

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: P775636

Luminaire Tested: HCDJBL510CSD-HCD41TRMW-1000lm-3000K

Issue Date: 2/13/2024

Test Information

Test Method: LM-79-2019
Report Number: P775636
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (A2312156B030)
Test Lab:
Issue Date: 2/13/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO COMMERCIAL
Catalog Number: HCDJBL510CSD-HCD41TRMW-1000lm-3000K
Description: 4 INCH ROUND SHALLOW-WIDE MATTE WHITE TRIM
Light Source: SELECTABLE LUMENS AND CCT ARRAY 90CRI / 3000K CCT
Ballast/Driver: -

Summary

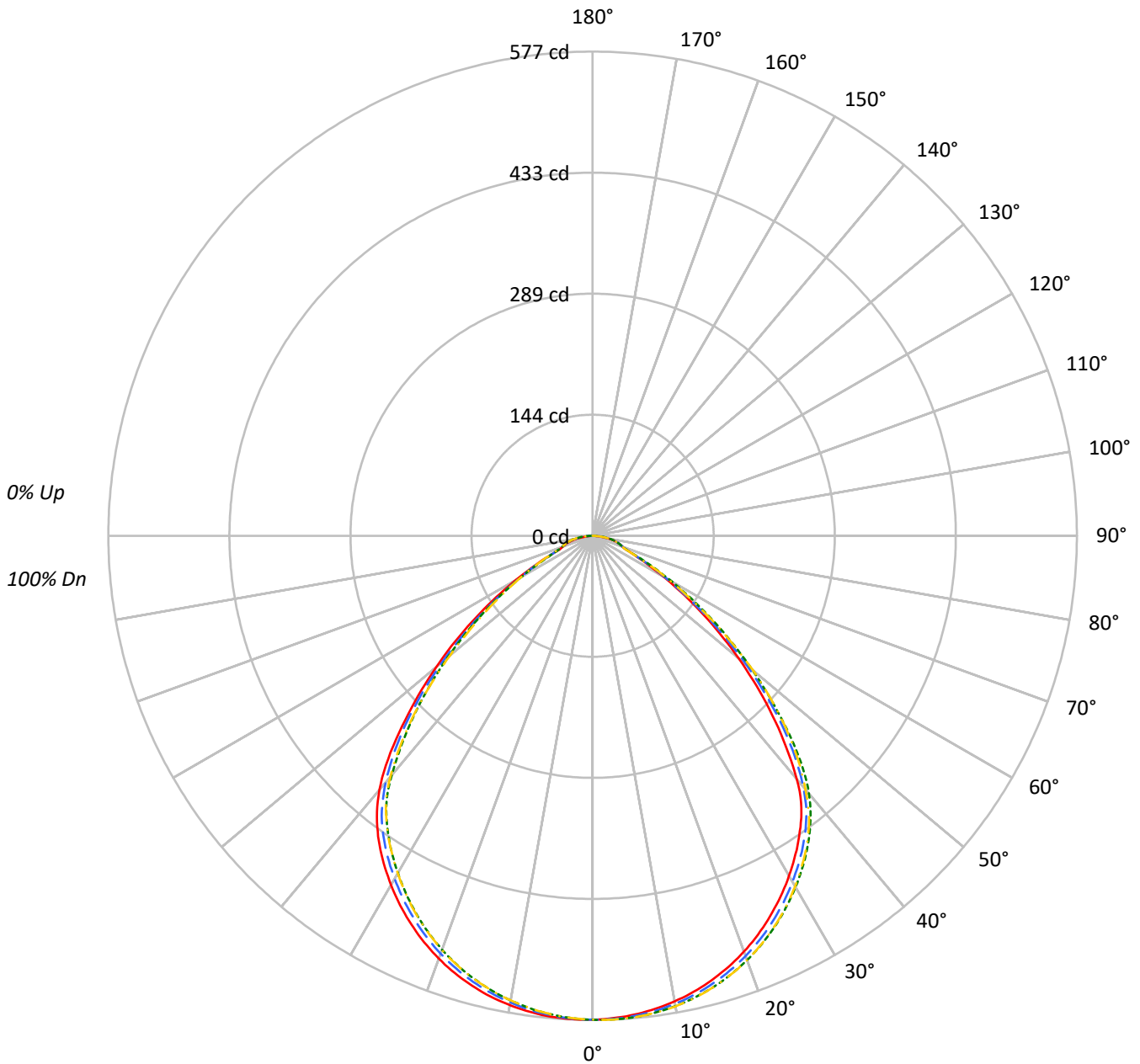
Lumens per Lamp: N/A
Luminaire Lumens: 1204.3 lumens
Efficiency: N/A
Efficacy: 120.4 lumens/watt
Spacing Criteria (0/90/45): 1.22 / 1.22 / 1.28
Luminous Opening: Circular (Dia: 0.33' x H: 0')
CIE Type: Direct

