

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: P775711

Luminaire Tested: HCDJBL510CSD-HCD4TSQMW-1000lm-3000K

Issue Date: 2/7/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P775711  
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-3000K  
Description: 4 INCH SQUARE MEDIUM MATTE WHITE TRIM  
Light Source: SELECTABLE LUMENS AND CCT ARRAY 90CRI / 3000K CCT  
Ballast/Driver: -

**Summary**

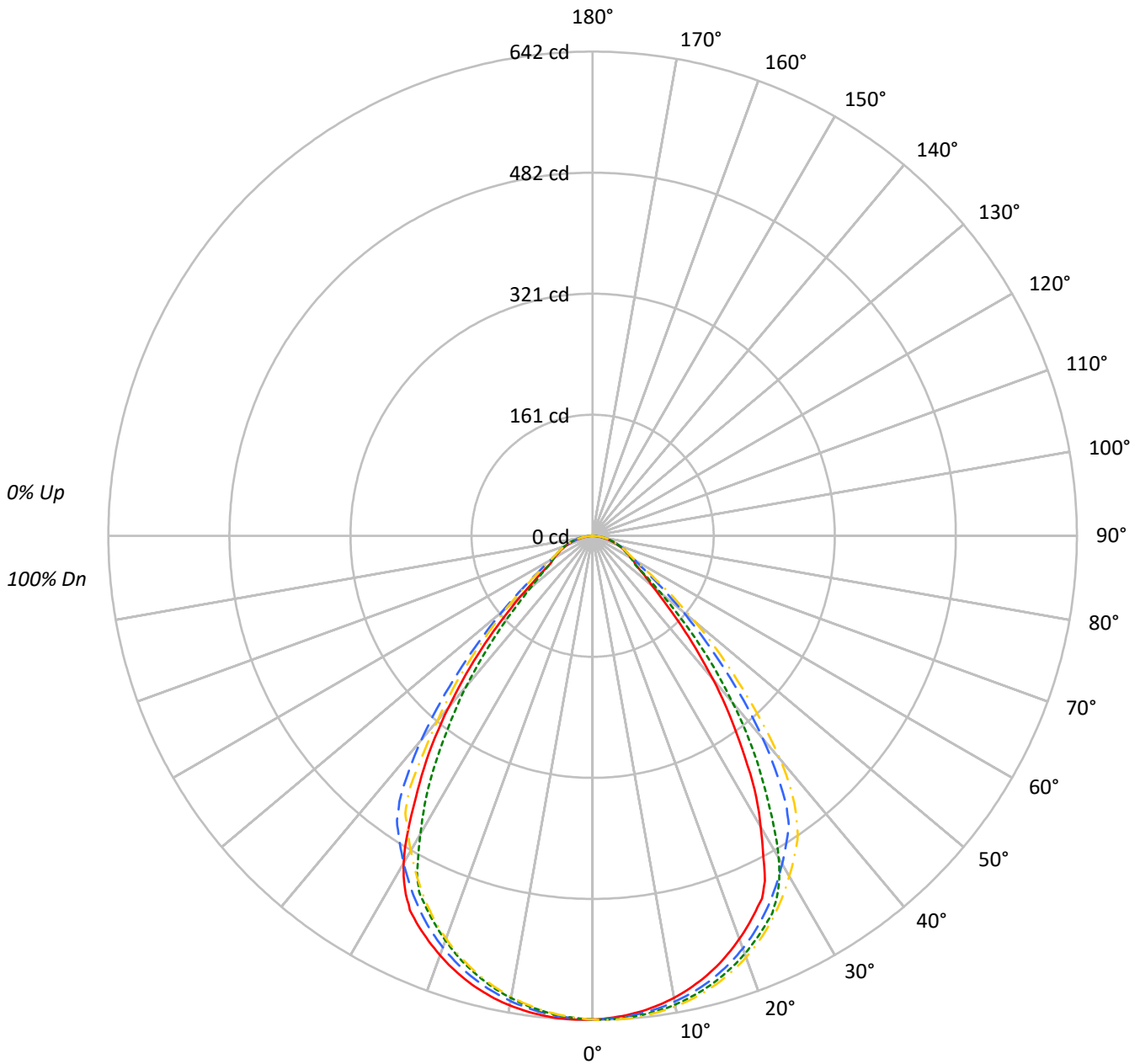
Lumens per Lamp: N/A  
Luminaire Lumens: 1060.5 lumens  
Efficiency: N/A  
Efficacy: 106.0 lumens/watt  
Spacing Criteria (0/90/45): 1.12 / 1.13 / 1.17  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

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: P775711  
CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-3000K

### Luminous Intensity Polar Plot





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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

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

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

	0°	90°	180°	270°
0°	63387	63387	63387	63387
5°	63044	63481	63540	63074
10°	62428	63352	63462	62488
15°	61397	62891	63076	61510
20°	59830	62028	62259	60050
25°	57911	60845	61019	58151
30°	50858	56313	57146	52113
35°	41726	47192	48217	43318
40°	31999	37212	38335	33586
45°	22505	27006	28097	23959
50°	15915	18083	19006	16484
55°	12597	12442	13166	12856
60°	11802	11446	11644	11782
65°	11133	10969	11063	11390
70°	10259	10519	10404	11040
75°	9242	9968	9586	10655
80°	7343	9221	8310	10018
85°	3629	7485	4990	8846

