

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: P775688

Luminaire Tested: HCDJBL510CSD-HCD4TRMW-1000lm-4000K

Issue Date: 2/7/2024

Test Information

Test Method: LM-79-2019
Report Number: P775688
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-HCD4TRMW-1000lm-4000K
Description: 4 INCH ROUND MEDIUM MATTE WHITE TRIM
Light Source: SELECTABLE LUMENS AND CCT ARRAY 90CRI / 4000K CCT
Ballast/Driver: -

Summary

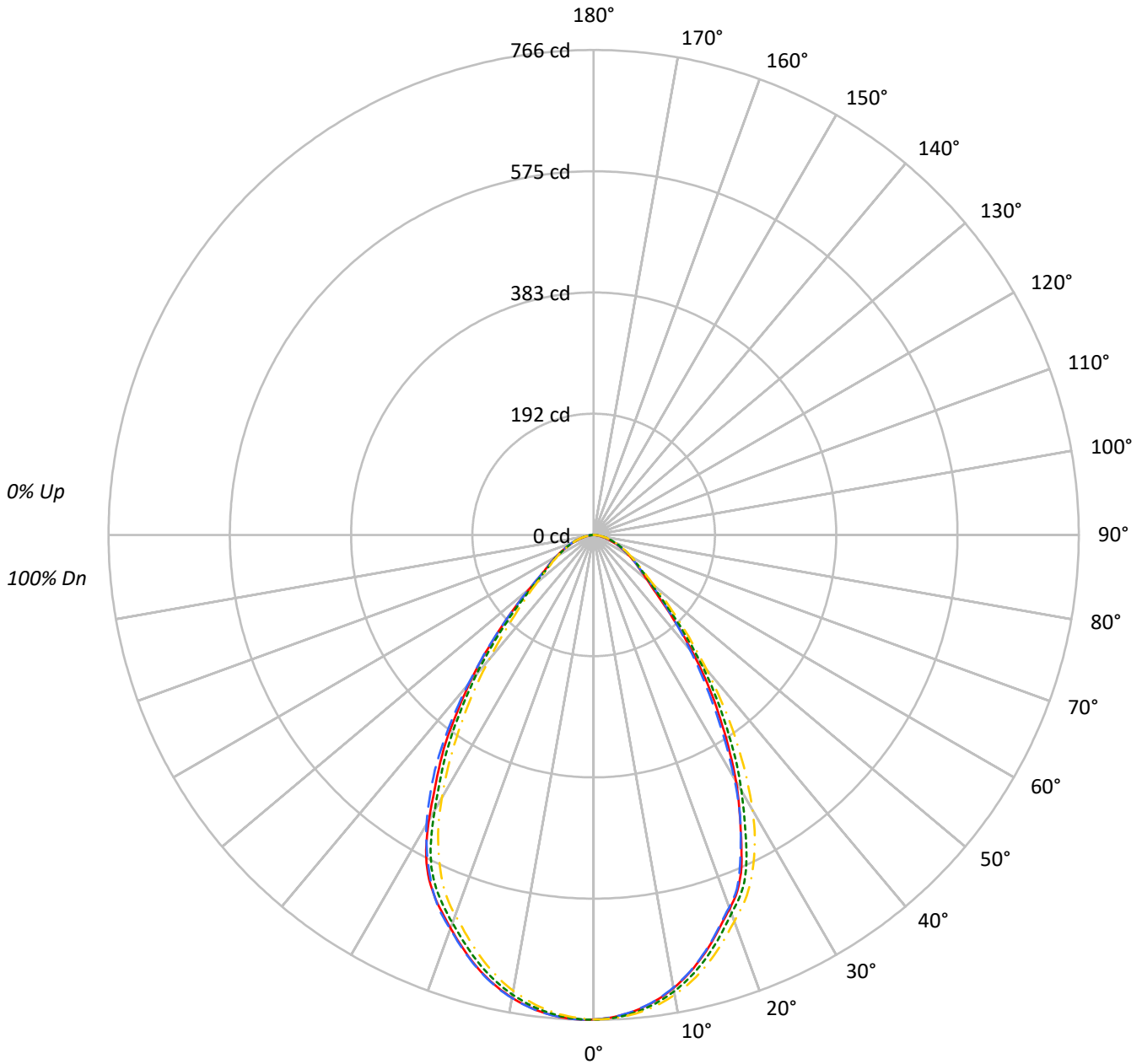
Lumens per Lamp: N/A
Luminaire Lumens: 1067.6 lumens
Efficiency: N/A
Efficacy: 106.8 lumens/watt
Spacing Criteria (0/90/45): 1.03 / 1.03 / 1.02
Luminous Opening: Circular (Dia: 0.33' x H: 0')
CIE Type: Direct

Input Watts (W): 10
Input Voltage (V): NR
Input Current (A_{in}): 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