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	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	107	103	100	108	105	102	99	101	98	96	97	95	93	93	92	90	88	88	88	88	88	88		
	2	103	96	90	85	100	94	89	84	90	86	82	87	84	81	84	81	79	77	77	77	77	77	77		
	3	95	86	79	73	93	84	78	73	82	76	72	79	74	70	76	73	69	67	67	67	67	67	67		
	4	88	77	70	64	86	76	69	64	74	68	63	72	66	62	69	65	61	59	59	59	59	59	59		
	5	81	70	62	56	79	69	62	56	67	60	55	65	59	55	63	58	54	52	52	52	52	52	52		
	6	76	64	56	50	74	63	55	50	61	54	49	60	54	49	58	53	49	47	47	47	47	47	47		
	7	71	58	50	45	69	57	50	45	56	49	44	55	49	44	53	48	44	42	42	42	42	42	42		
	8	66	54	46	40	64	53	45	40	52	45	40	50	44	40	49	44	40	38	38	38	38	38	38		
	9	62	49	42	37	60	49	42	37	48	41	36	47	41	36	46	40	36	34	34	34	34	34	34		
	10	58	46	38	33	57	45	38	33	44	38	33	43	37	33	43	37	33	31	31	31	31	31	31		

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°	270°
0°	72578	72578	72578	72578
5°	72362	72754	72665	72312
10°	71985	72739	72573	71857
15°	71438	72519	72324	71203
20°	70619	72066	71798	70285
25°	69485	71332	70971	69013
30°	68009	70247	69826	67428
35°	66124	68782	68214	65479
40°	62166	65878	64926	61147
45°	53963	58430	57167	53251
50°	44424	48555	47576	44052
55°	34316	37958	37212	34316
60°	24490	27259	26705	24591
65°	16616	17808	17361	16646
70°	13872	13799	13909	14166
75°	14587	14685	14101	15365
80°	13625	15147	12321	16307
85°	7509	13862	5343	15739

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 112.5°
 Vertical Angle: 45°
 Luminance: 59356 cd/sqm