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 135°  
 Vertical Angle: 45°  
 Luminance: 37993 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	60.5	5.7
10°-20°	171.3	16.2
20°-30°	249.7	23.5
30°-40°	251.1	23.7
40°-50°	164.6	15.5
50°-60°	79.8	7.5
60°-70°	48.5	4.6
70°-80°	27.9	2.6
80°-90°	7.0	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°	481.5	45.4
0°-40°	732.6	69.1
0°-60°	977.1	92.1
0°-90°	1060.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1060.5	100.0

**CANDELA DISTRIBUTION:**

	0°	90°	180°	270°	360°	Flux
0°	641	641	641	641	641	
5°	635	640	640	636	635	60
15°	600	615	616	601	600	169
25°	531	558	560	533	531	239
35°	346	391	400	359	346	216
45°	161	193	201	171	161	127
55°	73	72	76	75	73	68
65°	48	47	47	49	48	47
75°	24	26	25	28	24	26
85°	3	7	4	8	3	5
90°	0	0	0	0	0	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	641.3	641.3	641.3	641.3	641.3	641.3	641.3	641.3	641.3	641.3	641.3
0.5°	641.2	641.0	641.1	641.1	641.5	641.6	641.8	641.9	641.7	641.3	641.0
1°	640.8	640.6	641.0	641.2	641.6	641.8	642.0	642.1	641.8	641.3	640.8
1.5°	640.3	640.3	640.8	641.2	641.6	641.9	642.2	642.2	641.9	641.3	640.6
2°	639.8	639.9	640.6	641.2	641.6	641.9	642.2	642.2	641.9	641.2	640.3
2.5°	639.3	639.5	640.3	641.0	641.5	641.9	642.2	642.2	641.9	641.1	640.0
3°	638.6	638.9	639.9	640.7	641.2	641.8	642.1	642.2	641.7	640.8	639.6
3.5°	638.0	638.3	639.5	640.5	641.0	641.6	642.0	642.0	641.5	640.5	639.1
4°	637.3	637.7	639.0	640.2	640.6	641.4	641.8	641.9	641.3	640.1	638.7
4.5°	636.4	636.9	638.4	639.8	640.3	641.0	641.6	641.6	641.0	639.7	638.1
5°	635.4	636.1	637.7	639.3	639.8	640.6	641.2	641.2	640.4	639.2	637.3
5.5°	634.5	635.1	637.0	638.8	639.3	640.1	640.7	640.7	640.0	638.7	636.6
6°	633.5	634.2	636.3	638.2	638.7	639.5	640.2	640.2	639.4	638.0	635.7
6.5°	632.4	633.2	635.4	637.6	638.0	639.0	639.6	639.6	638.7	637.3	634.8
7°	631.1	632.0	634.5	636.9	637.2	638.3	639.0	639.0	638.1	636.6	633.8
7.5°	629.7	630.7	633.5	636.1	636.4	637.6	638.3	638.2	637.3	635.6	632.8
8°	628.4	629.5	632.3	635.1	635.4	636.8	637.5	637.4	636.5	634.7	631.7
8.5°	626.9	628.0	631.3	634.2	634.5	635.8	636.6	636.6	635.5	633.7	630.4
9°	625.3	626.6	630.0	633.2	633.5	634.9	635.6	635.6	634.5	632.7	629.2
9.5°	623.7	625.0	628.7	632.0	632.4	633.9	634.6	634.5	633.4	631.5	627.9
10°	622.0	623.5	627.3	630.8	631.2	632.7	633.6	633.5	632.3	630.2	626.5
10.5°	620.1	621.8	625.8	629.5	629.8	631.5	632.4	632.3	631.1	629.0	624.9
11°	618.3	619.9	624.3	628.2	628.5	630.1	631.2	631.1	629.8	627.6	623.3
11.5°	616.4	618.1	622.7	626.8	627.0	628.8	629.8	629.6	628.4	626.2	621.7
12°	614.2	616.1	620.9	625.2	625.4	627.5	628.5	628.2	626.9	624.6	619.9
12.5°	612.1	614.1	619.1	623.6	623.8	625.9	627.0	626.7	625.3	623.0	618.1
13°	609.8	612.1	617.3	622.1	622.2	624.2	625.4	625.1	623.7	621.4	616.3
13.5°	607.6	609.8	615.4	620.2	620.4	622.7	623.8	623.4	622.0	619.5	614.2
14°	605.2	607.5	613.3	618.5	618.6	620.8	622.1	621.7	620.1	617.6	612.2
14.5°	602.7	605.0	611.3	616.6	616.7	618.9	620.2	619.9	618.3	615.6	610.0
15°	600.0	602.6	609.0	614.6	614.6	617.1	618.4	617.9	616.4	613.7	607.8
15.5°	597.3	600.0	606.8	612.6	612.6	615.1	616.5	615.9	614.2	611.6	605.4
16°	594.5	597.4	604.3	610.4	610.3	612.9	614.4	613.8	612.1	609.4	603.1
16.5°	591.6	594.6	601.9	608.1	608.0	610.7	612.3	611.7	609.8	607.1	600.5
17°	588.6	591.8	599.4	605.8	605.6	608.4	610.0	609.5	607.6	604.7	598.0
17.5°	585.4	588.8	596.8	603.5	603.2	606.1	607.7	607.2	605.0	602.3	595.3
18°	582.4	585.8	594.0	600.9	600.6	603.7	605.2	604.6	602.5	599.7	592.6
18.5°	579.0	582.6	591.2	598.4	598.1	601.0	602.8	602.1	600.0	597.2	589.7
19°	575.7	579.4	588.3	595.8	595.3	598.3	600.2	599.4	597.4	594.4	586.9
19.5°	572.3	576.0	585.3	593.0	592.6	595.8	597.6	596.7	594.7	591.6	583.9
20°	568.8	572.8	582.3	590.1	589.7	592.9	594.7	594.0	591.9	588.7	580.7
20.5°	565.3	569.3	579.0	587.2	586.8	590.0	592.0	591.0	588.9	585.7	577.5
21°	561.8	565.7	575.7	584.2	583.7	587.1	589.0	588.1	585.9	582.8	574.3