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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	0					
RCR																										
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100								
1	112	108	105	102	109	106	103	100	102	99	97	98	96	94	95	93	92	90								
2	104	98	93	89	102	96	92	88	93	89	86	90	87	84	87	84	82	80								
3	97	89	83	78	95	88	82	77	85	80	76	82	78	75	80	76	73	72								
4	91	82	75	69	89	80	74	69	78	72	68	76	71	67	74	70	66	65								
5	85	75	68	62	83	74	67	62	72	66	61	70	65	61	68	64	60	58								
6	80	69	62	56	78	68	61	56	66	60	56	65	60	55	64	59	55	53								
7	75	64	57	51	74	63	56	51	62	56	51	60	55	51	59	54	50	49								
8	71	59	52	47	69	59	52	47	57	51	47	56	51	47	55	50	46	45								
9	67	55	48	44	65	55	48	43	54	48	43	53	47	43	52	47	43	41								
10	63	52	45	40	62	51	45	40	50	44	40	49	44	40	49	44	40	38								

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°	270°
0°	96325	96325	96325	96325
5°	95278	95645	96175	95885
10°	92866	93543	94859	94220
15°	88883	89939	92232	91268
20°	84146	85231	88485	87320
25°	76734	79233	84649	83122
30°	65306	67820	75566	72921
35°	52727	55554	63359	60686
40°	40118	43010	49877	47380
45°	28334	30808	36735	34421
50°	21615	22888	25824	24062
55°	18409	19199	19835	18913
60°	16109	16965	17241	16486
65°	13758	14979	14740	14383
70°	11664	13320	12547	12768
75°	9385	11913	10503	11232
80°	6523	10364	8045	9567
85°	2310	8231	3610	6931

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 202.5°
 Vertical Angle: 45°
 Luminance: 37233 cd/sqm



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	71.6	6.7
10°-20°	195.0	18.3
20°-30°	264.4	24.8
30°-40°	234.8	22.0
40°-50°	143.8	13.5
50°-60°	79.7	7.5
60°-70°	48.9	4.6
70°-80°	24.2	2.3
80°-90°	5.2	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°	531.0	49.7
0°-40°	765.7	71.7
0°-60°	989.2	92.7
0°-90°	1067.6	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1067.6	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	765	765	765	765	765	
5°	754	757	761	759	754	71
15°	682	690	708	700	682	191
25°	553	571	610	599	553	251
35°	343	362	412	395	343	214
45°	159	173	206	193	159	127
55°	84	88	90	86	84	76
65°	46	50	50	48	46	46
75°	19	24	22	23	19	21
85°	2	6	2	5	2	3
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°	765.4	765.4	765.4	765.4	765.4	765.4	765.4	765.4	765.4	765.4	765.4
0.5°	765.0	765.2	764.9	764.5	765.6	765.3	765.3	765.5	765.7	765.9	765.7
1°	764.5	764.6	764.4	764.0	765.3	765.2	765.2	765.6	765.8	766.0	765.8
1.5°	763.8	763.8	763.6	763.3	764.7	764.8	764.8	765.5	765.8	766.0	765.8
2°	762.9	762.8	762.6	762.4	764.1	764.3	764.5	765.0	765.6	765.9	765.6
2.5°	761.9	761.8	761.6	761.4	763.3	763.7	764.0	764.7	765.3	765.6	765.3
3°	760.6	760.6	760.4	760.2	762.3	762.8	763.4	764.2	764.7	765.0	764.7
3.5°	759.3	759.3	759.0	759.0	761.3	761.9	762.5	763.5	764.1	764.4	764.1
4°	757.8	757.7	757.4	757.5	760.0	760.8	761.5	762.6	763.4	763.7	763.4
4.5°	756.2	756.0	755.7	755.9	758.6	759.5	760.3	761.6	762.4	762.8	762.4
5°	754.2	754.1	753.9	754.1	757.1	758.1	759.1	760.4	761.3	761.8	761.4
5.5°	752.2	752.0	751.8	752.1	755.2	756.4	757.5	759.2	760.0	760.5	760.2
6°	750.1	749.8	749.6	749.9	753.3	754.8	756.0	757.7	758.6	759.2	759.0
6.5°	747.7	747.4	747.4	747.7	751.2	752.8	754.2	756.0	757.2	757.7	757.5
7°	745.3	745.0	744.9	745.3	749.0	750.7	752.3	754.2	755.6	756.1	755.8
7.5°	742.6	742.1	742.0	742.7	746.6	748.5	750.2	752.3	753.7	754.3	754.0
8°	739.8	739.4	739.2	739.8	743.8	746.0	748.0	750.2	751.6	752.3	752.0
8.5°	736.8	736.4	736.2	736.8	741.2	743.5	745.6	748.0	749.5	750.1	750.0
9°	733.6	733.1	732.9	733.7	738.3	740.8	743.1	745.5	747.3	748.0	747.8
9.5°	730.2	729.5	729.4	730.4	735.1	737.9	740.4	743.1	744.9	745.6	745.4
10°	726.7	726.0	725.9	726.8	732.0	734.9	737.5	740.4	742.3	743.2	742.9
10.5°	723.0	722.3	722.2	723.1	728.6	731.8	734.5	737.5	739.4	740.5	740.3
11°	719.1	718.4	718.2	719.4	724.8	728.3	731.2	734.6	736.6	737.6	737.4
11.5°	715.1	714.1	714.1	715.4	721.2	724.7	728.0	731.2	733.6	734.6	734.5
12°	710.8	710.0	709.9	711.2	717.4	721.0	724.4	728.0	730.5	731.5	731.2
12.5°	706.4	705.5	705.5	706.6	713.1	717.0	720.6	724.5	727.0	728.2	727.9
13°	701.9	701.0	700.8	702.2	708.9	713.1	716.8	720.9	723.6	724.8	724.5
13.5°	697.0	695.9	696.1	697.5	704.5	708.7	712.8	717.2	719.9	721.1	720.9
14°	692.4	691.2	691.1	692.6	699.9	704.3	708.5	713.1	716.1	717.4	716.9
14.5°	687.3	686.2	686.1	687.7	695.1	699.8	704.3	709.0	712.2	713.4	713.0
15°	682.2	680.8	680.7	682.5	690.3	695.1	699.9	704.7	707.9	709.3	708.9
15.5°	676.8	675.6	675.6	677.2	685.1	690.3	695.2	700.3	703.6	705.1	704.8
16°	671.4	670.1	670.0	671.8	680.0	685.3	690.5	695.9	699.3	700.8	700.3
16.5°	665.9	664.4	664.4	666.4	674.7	680.2	685.6	691.2	694.8	696.3	695.8
17°	660.4	658.8	658.9	660.9	669.3	674.9	680.7	686.5	690.1	691.6	691.3
17.5°	654.9	653.1	653.1	655.2	663.7	669.7	675.6	681.5	685.3	687.0	686.5
18°	649.0	647.3	647.2	649.4	658.2	664.2	670.4	676.5	680.5	682.2	681.8
18.5°	643.5	641.6	641.4	643.7	652.6	658.6	665.1	671.5	675.6	677.2	676.8
19°	638.3	636.3	636.0	638.2	646.9	653.3	659.7	666.3	670.6	672.4	671.9
19.5°	633.2	631.1	630.8	633.0	641.5	647.9	654.3	661.3	665.5	667.5	667.1
20°	628.3	626.1	625.9	628.0	636.4	642.9	649.5	656.2	660.7	662.6	662.4
20.5°	623.0	620.8	620.6	622.8	631.3	637.9	644.5	651.3	655.8	658.0	657.8
21°	617.8	615.6	615.5	617.8	626.3	633.1	639.6	646.4	651.1	653.5	653.3