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	54.5	4.5
10°-20°	155.5	12.9
20°-30°	232.7	19.3
30°-40°	272.1	22.6
40°-50°	240.6	20.0
50°-60°	146.4	12.2
60°-70°	61.0	5.1
70°-80°	31.7	2.6
80°-90°	9.7	0.8
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°	442.8	36.8
0°-40°	714.8	59.4
0°-60°	1101.9	91.5
0°-90°	1204.3	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1204.3	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	577	577	577	577	577	
5°	573	576	575	572	573	54
15°	548	557	555	546	548	155
25°	500	514	511	497	500	230
35°	430	448	444	426	430	268
45°	303	328	321	299	303	233
55°	156	173	170	156	156	141
65°	56	60	58	56	56	59
75°	30	30	29	32	30	31
85°	5	10	4	11	5	8
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°	576.7	576.7	576.7	576.7	576.7	576.7	576.7	576.7	576.7	576.7	576.7
0.5°	576.6	576.7	576.8	576.6	577.0	577.1	576.9	576.8	576.8	576.8	576.7
1°	576.4	576.6	576.7	576.7	577.1	577.2	577.1	576.9	576.8	576.8	576.6
1.5°	576.1	576.4	576.6	576.7	577.1	577.3	577.1	576.9	576.8	576.7	576.4
2°	575.8	576.1	576.5	576.6	577.1	577.3	577.1	576.9	576.7	576.5	576.2
2.5°	575.4	575.8	576.3	576.5	577.0	577.3	577.1	576.8	576.6	576.3	575.9
3°	575.0	575.5	576.0	576.3	576.9	577.2	576.9	576.7	576.4	576.1	575.6
3.5°	574.6	575.1	575.7	576.1	576.7	577.1	576.8	576.5	576.2	575.7	575.2
4°	574.1	574.6	575.3	575.8	576.5	576.9	576.5	576.2	575.9	575.4	574.7
4.5°	573.4	574.1	574.8	575.4	576.2	576.6	576.3	575.9	575.5	575.0	574.2
5°	572.8	573.5	574.3	575.0	575.9	576.3	575.9	575.6	575.2	574.5	573.5
5.5°	572.1	572.8	573.8	574.6	575.4	576.0	575.5	575.1	574.7	573.9	572.9
6°	571.3	572.2	573.1	574.1	575.0	575.5	575.1	574.7	574.2	573.3	572.2
6.5°	570.5	571.4	572.5	573.4	574.5	575.1	574.6	574.2	573.7	572.7	571.5
7°	569.7	570.6	571.8	572.8	573.9	574.5	574.0	573.5	572.9	572.0	570.8
7.5°	568.8	569.8	571.0	572.1	573.2	574.0	573.3	572.9	572.2	571.2	569.9
8°	567.8	568.9	570.3	571.4	572.4	573.2	572.6	572.2	571.5	570.4	569.0
8.5°	566.8	567.9	569.3	570.6	571.7	572.6	571.9	571.4	570.7	569.6	568.0
9°	565.7	566.9	568.3	569.8	570.9	571.8	571.1	570.6	569.9	568.5	567.0
9.5°	564.6	565.8	567.4	568.8	570.1	571.0	570.3	569.8	569.0	567.6	565.9
10°	563.3	564.7	566.3	567.8	569.2	570.1	569.4	568.9	567.9	566.6	564.8
10.5°	562.1	563.5	565.2	566.7	568.1	569.2	568.3	567.8	566.9	565.5	563.6
11°	560.8	562.2	564.1	565.7	567.1	568.1	567.3	566.7	565.9	564.3	562.3
11.5°	559.5	561.0	562.8	564.6	566.0	567.1	566.2	565.7	564.7	563.0	561.0
12°	558.0	559.6	561.5	563.2	564.9	566.0	565.1	564.6	563.5	561.8	559.7
12.5°	556.5	558.1	560.2	562.0	563.6	564.9	563.9	563.2	562.3	560.5	558.2
13°	555.1	556.7	558.7	560.7	562.3	563.6	562.5	562.0	561.0	559.1	556.8
13.5°	553.3	555.2	557.2	559.4	561.0	562.3	561.2	560.7	559.6	557.6	555.3
14°	551.8	553.6	555.8	557.9	559.6	561.0	559.9	559.3	558.1	556.1	553.6
14.5°	550.1	552.0	554.2	556.4	558.1	559.6	558.3	557.7	556.6	554.6	552.0
15°	548.3	550.3	552.6	554.9	556.6	558.1	556.9	556.3	555.1	552.9	550.3
15.5°	546.5	548.4	550.9	553.1	555.1	556.5	555.3	554.7	553.4	551.3	548.5
16°	544.6	546.6	549.1	551.5	553.4	555.0	553.5	553.0	551.7	549.5	546.7
16.5°	542.6	544.8	547.3	549.8	551.7	553.2	551.9	551.3	550.1	547.7	544.8
17°	540.7	542.8	545.5	547.9	550.0	551.5	550.2	549.5	548.1	545.9	542.8
17.5°	538.6	540.8	543.5	546.2	548.1	549.8	548.2	547.6	546.3	543.8	540.8
18°	536.5	538.7	541.5	544.3	546.3	547.8	546.4	545.8	544.5	541.9	538.7
18.5°	534.3	536.6	539.5	542.2	544.4	545.9	544.5	543.8	542.4	539.9	536.6
19°	532.0	534.5	537.3	540.2	542.3	543.9	542.4	541.8	540.5	537.8	534.5
19.5°	529.7	532.2	535.2	538.1	540.3	541.9	540.3	539.8	538.3	535.6	532.2
20°	527.3	529.9	532.9	536.0	538.1	539.9	538.1	537.5	536.1	533.4	529.9
20.5°	525.0	527.5	530.7	533.7	536.0	537.6	535.9	535.3	533.8	531.1	527.4
21°	522.3	525.1	528.2	531.5	533.7	535.5	533.6	533.0	531.6	528.7	525.1