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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°	550.3	554.7	565.4	574.6	574.4	577.8	579.6	578.9	576.7	573.2	564.0
23°	546.4	550.9	561.6	571.4	571.0	574.5	576.3	575.6	573.4	569.8	560.3
23.5°	542.6	547.0	557.9	568.1	567.7	571.2	573.0	572.3	570.2	566.3	556.5
24°	538.4	543.0	554.1	564.6	564.3	567.9	569.5	568.9	566.9	562.9	552.8
24.5°	534.8	539.1	550.2	561.1	560.8	564.4	565.8	565.4	563.3	559.4	548.9
25°	531.0	535.0	546.1	557.5	557.9	560.9	562.2	561.9	559.5	555.8	544.8
25.5°	524.9	530.9	542.1	553.8	553.8	557.4	558.5	558.4	556.0	552.2	540.8
26°	518.2	526.9	537.9	550.1	548.3	553.6	554.6	554.7	552.6	548.4	536.5
26.5°	511.8	523.2	533.7	546.3	543.6	550.0	550.7	550.8	546.3	544.5	532.4
27°	502.4	518.4	529.4	542.4	538.2	546.6	546.7	547.0	541.5	540.4	528.1
27.5°	492.3	511.0	525.0	538.9	532.1	542.0	542.8	543.4	536.2	536.7	523.7
28°	482.4	505.1	520.5	535.0	525.2	536.3	538.5	538.3	530.1	532.2	519.2
28.5°	472.9	497.0	516.0	529.2	518.2	531.6	534.4	532.4	523.6	526.1	514.8
29°	463.6	487.4	511.5	524.0	510.5	525.8	530.2	527.7	516.4	521.1	510.1
29.5°	454.6	477.8	507.0	518.8	502.4	519.5	525.9	521.9	508.9	515.6	505.6
30°	445.6	468.1	502.4	512.8	493.4	512.9	521.5	515.5	500.7	509.4	500.9
30.5°	436.8	458.6	497.8	506.2	483.8	505.8	517.3	508.9	492.0	502.7	496.2
31°	428.0	449.3	493.1	499.1	473.9	498.1	512.9	501.8	482.7	495.7	491.5
31.5°	419.1	440.5	488.3	491.8	463.5	490.3	508.4	494.2	472.4	488.2	486.8
32°	409.3	431.6	483.7	484.0	453.0	481.7	503.8	486.0	461.9	480.3	482.0
32.5°	399.8	423.0	478.8	475.7	442.2	472.3	499.3	477.5	451.4	471.6	477.1
33°	389.5	414.2	474.3	466.5	431.6	462.6	494.6	468.3	440.9	462.6	472.3
33.5°	378.7	405.3	469.9	457.5	421.2	452.5	490.2	458.6	430.1	453.0	467.5
34°	367.3	395.8	465.4	447.7	411.0	442.2	485.8	448.5	419.5	443.1	463.4
34.5°	356.7	386.2	458.3	437.4	401.0	431.9	480.1	438.1	409.4	432.8	458.0
35°	345.8	376.2	450.2	427.1	391.1	421.6	472.8	427.4	399.6	422.2	449.9
35.5°	335.5	365.7	443.3	416.9	381.3	411.4	466.3	417.4	390.0	412.0	442.5
36°	325.3	354.9	434.5	406.8	371.5	401.5	459.9	407.2	380.1	402.0	435.8
36.5°	315.7	344.2	424.5	396.8	361.5	391.6	452.1	397.2	370.0	392.0	426.8
37°	306.0	333.6	414.3	386.7	351.3	381.8	444.2	387.3	360.4	382.2	416.7
37.5°	296.6	323.9	403.7	377.1	340.9	372.4	435.7	377.8	350.1	372.8	406.5
38°	287.2	313.7	393.2	367.5	330.3	362.5	426.7	368.1	339.6	363.2	396.1
38.5°	277.7	304.3	382.7	358.0	319.8	352.9	417.6	358.9	328.7	354.0	385.3
39°	267.9	295.1	372.4	348.5	309.5	343.2	407.6	349.0	318.1	344.5	374.8
39.5°	258.0	286.0	362.0	338.8	298.9	333.1	397.3	339.2	307.7	335.0	363.9
40°	248.0	276.4	351.2	329.4	288.4	323.1	386.5	328.9	297.1	325.2	352.9
40.5°	238.2	267.4	340.4	319.6	278.3	312.9	375.4	318.8	286.9	315.1	341.7
41°	228.6	258.0	329.4	309.6	268.7	302.6	363.6	308.4	276.8	305.0	330.7
41.5°	219.4	248.7	318.5	299.7	258.8	292.7	351.7	298.2	267.3	295.0	319.7
42°	210.2	239.2	307.4	289.7	249.2	282.9	339.7	288.1	257.5	285.1	308.5
42.5°	201.7	229.9	296.3	279.9	239.6	273.1	327.7	278.0	248.0	275.5	297.6
43°	193.2	220.7	285.1	270.2	230.0	263.4	316.2	268.4	238.7	265.9	287.0
43.5°	184.9	211.7	273.9	260.9	220.7	254.0	304.7	258.9	229.1	256.7	275.7



