219.6	244.8	280.5	240.0	207.6
43°	230.4	210.5	235.6	270.9	230.6	198.9
43.5°	221.1	201.6	226.2	261.0	221.5	190.4

TEST NUMBER: P775713

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-4000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
45°	195.0	176.4	199.8	231.5	195.6	165.7
45.5°	187.0	168.4	191.8	222.1	187.7	158.0
46°	178.7	160.5	183.7	213.1	179.7	150.7
46.5°	170.8	152.9	175.6	204.2	171.9	143.6
47°	163.2	145.6	167.9	195.7	164.3	136.8
47.5°	155.7	138.5	160.0	187.8	157.0	130.7
48°	148.3	132.2	152.6	180.2	149.7	125.0
48.5°	141.3	125.9	145.5	172.9	142.8	119.9
49°	134.4	120.3	138.7	165.7	136.2	115.2
49.5°	128.1	115.2	132.2	158.9	130.0	110.6
50°	121.8	110.3	126.0	152.1	124.2	106.5
50.5°	116.2	105.9	120.3	145.6	118.7	102.9
51°	111.0	102.0	114.8	139.3	113.8	99.4
51.5°	106.1	98.3	110.1	133.1	109.2	96.0
52°	101.7	95.0	105.8	127.2	105.0	92.9
52.5°	97.7	91.7	101.6	121.6	101.1	89.7
53°	94.0	88.6	97.8	116.2	97.4	86.8
53.5°	90.9	85.5	94.2	111.1	93.9	83.6
54°	87.8	82.5	90.8	106.2	90.7	80.7
54.5°	84.8	79.6	87.8	101.6	87.5	77.9
55°	81.6	76.8	84.7	97.3	84.7	75.2
55.5°	78.6	74.1	81.6	93.2	81.6	72.9
56°	75.9	71.8	78.8	89.4	78.8	71.2
56.5°	73.0	69.9	76.0	85.8	76.0	70.0
57°	70.5	68.4	73.2	82.4	73.3	68.8
57.5°	68.3	67.2	70.7	79.2	70.9	67.6
58°	66.4	66.0	68.6	76.3	68.9	66.4
58.5°	65.0	64.8	66.9	73.5	67.3	65.2
59°	63.9	63.7	65.7	71.0	66.2	64.0
59.5°	62.7	62.6	64.4	68.5	64.9	62.7
60°	61.6	61.4	63.3	66.4	63.8	61.5
60.5°	60.4	60.3	62.1	64.4	62.4	60.1
61°	59.2	59.2	60.8	62.5	61.3	58.9
61.5°	58.0	58.0	59.7	60.7	60.0	57.7
62°	56.8	56.8	58.5	59.0	58.7	56.4
62.5°	55.7	55.7	57.3	57.5	57.4	55.1
63°	54.5	54.6	56.1	56.0	56.1	53.9
63.5°	53.4	53.5	55.0	54.6	54.8	52.6
64°	52.2	52.4	53.8	53.3	53.6	51.4
64.5°	51.1	51.3	52.5	52.1	52.3	50.1
65°	50.0	50.1	51.5	51.0	51.1	49.0
65.5°	48.9	49.1	50.3	49.7	49.8	47.7
66°	47.7	47.9	49.1	48.5	48.5	46.4