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CATALOG NUMBER: HCDJBL510CSD-HCD4TRMW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
22.5°	598.9	595.7	595.5	599.1	610.4	617.6	624.5	631.7	636.5	639.0	638.7
23°	591.1	587.9	587.1	591.4	604.1	611.5	618.6	626.5	631.6	633.9	633.0
23.5°	582.8	579.5	578.1	583.3	596.9	604.8	612.5	621.2	626.4	628.2	627.1
24°	573.5	570.2	568.4	574.5	588.8	597.6	605.9	615.4	621.0	622.3	620.7
24.5°	563.4	560.8	558.8	565.2	580.2	590.0	598.9	609.4	615.4	616.0	614.1
25°	552.6	550.8	548.9	555.4	570.6	581.8	591.5	602.9	609.6	609.4	607.1
25.5°	542.0	540.3	539.3	545.2	560.7	572.6	583.8	596.2	603.4	602.4	599.6
26°	531.2	529.6	529.9	534.7	550.3	563.2	575.9	588.9	596.6	595.1	592.2
26.5°	520.5	518.2	520.3	524.0	539.1	553.3	567.5	581.0	589.2	587.2	584.5
27°	509.9	507.2	510.5	513.3	528.2	543.1	559.3	572.9	581.5	579.4	577.0
27.5°	499.8	496.1	500.4	502.2	517.7	532.8	550.8	564.5	572.9	571.2	569.5
28°	489.9	484.7	489.5	491.2	507.2	522.2	541.9	555.6	563.7	563.2	561.5
28.5°	480.0	474.0	478.4	480.5	497.0	512.2	532.5	546.6	553.5	554.7	553.6
29°	469.7	463.3	467.0	469.7	486.9	502.5	522.4	536.9	542.8	546.0	545.5
29.5°	459.7	452.7	455.5	458.9	476.8	492.8	512.1	526.8	531.7	536.9	536.9
30°	449.4	442.0	443.9	448.1	466.7	483.1	501.4	516.3	520.0	527.7	528.1
30.5°	439.0	431.6	432.0	437.1	456.7	473.6	490.6	504.9	508.1	517.6	518.5
31°	428.2	420.8	420.4	426.2	446.6	463.7	479.4	493.2	496.4	507.6	509.0
31.5°	417.5	410.0	409.0	415.5	436.1	453.7	468.0	481.0	485.0	497.2	498.8
32°	406.2	399.5	397.4	404.8	425.8	443.7	457.1	468.8	474.3	486.5	488.8
32.5°	395.2	388.7	385.9	394.0	415.4	433.4	446.2	456.6	463.8	475.2	478.8
33°	384.5	378.0	374.8	383.5	404.4	422.5	434.6	444.3	453.4	463.6	468.9
33.5°	373.9	367.8	363.6	373.1	393.4	411.7	423.1	432.5	443.1	452.2	458.3
34°	363.6	357.1	352.6	362.6	382.6	400.6	411.5	421.6	433.1	440.9	448.1
34.5°	353.3	346.6	341.8	352.1	372.1	389.1	400.2	410.1	422.7	429.6	436.8
35°	343.2	335.9	330.8	341.7	361.6	377.7	388.7	398.6	412.4	418.8	425.7
35.5°	333.4	325.9	320.6	331.3	351.6	366.8	377.5	387.6	401.4	408.2	414.0
36°	323.6	315.3	310.7	320.8	341.2	355.5	365.8	376.4	390.1	397.5	402.6
36.5°	313.6	305.0	301.0	310.1	331.5	344.7	354.8	365.3	378.8	386.8	390.7
37°	303.5	295.1	291.6	299.8	321.5	333.8	343.1	354.0	367.4	376.0	378.8
37.5°	293.5	285.3	282.1	289.5	311.6	323.3	331.9	342.7	356.1	365.6	367.2
38°	283.4	275.6	272.8	279.4	301.9	312.8	320.4	331.7	345.2	354.6	355.4
38.5°	273.3	265.8	263.4	270.0	292.0	302.5	309.5	320.9	335.0	343.8	343.5
39°	263.6	256.8	254.5	260.8	281.3	292.2	298.6	310.1	324.2	332.7	331.9
39.5°	253.8	247.8	245.7	251.8	271.5	281.9	288.4	299.9	314.0	321.8	320.3
40°	244.2	238.8	236.7	242.7	261.8	271.6	277.6	289.7	303.6	310.8	309.0
40.5°	235.0	230.1	228.4	234.1	251.8	260.9	267.3	279.9	294.3	300.0	297.7
41°	226.0	221.6	220.5	225.6	242.2	250.7	257.1	270.1	284.0	289.4	286.9
41.5°	217.0	213.2	212.6	217.4	233.0	240.7	247.6	260.8	273.5	278.9	276.4
42°	208.1	205.2	205.3	209.3	224.1	231.0	238.0	251.8	263.2	268.5	266.1
42.5°	199.6	197.6	198.1	201.4	215.1	221.3	229.0	242.7	253.6	258.4	256.2
43°	191.1	190.1	191.1	193.9	206.4	212.2	220.1	233.7	243.5	248.1	246.1
43.5°	182.6	182.8	184.0	186.5	197.7	203.3	211.8	225.1	233.7	238.1	236.3