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
45°	161.0	186.4	242.2	233.4	193.2	226.6	271.8	231.2	201.0	229.7	244.6
45.5°	153.5	178.4	232.1	224.6	184.2	217.2	261.7	222.3	192.1	221.3	234.5
46°	146.4	170.5	222.6	215.9	175.6	208.4	251.8	213.1	183.2	212.3	224.9
46.5°	139.5	162.9	213.4	207.2	167.2	199.8	241.7	204.1	174.7	203.5	215.5
47°	132.9	155.4	204.5	198.6	159.2	191.1	232.1	195.1	166.6	194.9	206.5
47.5°	127.0	148.2	195.9	190.1	151.5	182.7	222.5	186.4	158.7	186.6	197.6
48°	121.5	141.3	187.2	181.8	144.0	174.4	212.8	178.1	151.1	178.3	188.8
48.5°	116.5	134.5	178.8	173.4	137.1	166.2	203.7	169.9	143.9	170.3	180.3
49°	111.9	128.2	170.9	165.5	130.2	158.4	194.2	162.1	136.8	162.6	172.2
49.5°	107.5	122.4	163.1	158.0	123.8	150.5	185.1	154.1	130.1	155.2	164.3
50°	103.5	116.8	155.4	150.6	117.6	143.3	176.5	146.9	123.6	147.9	156.8
50.5°	99.9	111.7	148.0	143.5	111.6	136.0	167.9	139.5	117.4	140.9	149.2
51°	96.6	107.1	140.9	136.9	105.9	129.3	159.8	132.7	111.6	134.2	142.3
51.5°	93.3	102.8	134.2	130.1	100.8	122.9	152.0	126.1	106.1	127.9	135.5
52°	90.2	99.0	127.8	123.9	95.9	116.8	144.5	120.0	101.0	121.8	129.1
52.5°	87.2	95.3	121.9	117.7	91.9	110.7	137.1	113.7	96.1	115.6	123.0
53°	84.3	92.0	116.0	111.8	87.8	105.1	130.3	107.9	91.8	110.1	117.1
53.5°	81.2	88.8	110.6	105.9	83.7	99.7	123.6	102.6	87.9	104.6	111.6
54°	78.4	85.8	105.3	100.6	79.6	94.7	117.4	97.5	84.1	99.4	106.2
54.5°	75.6	82.9	100.5	95.5	75.6	90.6	111.2	92.6	80.2	94.5	101.4
55°	73.1	80.0	95.9	90.7	72.2	86.4	105.7	88.5	76.4	90.5	96.9
55.5°	70.8	77.2	91.7	86.4	69.4	82.4	100.1	84.5	73.0	86.5	92.4
56°	69.2	74.4	87.6	82.3	67.3	78.2	94.9	80.5	70.0	82.6	88.7
56.5°	68.0	71.6	83.8	78.5	65.9	74.1	90.7	76.5	67.6	78.7	84.9
57°	66.9	69.3	80.3	74.9	64.7	70.6	86.4	73.0	65.9	74.7	81.1
57.5°	65.6	67.2	77.0	71.5	63.6	67.6	82.3	69.7	64.7	71.3	77.5
58°	64.5	65.7	74.0	68.4	62.5	65.1	78.1	67.0	63.6	68.3	74.5
58.5°	63.4	64.5	71.3	65.8	61.3	63.6	73.8	64.6	62.5	65.8	71.6
59°	62.2	63.3	68.8	64.2	60.1	62.3	70.6	63.1	61.2	63.9	69.0
59.5°	60.9	62.2	66.5	62.9	59.0	61.1	67.8	61.7	60.1	62.6	66.6
60°	59.7	61.0	64.4	61.6	57.9	60.0	65.2	60.6	58.9	61.3	64.4
60.5°	58.4	59.8	62.5	60.5	56.7	58.8	63.0	59.4	57.8	60.2	62.4
61°	57.3	58.6	60.6	59.3	55.6	57.7	61.0	58.3	56.5	59.1	60.5
61.5°	56.0	57.4	58.9	58.1	54.5	56.5	59.1	57.2	55.3	57.9	58.8
62°	54.8	56.1	57.4	57.0	53.5	55.4	57.4	55.9	54.2	56.7	57.2
62.5°	53.5	54.8	55.7	55.8	52.4	54.3	55.7	54.7	53.1	55.5	55.5
63°	52.4	53.6	54.3	54.7	51.2	53.1	54.2	53.6	51.8	54.3	54.1
63.5°	51.1	52.4	52.9	53.5	50.1	51.9	52.8	52.4	50.7	53.2	52.8
64°	49.9	51.1	51.6	52.4	49.1	50.8	51.3	51.1	49.6	51.9	51.4
64.5°	48.7	50.0	50.4	51.2	48.0	49.7	50.1	50.0	48.4	50.7	50.2
65°	47.6	48.7	49.3	50.1	46.9	48.7	49.0	48.8	47.3	49.6	49.0
65.5°	46.3	47.5	48.2	49.0	45.8	47.6	47.8	47.7	46.1	48.4	47.9
66°	45.1	46.3	46.9	47.9	44.8	46.4	46.6	46.4	45.0	47.3	46.7