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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°	514.6	517.4	520.9	524.2	526.7	528.4	526.4	525.9	524.3	521.4	517.4
23°	511.8	514.8	518.2	521.8	524.2	526.0	523.8	523.3	521.8	518.8	514.7
23.5°	509.0	512.0	515.6	519.1	521.7	523.4	521.3	520.7	519.2	516.1	512.0
24°	506.2	509.2	512.9	516.6	519.0	520.9	518.6	518.0	516.6	513.4	509.2
24.5°	503.3	506.4	510.2	513.8	516.4	518.2	516.0	515.4	513.8	510.7	506.4
25°	500.4	503.4	507.3	511.1	513.7	515.5	513.1	512.6	511.1	507.9	503.5
25.5°	497.4	500.6	504.4	508.3	511.0	512.7	510.4	509.8	508.3	505.1	500.6
26°	494.2	497.6	501.5	505.5	508.1	510.0	507.5	506.9	505.5	502.1	497.5
26.5°	491.3	494.5	498.5	502.6	505.2	507.1	504.5	503.9	502.4	499.2	494.5
27°	488.1	491.4	495.5	499.5	502.3	504.2	501.5	501.0	499.4	496.2	491.5
27.5°	484.8	488.3	492.5	496.6	499.2	501.2	498.5	497.9	496.5	493.0	488.3
28°	481.6	485.1	489.2	493.5	496.2	498.1	495.4	494.9	493.3	490.1	485.1
28.5°	478.2	481.8	486.1	490.4	493.2	495.1	492.2	491.7	490.2	486.7	481.8
29°	474.9	478.4	482.8	487.2	490.0	491.9	488.9	488.5	487.0	483.6	478.5
29.5°	471.5	475.2	479.5	483.9	486.8	488.7	485.7	485.3	483.7	480.3	475.3
30°	468.0	471.8	476.2	480.7	483.4	485.5	482.4	481.9	480.5	477.0	471.8
30.5°	464.4	468.3	472.8	477.4	480.2	482.1	479.0	478.5	477.1	473.5	468.3
31°	460.9	464.7	469.4	473.9	476.8	478.8	475.6	475.0	473.6	470.1	464.8
31.5°	457.3	461.3	465.9	470.6	473.3	475.4	472.1	471.6	470.1	466.7	461.5
32°	453.7	457.7	462.3	467.1	469.8	471.9	468.5	468.1	466.7	463.3	457.8
32.5°	449.9	454.0	458.8	463.5	466.5	468.4	464.9	464.5	463.1	459.7	454.1
33°	446.3	450.3	455.1	459.9	462.8	464.8	461.3	460.9	459.5	456.1	450.4
33.5°	442.5	446.6	451.5	456.4	459.1	461.2	457.6	457.1	455.8	452.3	446.7
34°	438.5	442.8	447.6	452.6	455.5	457.5	453.6	453.2	451.9	448.4	442.8
34.5°	434.6	438.8	443.8	448.7	451.7	453.5	449.8	449.3	448.0	444.6	438.9
35°	430.4	434.8	439.8	444.8	447.7	449.6	445.8	445.3	444.0	440.6	434.9
35.5°	426.4	430.7	435.7	440.9	443.7	445.7	441.8	441.3	440.0	436.6	430.9
36°	422.2	426.6	431.7	436.8	439.7	441.7	437.5	436.9	435.7	432.3	426.6
36.5°	417.8	422.3	427.4	432.7	435.4	437.4	433.0	432.5	431.3	427.9	422.2
37°	413.3	417.8	422.9	428.1	431.0	432.9	428.5	428.0	426.8	423.4	417.7
37.5°	408.5	413.2	418.4	423.7	426.5	428.4	423.6	423.3	422.2	418.7	412.5
38°	403.5	408.3	413.8	419.0	421.8	423.8	418.3	418.2	417.4	413.7	407.1
38.5°	397.9	402.7	408.3	414.2	417.0	418.8	412.6	412.5	412.2	408.6	401.6
39°	392.0	396.6	402.4	408.9	411.9	413.5	406.7	406.8	406.8	403.1	395.5
39.5°	385.4	390.3	396.6	403.5	406.6	407.9	400.7	400.7	401.1	397.3	389.6
40°	378.4	383.7	390.4	397.5	401.0	401.9	394.5	394.3	395.2	391.1	383.2
40.5°	371.1	376.6	383.9	391.5	395.1	395.6	388.3	388.0	388.9	384.7	377.2
41°	363.8	369.6	377.4	384.9	388.9	389.3	382.1	381.7	382.2	378.2	370.3
41.5°	356.4	362.5	370.5	378.3	382.2	382.9	375.5	374.9	375.2	371.4	363.7
42°	348.7	355.0	363.7	371.4	375.2	376.2	369.0	368.4	368.1	364.5	356.7
42.5°	341.2	347.6	356.6	364.5	367.9	369.4	362.2	361.4	360.6	357.3	349.7
43°	333.7	340.2	349.5	357.3	360.3	362.4	355.3	354.4	353.0	349.9	342.4
43.5°	326.1	332.8	341.8	349.9	352.4	355.4	348.4	347.3	345.0	342.4	335.2