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
45°	159.2	162.7	164.8	166.3	173.1	179.1	187.4	199.3	206.4	209.2	208.4
45.5°	152.5	156.5	158.8	160.1	165.5	171.6	180.1	191.2	198.0	200.1	199.5
46°	146.2	150.6	153.2	154.2	158.3	164.3	172.9	183.2	189.6	191.2	190.8
46.5°	140.2	144.9	147.6	148.4	151.5	157.7	165.8	175.5	181.6	182.4	182.5
47°	134.8	139.5	142.4	142.8	145.3	151.0	159.2	168.2	173.7	173.8	174.5
47.5°	129.8	134.2	137.3	137.6	139.5	144.8	152.9	160.9	166.1	165.9	166.9
48°	125.4	129.5	132.3	132.7	134.0	139.2	147.0	154.2	158.8	158.4	159.3
48.5°	121.2	124.9	127.6	127.9	129.1	133.8	141.4	147.8	151.7	151.2	152.2
49°	117.4	120.6	123.4	123.4	124.7	129.0	135.8	141.6	144.7	144.3	145.3
49.5°	113.7	116.5	119.1	119.1	120.6	124.3	130.8	135.8	138.2	137.9	138.9
50°	110.4	112.6	115.0	115.0	116.9	119.9	125.8	130.2	131.9	131.8	132.5
50.5°	107.2	108.9	110.9	111.2	113.2	116.0	121.2	125.0	126.2	126.2	126.7
51°	104.2	105.6	107.3	107.6	109.8	112.3	116.8	120.1	120.9	121.0	121.2
51.5°	101.1	102.2	103.8	104.2	106.6	108.8	112.6	115.4	116.0	116.2	116.0
52°	98.3	99.0	100.4	100.8	103.7	105.5	108.7	111.1	111.3	111.5	111.1
52.5°	95.5	96.0	97.2	97.8	100.6	102.3	104.9	106.9	107.1	107.2	106.6
53°	92.7	93.3	94.1	94.7	97.7	99.3	101.5	103.0	103.4	103.2	102.4
53.5°	90.2	90.6	91.3	91.9	94.8	96.3	98.1	99.6	99.7	99.6	98.7
54°	87.9	88.2	88.6	89.3	92.2	93.7	94.9	96.2	96.3	96.1	95.4
54.5°	85.9	86.1	86.4	87.1	89.6	90.9	92.0	93.1	93.3	92.8	92.2
55°	83.9	84.1	84.4	85.0	87.5	88.8	89.7	90.2	90.4	90.1	89.9
55.5°	81.9	82.1	82.4	83.0	85.4	86.5	87.5	88.0	88.2	87.9	87.6
56°	79.9	80.1	80.5	80.9	83.3	84.4	85.3	85.8	85.9	85.6	85.3
56.5°	77.8	78.1	78.5	79.0	81.2	82.2	83.0	83.6	83.6	83.4	83.1
57°	75.8	76.1	76.5	76.9	79.3	80.1	80.8	81.3	81.3	81.1	80.8
57.5°	73.8	74.2	74.4	74.9	77.2	78.0	78.7	79.2	79.4	79.0	78.6
58°	71.8	72.2	72.4	72.9	75.2	76.0	76.6	77.1	77.2	76.9	76.4
58.5°	69.8	70.2	70.5	71.0	73.2	73.9	74.5	75.1	75.0	74.8	74.3
59°	68.0	68.3	68.6	69.1	71.2	71.9	72.5	73.0	72.8	72.6	72.2
59.5°	66.0	66.4	66.7	67.1	69.3	70.0	70.4	70.9	70.7	70.5	70.1
60°	64.0	64.6	64.8	65.3	67.4	68.2	68.5	68.9	68.5	68.5	68.1
60.5°	62.1	62.7	63.0	63.4	65.6	66.2	66.6	66.9	66.4	66.4	66.1
61°	60.2	60.8	61.2	61.7	63.8	64.4	64.7	65.0	64.4	64.4	64.2
61.5°	58.4	59.0	59.6	60.0	62.0	62.6	62.8	63.1	62.4	62.4	62.3
62°	56.5	57.2	57.9	58.2	60.2	60.8	61.0	61.3	60.4	60.5	60.5
62.5°	54.7	55.6	56.1	56.5	58.4	59.0	59.3	59.4	58.5	58.6	58.7
63°	52.9	53.8	54.5	54.9	56.7	57.3	57.6	57.7	56.6	56.7	56.9
63.5°	51.3	52.1	52.8	53.3	55.0	55.7	55.9	55.8	54.7	54.9	55.2
64°	49.6	50.4	51.4	51.7	53.5	54.0	54.2	54.0	52.9	53.1	53.6
64.5°	47.9	48.8	49.8	50.2	51.9	52.4	52.6	52.3	51.2	51.5	52.0
65°	46.2	47.2	48.3	48.6	50.3	50.8	51.0	50.6	49.5	49.8	50.3
65.5°	44.6	45.6	46.7	47.2	48.8	49.3	49.6	48.9	47.7	48.1	48.7
66°	43.1	44.1	45.3	45.7	47.3	47.8	48.0	47.4	46.1	46.5	47.3