TEST NUMBER: P775711

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
67.5°	41.5	42.7	43.5	44.5	41.6	43.2	43.3	43.0	41.6	43.8	43.4
68°	40.4	41.4	42.4	43.4	40.6	42.0	42.0	41.8	40.5	42.7	42.3
68.5°	39.2	40.2	41.1	42.3	39.5	41.0	40.9	40.7	39.4	41.4	41.1
69°	38.1	39.1	40.0	41.1	38.5	39.9	39.8	39.6	38.3	40.3	39.9
69.5°	36.6	37.9	38.8	40.1	37.5	38.8	38.7	38.4	37.2	39.2	38.8
70°	35.5	37.0	37.7	39.0	36.4	37.8	37.5	37.3	36.0	38.1	37.7
70.5°	34.5	35.8	36.4	37.9	35.4	36.7	36.3	36.1	35.0	36.9	36.5
71°	33.4	34.6	35.3	36.9	34.4	35.6	35.2	35.0	33.9	35.8	35.4
71.5°	32.4	33.3	34.2	35.8	33.4	34.5	34.1	33.9	32.8	34.6	34.3
72°	31.1	32.0	33.1	34.8	32.4	33.5	33.0	32.8	31.6	33.5	33.2
72.5°	30.0	30.8	31.9	33.7	31.3	32.5	31.8	31.6	30.6	32.4	32.0
73°	28.8	29.7	30.8	32.7	30.2	31.4	30.7	30.5	29.5	31.2	30.9
73.5°	27.7	28.5	29.7	31.5	29.2	30.3	29.7	29.4	28.4	30.1	29.8
74°	26.4	27.4	28.6	30.5	28.3	29.3	28.6	28.3	27.4	29.0	28.7
74.5°	25.3	26.1	27.4	29.4	27.3	28.3	27.5	27.1	26.2	27.9	27.7
75°	24.2	24.9	26.2	28.4	26.1	27.1	26.4	26.0	25.1	26.7	26.5
75.5°	23.1	23.8	25.1	27.3	25.1	26.1	25.3	24.9	24.1	25.6	25.4
76°	21.8	22.6	24.0	26.2	24.1	25.1	24.2	23.8	23.0	24.5	24.3
76.5°	20.7	21.4	22.9	25.2	23.2	24.1	23.2	22.7	21.9	23.5	23.2
77°	19.6	20.2	21.7	24.1	22.1	23.1	22.1	21.5	20.8	22.4	22.0
77.5°	18.5	19.1	20.6	23.1	21.1	22.0	21.1	20.4	19.8	21.2	21.0
78°	17.4	17.9	19.6	21.9	20.1	20.9	20.0	19.3	18.8	20.1	19.9
78.5°	16.2	16.7	18.5	20.9	19.1	19.9	19.0	18.2	17.7	19.0	18.8
79°	15.1	15.5	17.5	19.8	18.2	18.9	18.0	17.0	16.6	17.9	17.8
79.5°	14.0	14.4	16.3	18.8	17.1	17.9	16.9	15.9	15.6	16.8	16.7
80°	12.9	13.3	15.3	17.8	16.2	16.8	15.9	14.9	14.6	15.7	15.7
80.5°	11.8	12.1	14.3	16.6	15.2	15.8	15.0	13.8	13.6	14.6	14.6
81°	10.7	10.9	13.3	15.6	14.3	14.8	14.0	12.8	12.6	13.5	13.7
81.5°	9.6	9.8	12.2	14.6	13.3	13.9	13.1	11.8	11.5	12.5	12.7
82°	8.5	8.8	11.2	13.6	12.3	12.9	12.0	10.8	10.4	11.3	11.6
82.5°	7.5	7.8	10.3	12.7	11.4	11.9	11.1	9.9	9.4	10.2	10.7
83°	6.3	6.8	9.4	11.6	10.5	10.9	10.2	9.0	8.5	9.3	9.8
83.5°	5.2	5.8	8.5	10.7	9.5	10.0	9.4	8.1	7.5	8.3	9.0
84°	4.2	5.0	7.6	9.7	8.6	9.0	8.5	7.1	6.4	7.2	8.2
84.5°	3.7	4.2	6.7	8.8	7.7	8.1	7.7	6.3	5.4	6.3	7.3
85°	3.2	3.6	5.9	7.8	6.6	7.1	6.7	5.4	4.4	5.3	6.5
85.5°	2.6	3.0	5.0	6.8	5.7	6.1	5.9	4.6	3.7	4.5	5.6
86°	2.0	2.4	4.2	5.8	4.8	5.2	5.1	4.0	3.1	3.9	4.9
86.5°	1.5	1.9	3.5	4.9	3.9	4.3	4.3	3.4	2.7	3.4	4.1
87°	1.1	1.3	2.7	4.0	3.0	3.4	3.5	2.8	2.2	2.9	3.3
87.5°	0.6	0.8	1.9	3.1	2.0	2.4	2.7	2.1	1.7	2.2	2.4
88°	0.2	0.3	1.1	2.2	1.2	1.5	1.8	1.6	1.3	1.7	1.7
88.5°	0.0	0.1	0.4	1.3	0.4	0.7	1.0	1.0	0.9	1.2	0.9