TEST NUMBER: P775713

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-4000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
67.5°	44.3	44.7	45.7	45.1	44.8	42.8
68°	43.2	43.6	44.5	43.8	43.5	41.6
68.5°	42.1	42.4	43.4	42.6	42.2	40.3
69°	41.0	41.4	42.2	41.4	41.1	39.2
69.5°	39.8	40.3	41.1	40.1	39.8	37.7
70°	38.8	39.3	39.9	39.0	38.6	36.6
70.5°	37.6	38.0	38.9	37.9	37.4	35.5
71°	36.6	37.0	38.1	36.8	36.1	34.4
71.5°	35.4	36.0	37.0	35.5	35.0	33.3
72°	34.4	35.0	35.7	34.4	33.8	32.0
72.5°	33.2	33.9	34.6	33.2	32.6	30.9
73°	32.2	33.0	33.4	32.0	31.3	29.6
73.5°	31.1	31.8	32.3	30.8	30.2	28.5
74°	29.9	30.8	31.2	29.6	28.9	27.2
74.5°	28.9	29.7	30.1	28.5	27.6	26.1
75°	27.7	28.7	28.9	27.3	26.5	24.9
75.5°	26.7	27.6	27.8	26.2	25.2	23.7
76°	25.5	26.6	26.7	24.9	24.1	22.5
76.5°	24.5	25.4	25.6	23.7	22.8	21.3
77°	23.4	24.4	24.5	22.7	21.5	20.2
77.5°	22.3	23.3	23.4	21.5	20.4	19.0
78°	21.2	22.3	22.3	20.4	19.1	17.9
78.5°	20.1	21.2	21.2	19.2	18.0	16.7
79°	19.0	20.2	20.1	18.2	16.7	15.6
79.5°	18.0	19.1	19.0	17.0	15.6	14.4
80°	16.8	18.1	17.9	16.0	14.3	13.2
80.5°	15.8	17.0	16.8	14.9	13.1	12.2
81°	14.7	16.1	15.8	13.9	12.0	11.0
81.5°	13.8	15.0	14.7	12.8	10.9	9.9
82°	12.7	14.0	13.7	11.8	9.8	8.7
82.5°	11.7	13.0	12.6	10.8	8.8	7.7
83°	10.7	12.0	11.6	9.9	7.8	6.5
83.5°	9.7	10.9	10.5	8.9	6.8	5.4
84°	8.7	10.0	9.5	8.0	5.9	4.3
84.5°	7.7	9.0	8.5	7.1	5.0	3.8
85°	6.7	8.0	7.5	6.2	4.3	3.3
85.5°	5.7	7.0	6.4	5.4	3.7	2.6
86°	4.7	6.0	5.4	4.4	3.0	2.1
86.5°	3.7	5.0	4.4	3.6	2.4	1.6
87°	2.7	4.0	3.5	2.7	1.8	1.2
87.5°	1.8	3.2	2.6	2.0	1.2	0.6
88°	0.9	2.2	1.8	1.2	0.5	0.2
88.5°	0.3	1.3	0.9	0.3	0.2	0.0



TEST NUMBER: P775713  
CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-4000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
90°	0.0	0.0	0.0	0.1	0.1	0.0



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— 0°-180°    - - 45°-225°    - - - - 90°-270°    - · - · 135°-315°

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21.5°	574.4	578.6	589.2	598.3	597.7	601.2	603.3	602.4	600.2	596.6	587.9
22°	570.4	574.8	585.7	594.9	594.6	598.0	600.1	599.2	597.0	593.4	584.2



44°	182.1	208.7	270.7	258.7	217.5	251.9	301.8	256.9	225.9	254.6	272.8
44.5°	173.8	200.3	259.9	249.3	208.1	242.5	290.8	247.7	216.4	245.8	262.0



66.5°	45.3	46.4	47.2	48.1	45.0	46.7	46.9	46.7	45.2	47.5	47.0
67°	44.0	45.2	46.0	47.0	43.9	45.5	45.7	45.5	44.0	46.2	45.8



89°	0.0	0.1	0.1	0.5	0.1	0.2	0.4	0.5	0.5	0.7	0.4
89.5°	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.3	0.1



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21.5°	576.7	576.8	574.3	573.9	573.4	574.4
22°	572.9	572.9	570.4	570.0	569.5	570.4



44°	212.2	193.0	217.3	251.0	212.5	182.1
44.5°	203.7	184.6	208.7	241.2	204.0	173.8

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66.5°	46.5	46.9	48.0	47.4	47.3	45.3
67°	45.5	45.8	46.9	46.2	46.0	44.0

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89°	0.1	0.4	0.2	0.1	0.1	0.0
89.5°	0.0	0.1	0.1	0.1	0.1	0.0

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(END OF REPORT)