TEST NUMBER: P775688

CATALOG NUMBER: HCDJBL510CSD-HCD4TRMW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
67.5°	38.5	39.6	41.0	41.5	43.0	43.4	43.6	42.6	41.4	41.8	42.7
68°	37.2	38.1	39.6	40.1	41.6	42.0	42.2	41.2	39.9	40.3	41.3
68.5°	35.8	36.9	38.3	38.8	40.2	40.6	40.8	39.7	38.3	38.9	39.9
69°	34.5	35.5	37.0	37.5	38.9	39.3	39.4	38.2	37.0	37.5	38.5
69.5°	33.1	34.1	35.7	36.2	37.6	38.0	38.0	36.9	35.5	36.1	37.2
70°	31.7	32.8	34.5	35.1	36.2	36.7	36.8	35.5	34.1	34.8	35.8
70.5°	30.4	31.4	33.2	33.8	35.1	35.4	35.5	34.1	32.8	33.4	34.6
71°	29.1	30.1	31.9	32.6	33.8	34.1	34.1	32.8	31.5	32.0	33.3
71.5°	27.8	28.9	30.7	31.4	32.6	33.0	32.9	31.4	30.1	30.8	32.0
72°	26.5	27.6	29.4	30.1	31.3	31.7	31.6	30.1	28.9	29.5	30.8
72.5°	25.2	26.4	28.3	29.0	30.1	30.6	30.5	28.9	27.6	28.3	29.6
73°	23.9	25.1	27.0	27.8	29.0	29.3	29.2	27.6	26.4	27.0	28.4
73.5°	22.8	23.8	25.8	26.7	27.8	28.1	27.9	26.4	25.1	25.7	27.2
74°	21.6	22.7	24.7	25.6	26.7	27.1	26.9	25.2	23.9	24.6	26.0
74.5°	20.5	21.5	23.5	24.5	25.5	25.9	25.6	24.1	22.8	23.4	24.9
75°	19.3	20.4	22.4	23.4	24.5	24.8	24.6	22.8	21.6	22.3	23.7
75.5°	18.2	19.2	21.3	22.3	23.4	23.7	23.4	21.7	20.5	21.1	22.7
76°	17.1	18.2	20.2	21.3	22.3	22.7	22.3	20.5	19.3	20.0	21.6
76.5°	16.1	17.0	19.1	20.2	21.2	21.6	21.2	19.4	18.3	18.9	20.5
77°	15.0	16.0	18.1	19.2	20.2	20.6	20.2	18.3	17.1	17.8	19.4
77.5°	14.0	14.9	17.0	18.2	19.2	19.6	19.1	17.2	16.1	16.7	18.4
78°	12.9	13.9	16.1	17.2	18.2	18.6	18.1	16.2	15.0	15.8	17.3
78.5°	11.9	12.8	15.0	16.2	17.2	17.5	17.0	15.1	14.1	14.7	16.4
79°	10.9	11.8	14.1	15.2	16.2	16.6	16.1	14.1	13.0	13.7	15.4
79.5°	10.0	10.8	13.0	14.3	15.2	15.6	15.1	13.1	12.1	12.6	14.4
80°	9.0	9.9	12.1	13.3	14.3	14.7	14.1	12.1	11.1	11.7	13.4
80.5°	8.1	8.9	11.2	12.5	13.4	13.8	13.2	11.1	10.2	10.7	12.5
81°	7.1	8.0	10.3	11.6	12.5	12.8	12.3	10.2	9.2	9.9	11.7
81.5°	6.3	7.0	9.5	10.6	11.6	12.0	11.3	9.3	8.4	8.9	10.7
82°	5.4	6.2	8.6	9.8	10.7	11.0	10.5	8.5	7.5	8.0	9.9
82.5°	4.5	5.4	7.8	8.9	9.8	10.2	9.7	7.7	6.6	7.1	9.1
83°	3.7	4.6	7.0	8.1	9.0	9.3	8.9	6.8	5.7	6.2	8.4
83.5°	3.2	3.9	6.2	7.2	8.2	8.5	8.1	5.9	4.8	5.5	7.6
84°	2.6	3.5	5.6	6.5	7.4	7.7	7.2	5.1	4.0	4.7	6.8
84.5°	2.1	3.0	4.8	5.7	6.5	6.8	6.5	4.5	3.3	4.0	6.1
85°	1.6	2.5	4.1	4.8	5.7	6.0	5.7	3.9	2.5	3.5	5.4
85.5°	1.3	2.1	3.5	4.1	4.8	5.3	5.0	3.4	2.1	3.0	4.6
86°	0.9	1.7	2.8	3.4	4.1	4.5	4.3	2.9	1.8	2.6	4.0
86.5°	0.7	1.3	2.2	2.6	3.4	3.7	3.7	2.4	1.5	2.2	3.4
87°	0.4	0.8	1.5	1.9	2.6	2.9	2.9	2.0	1.2	1.8	2.7
87.5°	0.2	0.5	0.8	1.2	1.9	2.3	2.3	1.6	0.9	1.4	2.1
88°	0.1	0.2	0.3	0.5	1.3	1.6	1.7	1.2	0.6	1.1	1.5
88.5°	0.0	0.1	0.1	0.2	0.6	0.8	1.1	0.7	0.4	0.6	0.8