TEST NUMBER: P775711  
CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-3000K

**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: P775711

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
0°	641.3	641.3	641.3	641.3	641.3	641.3
0.5°	640.5	641.1	641.1	641.2	641.3	641.2
1°	640.3	640.7	640.6	640.7	641.0	640.8
1.5°	639.9	640.3	640.1	640.2	640.4	640.3
2°	639.5	639.9	639.6	639.6	639.8	639.8
2.5°	639.0	639.4	639.0	639.0	639.2	639.3
3°	638.4	638.8	638.3	638.3	638.5	638.6
3.5°	637.7	638.2	637.7	637.6	637.8	638.0
4°	637.0	637.4	636.9	636.8	637.0	637.3
4.5°	636.2	636.7	635.9	635.8	636.1	636.4
5°	635.2	635.7	634.9	634.9	635.1	635.4
5.5°	634.3	634.8	633.9	633.8	634.1	634.5
6°	633.3	633.7	632.8	632.7	633.0	633.5
6.5°	632.2	632.6	631.7	631.6	631.8	632.4
7°	630.9	631.4	630.3	630.2	630.5	631.1
7.5°	629.6	630.1	629.0	628.9	629.1	629.7
8°	628.3	628.7	627.6	627.5	627.8	628.4
8.5°	626.9	627.3	626.0	625.9	626.3	626.9
9°	625.4	625.7	624.5	624.3	624.6	625.3
9.5°	623.8	624.1	622.9	622.7	623.0	623.7
10°	622.1	622.6	621.2	620.8	621.3	622.0
10.5°	620.3	620.8	619.3	619.1	619.3	620.1
11°	618.5	618.9	617.5	617.2	617.5	618.3
11.5°	616.7	617.0	615.4	615.1	615.5	616.4
12°	614.6	615.0	613.4	613.1	613.4	614.2
12.5°	612.6	612.9	611.3	610.9	611.1	612.1
13°	610.4	610.7	609.0	608.7	609.0	609.8
13.5°	608.1	608.5	606.8	606.5	606.7	607.6
14°	605.8	606.1	604.3	604.0	604.3	605.2
14.5°	603.4	603.7	601.9	601.5	601.7	602.7
15°	600.9	601.1	599.3	598.9	599.0	600.0
15.5°	598.3	598.5	596.6	596.2	596.2	597.3
16°	595.6	595.8	593.8	593.5	593.6	594.5
16.5°	592.8	593.1	591.0	590.6	590.7	591.6
17°	589.9	590.1	588.2	587.8	587.8	588.6
17.5°	587.0	587.2	585.1	584.7	584.6	585.4
18°	584.0	584.0	582.1	581.7	581.6	582.4
18.5°	580.7	580.8	578.8	578.6	578.3	579.0
19°	577.6	577.7	575.5	575.2	574.9	575.7
19.5°	574.3	574.3	572.2	572.0	571.5	572.3
20°	570.8	570.9	568.7	568.5	568.0	568.8
20.5°	567.4	567.5	565.2	564.8	564.4	565.3
21°	563.8	563.9	561.5	561.3	560.7	561.8