TEST NUMBER: P775688

CATALOG NUMBER: HCDJBL510CSD-HCD4TRMW-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	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0



TEST NUMBER: P775688

CATALOG NUMBER: HCDJBL510CSD-HCD4TRMW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
0°	765.4	765.4	765.4	765.4	765.4	765.4
0.5°	765.2	765.7	765.3	764.8	764.9	765.0
1°	765.3	765.6	764.9	764.4	764.4	764.5
1.5°	765.0	765.3	764.5	763.9	763.8	763.8
2°	764.8	764.8	764.0	763.2	762.9	762.9
2.5°	764.4	764.2	763.4	762.4	762.0	761.9
3°	763.9	763.5	762.4	761.5	760.8	760.6
3.5°	763.3	762.6	761.5	760.3	759.6	759.3
4°	762.4	761.7	760.2	759.2	758.2	757.8
4.5°	761.5	760.3	759.0	757.6	756.6	756.2
5°	760.4	759.0	757.4	756.0	754.9	754.2
5.5°	759.1	757.5	755.8	754.2	753.0	752.2
6°	757.6	755.9	753.9	752.3	751.0	750.1
6.5°	756.1	754.2	752.0	750.3	748.7	747.7
7°	754.4	752.2	749.9	748.0	746.2	745.3
7.5°	752.7	750.0	747.7	745.6	743.7	742.6
8°	750.6	747.9	745.3	743.0	741.0	739.8
8.5°	748.5	745.5	742.8	740.4	738.2	736.8
9°	746.1	742.9	740.0	737.3	734.9	733.6
9.5°	743.7	740.3	737.2	734.4	731.8	730.2
10°	741.1	737.3	734.2	731.2	728.4	726.7
10.5°	738.4	734.4	730.9	727.9	724.9	723.0
11°	735.3	731.2	727.5	724.3	721.1	719.1
11.5°	732.3	728.0	724.1	720.6	717.0	715.1
12°	729.0	724.4	720.4	716.5	713.1	710.8
12.5°	725.7	720.7	716.5	712.4	708.7	706.4
13°	722.1	716.9	712.6	708.3	704.4	701.9
13.5°	718.4	713.2	708.4	704.0	699.7	697.0
14°	714.5	709.1	704.2	699.5	694.9	692.4
14.5°	710.5	704.9	699.8	694.9	690.1	687.3
15°	706.3	700.5	695.2	689.9	685.0	682.2
15.5°	702.0	695.8	690.5	685.1	680.0	676.8
16°	697.6	691.3	685.6	680.1	674.8	671.4
16.5°	693.1	686.6	680.7	675.0	669.4	665.9
17°	688.4	681.5	675.7	669.9	664.0	660.4
17.5°	683.6	676.8	670.5	664.4	658.4	654.9
18°	678.8	671.8	665.5	659.2	653.0	649.0
18.5°	673.9	666.6	660.3	653.9	647.6	643.5
19°	668.7	661.9	655.3	648.9	642.6	638.3
19.5°	664.0	656.9	650.4	644.0	637.6	633.2
20°	659.4	652.0	645.7	639.1	632.7	628.3
20.5°	654.8	647.4	640.7	634.2	627.6	623.0
21°	650.0	642.5	635.9	629.1	622.4	617.8

TEST NUMBER: P775688

CATALOG NUMBER: HCDJBL510CSD-HCD4TRMW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
22.5°	635.5	627.6	620.2	611.7	603.9	598.9
23°	630.2	622.4	614.7	605.3	596.9	591.1
23.5°	624.5	616.8	608.8	598.3	589.0	582.8
24°	618.3	611.4	602.4	590.9	580.6	573.5
24.5°	611.9	605.0	595.6	583.0	571.7	563.4
25°	605.1	598.6	588.4	575.0	562.4	552.6
25.5°	597.9	591.5	580.8	566.9	552.7	542.0
26°	590.5	584.3	572.8	558.7	542.6	531.2
26.5°	582.4	575.8	564.2	549.9	532.2	520.5
27°	574.5	567.2	555.3	540.9	522.0	509.9
27.5°	566.5	557.4	546.1	531.7	511.7	499.8
28°	558.2	547.1	536.4	521.9	501.7	489.9
28.5°	549.7	536.2	526.2	511.7	491.9	480.0
29°	540.9	525.2	515.6	501.1	482.1	469.7
29.5°	532.1	513.5	504.6	490.3	472.4	459.7
30°	522.5	501.8	493.1	479.3	462.8	449.4
30.5°	512.7	490.5	481.1	468.2	452.8	439.0
31°	502.4	479.4	468.6	457.1	442.4	428.2
31.5°	491.8	468.6	456.7	445.5	432.1	417.5
32°	480.9	458.1	444.8	434.2	421.7	406.2
32.5°	469.7	447.9	433.1	422.7	411.0	395.2
33°	458.3	437.7	422.0	411.4	399.4	384.5
33.5°	446.7	427.5	410.7	399.9	388.3	373.9
34°	435.5	417.2	399.9	388.5	376.6	363.6
34.5°	424.3	406.0	388.8	376.9	365.2	353.3
35°	413.4	395.0	377.8	365.4	353.5	343.2
35.5°	402.7	383.9	366.7	354.2	342.7	333.4
36°	392.0	372.6	355.4	343.1	331.7	323.6
36.5°	381.3	361.6	344.3	332.1	321.1	313.6
37°	370.7	350.3	333.2	320.8	310.6	303.5
37.5°	359.6	339.5	322.2	309.8	300.6	293.5
38°	348.7	329.0	311.4	298.9	290.1	283.4
38.5°	337.9	318.8	300.8	288.3	279.9	273.3
39°	327.2	308.7	290.8	277.6	269.5	263.6
39.5°	316.0	298.5	280.9	267.2	259.0	253.8
40°	305.2	288.4	271.2	256.9	248.7	244.2
40.5°	294.3	278.3	261.7	246.9	238.6	235.0
41°	284.2	268.0	252.3	237.2	228.7	226.0
41.5°	273.5	258.2	243.1	228.0	219.1	217.0
42°	263.3	248.1	233.9	218.9	210.1	208.1
42.5°	253.0	238.3	225.5	210.5	201.4	199.6
43°	243.4	228.7	216.5	202.1	193.0	191.1
43.5°	233.2	219.5	207.9	193.9	185.0	182.6



TEST NUMBER: P775688

CATALOG NUMBER: HCDJBL510CSD-HCD4TRMW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
45°	205.1	193.4	183.0	171.4	162.8	159.2
45.5°	195.9	185.2	175.3	164.6	156.2	152.5
46°	187.3	177.3	167.9	158.2	149.8	146.2
46.5°	178.7	169.4	160.7	151.9	143.8	140.2
47°	170.5	162.0	153.8	145.7	138.1	134.8
47.5°	162.7	154.6	147.4	140.0	132.9	129.8
48°	155.1	147.7	141.0	134.8	128.0	125.4
48.5°	148.3	140.8	135.1	129.7	123.4	121.2
49°	141.4	134.5	129.6	124.9	119.2	117.4
49.5°	135.2	128.6	124.4	120.3	115.3	113.7
50°	129.3	122.9	119.3	115.8	111.6	110.4
50.5°	123.7	117.5	114.6	111.8	108.2	107.2
51°	118.5	112.8	110.3	107.9	104.8	104.2
51.5°	113.7	108.4	106.2	104.3	101.7	101.1
52°	109.2	104.3	102.5	100.7	98.7	98.3
52.5°	105.0	100.6	98.9	97.5	95.8	95.5
53°	101.1	97.2	95.6	94.3	93.1	92.7
53.5°	97.5	94.0	92.4	91.5	90.4	90.2
54°	94.1	91.1	89.7	88.9	88.1	87.9
54.5°	91.2	88.5	87.4	86.7	86.0	85.9
55°	89.0	86.2	85.3	84.7	84.0	83.9
55.5°	86.7	84.2	83.2	82.6	81.9	81.9
56°	84.4	82.1	81.1	80.6	79.9	79.9
56.5°	82.2	80.0	79.1	78.5	77.8	77.8
57°	79.9	77.8	77.0	76.4	75.8	75.8
57.5°	77.8	75.6	74.8	74.3	73.8	73.8
58°	75.7	73.6	72.8	72.3	71.8	71.8
58.5°	73.6	71.5	70.7	70.3	69.8	69.8
59°	71.4	69.5	68.7	68.3	68.0	68.0
59.5°	69.4	67.4	66.7	66.4	66.1	66.0
60°	67.4	65.5	64.8	64.5	64.2	64.0
60.5°	65.4	63.5	62.9	62.7	62.4	62.1
61°	63.5	61.8	61.1	60.8	60.6	60.2
61.5°	61.7	60.0	59.3	59.0	58.7	58.4
62°	59.9	58.2	57.7	57.3	57.0	56.5
62.5°	58.1	56.4	55.8	55.7	55.2	54.7
63°	56.3	54.7	54.2	54.0	53.6	52.9
63.5°	54.7	53.0	52.5	52.4	51.9	51.3
64°	53.0	51.5	50.9	50.8	50.2	49.6
64.5°	51.4	49.9	49.4	49.3	48.6	47.9
65°	49.8	48.3	47.9	47.8	47.1	46.2
65.5°	48.2	46.8	46.4	46.2	45.5	44.6
66°	46.7	45.4	45.0	44.8	43.9	43.1