TEST NUMBER: P775711

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
22.5°	552.7	552.9	550.2	549.7	549.3	550.3
23°	548.8	549.0	546.3	545.8	545.4	546.4
23.5°	545.0	545.0	542.5	541.5	541.4	542.6
24°	541.0	541.1	538.4	537.5	537.4	538.4
24.5°	536.9	537.1	534.2	533.2	533.2	534.8
25°	532.8	533.2	530.1	528.9	528.9	531.0
25.5°	528.7	529.6	525.8	524.3	524.8	524.9
26°	524.6	524.8	521.5	520.1	520.4	518.2
26.5°	520.9	517.6	517.4	515.3	516.6	511.8
27°	516.7	511.9	513.6	510.9	512.6	502.4
27.5°	510.1	504.0	509.1	506.1	506.1	492.3
28°	503.5	494.4	502.4	501.4	499.5	482.4
28.5°	497.1	484.7	495.8	496.6	492.9	472.9
29°	488.4	475.2	489.5	491.9	483.8	463.6
29.5°	478.9	465.7	480.5	486.8	474.2	454.6
30°	469.4	456.6	471.3	482.1	464.3	445.6
30.5°	460.1	447.2	461.5	477.2	455.0	436.8
31°	451.0	438.3	452.4	472.3	445.7	428.0
31.5°	441.7	429.2	443.1	467.3	436.6	419.1
32°	432.7	420.0	434.2	462.3	427.9	409.3
32.5°	423.8	410.4	425.4	457.4	419.6	399.8
33°	414.9	400.7	416.5	452.7	410.9	389.5
33.5°	405.8	390.6	407.6	448.6	402.5	378.7
34°	396.3	380.2	398.9	444.0	393.7	367.3
34.5°	386.8	369.7	389.6	436.4	384.6	356.7
35°	377.1	359.0	380.1	427.4	374.8	345.8
35.5°	367.0	348.2	370.5	420.7	365.2	335.5
36°	356.8	338.0	360.4	411.0	354.8	325.3
36.5°	346.4	327.7	350.5	399.0	344.7	315.7
37°	336.2	318.0	340.3	386.9	334.0	306.0
37.5°	326.1	308.2	330.3	375.0	324.1	296.6
38°	316.3	298.6	320.2	363.1	314.4	287.2
38.5°	306.8	289.1	310.8	351.8	305.0	277.7
39°	297.1	279.9	301.2	340.8	295.8	267.9
39.5°	287.8	270.1	292.3	330.2	286.8	258.0
40°	278.7	260.3	283.1	320.0	278.0	248.0
40.5°	269.9	250.8	274.0	310.2	269.2	238.2
41°	260.5	241.1	265.1	300.6	260.4	228.6
41.5°	251.3	231.6	256.2	291.0	251.2	219.4
42°	242.0	222.3	247.0	281.6	242.1	210.2
42.5°	233.0	213.3	237.8	272.5	233.1	201.7
43°	223.8	204.4	228.8	263.1	224.0	193.2
43.5°	214.7	195.9	219.7	253.5	215.1	184.9

TEST NUMBER: P775711

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
45°	189.4	171.4	194.1	224.8	190.0	161.0
45.5°	181.7	163.6	186.3	215.8	182.3	153.5
46°	173.6	156.0	178.4	207.0	174.5	146.4
46.5°	166.0	148.5	170.5	198.3	167.0	139.5
47°	158.5	141.5	163.1	190.1	159.6	132.9
47.5°	151.3	134.5	155.4	182.4	152.5	127.0
48°	144.0	128.4	148.2	175.0	145.4	121.5
48.5°	137.3	122.3	141.4	168.0	138.7	116.5
49°	130.5	116.9	134.7	161.0	132.3	111.9
49.5°	124.4	111.9	128.4	154.3	126.3	107.5
50°	118.3	107.2	122.4	147.8	120.6	103.5
50.5°	112.9	102.9	116.9	141.5	115.3	99.9
51°	107.8	99.1	111.6	135.3	110.5	96.6
51.5°	103.1	95.5	107.0	129.3	106.0	93.3
52°	98.8	92.3	102.8	123.6	102.0	90.2
52.5°	94.9	89.1	98.7	118.1	98.2	87.2
53°	91.3	86.0	95.0	112.9	94.6	84.3
53.5°	88.3	83.1	91.5	107.9	91.2	81.2
54°	85.3	80.1	88.2	103.2	88.1	78.4
54.5°	82.4	77.4	85.3	98.7	85.0	75.6
55°	79.3	74.6	82.3	94.5	82.3	73.1
55.5°	76.3	72.0	79.3	90.5	79.3	70.8
56°	73.7	69.7	76.5	86.9	76.5	69.2
56.5°	70.9	67.9	73.8	83.4	73.8	68.0
57°	68.5	66.4	71.1	80.0	71.2	66.9
57.5°	66.3	65.3	68.7	77.0	68.9	65.6
58°	64.5	64.1	66.6	74.1	67.0	64.5
58.5°	63.2	63.0	65.0	71.4	65.4	63.4
59°	62.1	61.8	63.8	69.0	64.3	62.2
59.5°	60.9	60.8	62.6	66.5	63.1	60.9
60°	59.8	59.6	61.4	64.5	62.0	59.7
60.5°	58.7	58.6	60.3	62.6	60.6	58.4
61°	57.5	57.5	59.1	60.7	59.5	57.3
61.5°	56.3	56.3	58.0	59.0	58.3	56.0
62°	55.2	55.2	56.8	57.4	57.1	54.8
62.5°	54.1	54.1	55.6	55.8	55.7	53.5
63°	53.0	53.1	54.5	54.4	54.5	52.4
63.5°	51.8	51.9	53.4	53.1	53.3	51.1
64°	50.7	50.9	52.3	51.7	52.1	49.9
64.5°	49.6	49.8	51.0	50.6	50.8	48.7
65°	48.6	48.7	50.0	49.5	49.6	47.6
65.5°	47.5	47.7	48.9	48.3	48.4	46.3
66°	46.3	46.5	47.7	47.2	47.2	45.1