TEST NUMBER: P775688

CATALOG NUMBER: HCDJBL510CSD-HCD4TRMW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
67.5°	42.4	41.1	40.8	40.5	39.4	38.5
68°	41.0	39.7	39.4	39.3	37.8	37.2
68.5°	39.7	38.4	37.9	37.8	36.6	35.8
69°	38.3	37.2	36.8	36.6	35.3	34.5
69.5°	37.0	35.9	35.5	35.3	33.9	33.1
70°	35.7	34.7	34.3	34.1	32.7	31.7
70.5°	34.5	33.5	33.1	32.9	31.3	30.4
71°	33.3	32.2	31.8	31.6	30.0	29.1
71.5°	32.0	31.0	30.7	30.4	28.8	27.8
72°	30.9	29.8	29.5	29.2	27.5	26.5
72.5°	29.6	28.7	28.4	27.9	26.3	25.2
73°	28.5	27.5	27.2	26.8	25.1	23.9
73.5°	27.3	26.4	26.0	25.6	23.8	22.8
74°	26.3	25.3	25.0	24.5	22.7	21.6
74.5°	25.1	24.2	23.8	23.4	21.5	20.5
75°	24.1	23.1	22.8	22.3	20.4	19.3
75.5°	23.0	22.1	21.7	21.2	19.3	18.2
76°	22.0	21.0	20.7	20.1	18.2	17.1
76.5°	20.9	20.0	19.6	19.0	17.0	16.1
77°	19.9	19.0	18.7	18.0	16.0	15.0
77.5°	18.9	18.0	17.6	17.0	14.9	14.0
78°	17.9	17.0	16.7	16.0	13.9	12.9
78.5°	16.9	16.1	15.8	15.0	12.9	11.9
79°	16.0	15.1	14.8	14.0	11.9	10.9
79.5°	15.0	14.2	13.9	13.0	10.9	10.0
80°	14.1	13.2	12.9	12.2	10.0	9.0
80.5°	13.1	12.4	12.1	11.2	9.0	8.1
81°	12.3	11.4	11.1	10.3	8.1	7.1
81.5°	11.3	10.6	10.3	9.5	7.2	6.3
82°	10.5	9.8	9.5	8.6	6.4	5.4
82.5°	9.7	8.9	8.6	7.9	5.6	4.5
83°	8.9	8.1	7.8	7.0	4.8	3.7
83.5°	8.1	7.2	6.9	6.3	4.2	3.2
84°	7.2	6.4	6.1	5.6	3.7	2.6
84.5°	6.4	5.7	5.4	4.8	3.3	2.1
85°	5.7	4.8	4.6	4.1	2.7	1.6
85.5°	4.8	4.1	3.8	3.5	2.2	1.3
86°	4.1	3.5	3.2	2.7	1.8	0.9
86.5°	3.4	2.7	2.4	2.1	1.4	0.7
87°	2.7	2.0	1.7	1.4	0.9	0.4
87.5°	2.0	1.3	0.9	0.7	0.5	0.2
88°	1.3	0.6	0.4	0.3	0.2	0.1
88.5°	0.6	0.2	0.1	0.1	0.1	0.0



TEST NUMBER: P775688

CATALOG NUMBER: HCDJBL510CSD-HCD4TRMW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

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



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

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21.5°	612.3	609.5	609.7	612.2	621.4	628.1	634.8	641.5	646.2	648.7	648.6
22°	606.0	602.9	603.1	605.9	616.2	623.1	630.1	636.6	641.4	644.0	643.8



44°	174.5	175.8	177.5	179.6	189.2	195.0	203.3	216.3	224.2	228.3	226.8
44.5°	166.8	169.1	170.8	172.9	181.1	187.0	195.0	207.9	215.4	218.6	217.4



66.5°	41.6	42.5	43.9	44.2	45.8	46.3	46.4	45.7	44.4	44.8	45.7
67°	40.0	41.1	42.4	42.9	44.4	44.8	45.1	44.2	43.0	43.4	44.2



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

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21.5°	645.2	637.4	630.8	623.8	616.7	612.3
22°	640.6	632.7	625.7	617.9	610.7	606.0



44°	223.7	210.4	199.5	186.1	177.2	174.5
44.5°	214.2	201.8	191.3	178.6	169.8	166.8

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66.5°	45.3	43.9	43.5	43.4	42.3	41.6
67°	43.8	42.4	42.1	42.0	40.9	40.0

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

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(END OF REPORT)