TEST NUMBER: P775711

CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
67.5°	43.1	43.4	44.4	43.8	43.5	41.5
68°	41.9	42.4	43.3	42.6	42.3	40.4
68.5°	40.9	41.2	42.2	41.3	41.0	39.2
69°	39.8	40.2	41.0	40.2	39.9	38.1
69.5°	38.7	39.2	39.9	39.0	38.7	36.6
70°	37.7	38.2	38.8	37.9	37.5	35.5
70.5°	36.5	36.9	37.8	36.8	36.3	34.5
71°	35.5	35.9	37.0	35.7	35.1	33.4
71.5°	34.4	35.0	35.9	34.5	34.0	32.4
72°	33.4	34.0	34.7	33.4	32.9	31.1
72.5°	32.3	33.0	33.6	32.3	31.6	30.0
73°	31.2	32.0	32.5	31.1	30.4	28.8
73.5°	30.2	30.9	31.3	29.9	29.3	27.7
74°	29.1	29.9	30.3	28.8	28.1	26.4
74.5°	28.1	28.9	29.2	27.7	26.8	25.3
75°	26.9	27.9	28.1	26.5	25.7	24.2
75.5°	25.9	26.8	27.0	25.4	24.5	23.1
76°	24.8	25.8	25.9	24.2	23.4	21.8
76.5°	23.8	24.7	24.9	23.1	22.1	20.7
77°	22.8	23.7	23.8	22.0	20.9	19.6
77.5°	21.6	22.7	22.8	20.9	19.8	18.5
78°	20.6	21.6	21.6	19.8	18.6	17.4
78.5°	19.5	20.6	20.6	18.7	17.5	16.2
79°	18.5	19.6	19.5	17.7	16.2	15.1
79.5°	17.5	18.6	18.5	16.5	15.1	14.0
80°	16.3	17.6	17.4	15.5	13.9	12.9
80.5°	15.3	16.5	16.3	14.5	12.8	11.8
81°	14.3	15.6	15.3	13.5	11.6	10.7
81.5°	13.4	14.6	14.3	12.5	10.6	9.6
82°	12.3	13.6	13.3	11.4	9.5	8.5
82.5°	11.3	12.7	12.2	10.5	8.6	7.5
83°	10.4	11.6	11.2	9.6	7.6	6.3
83.5°	9.4	10.6	10.2	8.7	6.6	5.2
84°	8.5	9.7	9.2	7.8	5.7	4.2
84.5°	7.5	8.8	8.3	6.9	4.9	3.7
85°	6.5	7.8	7.2	6.0	4.2	3.2
85.5°	5.5	6.8	6.2	5.2	3.6	2.6
86°	4.6	5.8	5.2	4.3	3.0	2.0
86.5°	3.6	4.9	4.3	3.5	2.3	1.5
87°	2.7	3.9	3.4	2.7	1.7	1.1
87.5°	1.7	3.1	2.6	1.9	1.1	0.6
88°	0.9	2.1	1.7	1.1	0.5	0.2
88.5°	0.3	1.2	0.9	0.3	0.2	0.0



TEST NUMBER: P775711  
CATALOG NUMBER: HCDJBL510CSD-HCD4TSQMW-1000lm-3000K

**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°	558.0	562.1	572.4	581.1	580.6	584.0	586.0	585.1	583.0	579.5	571.0
22°	554.1	558.4	568.9	577.9	577.6	580.8	582.9	582.1	579.9	576.4	567.5



44°	176.9	202.7	262.9	251.3	211.3	244.6	293.1	249.5	219.4	247.3	265.0
44.5°	168.8	194.5	252.5	242.2	202.2	235.6	282.5	240.6	210.2	238.7	254.5



66.5°	44.0	45.1	45.8	46.7	43.7	45.3	45.5	45.3	43.9	46.1	45.6
67°	42.8	43.9	44.7	45.6	42.7	44.2	44.4	44.2	42.8	44.9	44.5



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°	560.2	560.3	557.9	557.5	557.0	558.0
22°	556.5	556.5	554.1	553.7	553.2	554.1



44°	206.2	187.5	211.1	243.8	206.4	176.9
44.5°	197.9	179.3	202.7	234.3	198.2	168.8



66.5°	45.2	45.5	46.6	46.0	45.9	44.0
67°	44.2	44.5	45.5	44.9	44.7	42.8

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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)