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
45°	303.2	310.4	319.0	326.6	328.3	333.5	326.5	325.1	321.2	318.7	312.4
45.5°	295.5	302.9	311.1	318.6	320.0	325.6	319.3	317.4	313.2	310.5	304.8
46°	287.9	295.3	303.2	310.3	311.6	318.0	311.5	309.5	305.2	302.3	296.7
46.5°	280.3	287.6	295.2	302.0	303.6	310.1	303.9	301.7	297.2	294.2	288.8
47°	272.4	280.1	287.2	293.7	295.6	302.0	296.2	294.0	289.5	286.0	280.9
47.5°	264.8	272.3	279.0	285.4	287.5	294.0	288.7	285.9	281.7	278.0	273.0
48°	257.1	264.5	271.1	277.0	279.6	285.9	280.7	277.9	273.9	269.8	264.9
48.5°	249.5	256.8	262.9	268.7	271.7	277.8	273.0	269.9	266.1	261.8	257.1
49°	241.9	249.1	255.0	260.5	263.8	269.9	264.9	262.0	258.4	253.8	249.1
49.5°	234.4	241.1	247.0	252.2	255.8	261.7	256.8	254.1	250.7	245.9	241.2
50°	226.9	233.4	239.0	244.1	248.0	253.8	249.0	246.1	243.0	237.9	233.3
50.5°	219.5	225.6	231.0	235.9	240.3	245.8	240.7	238.3	235.3	230.3	225.5
51°	212.0	217.9	223.1	227.9	232.4	237.7	232.9	230.7	227.8	222.7	217.8
51.5°	204.9	210.5	215.4	220.0	224.8	230.2	224.8	222.9	220.4	215.1	210.3
52°	197.6	202.9	207.6	212.3	217.2	222.3	216.6	215.2	213.1	207.4	202.7
52.5°	190.6	195.5	200.0	204.7	209.6	214.5	208.8	207.6	205.6	200.1	195.1
53°	183.5	188.1	192.2	197.1	202.1	206.7	201.0	200.2	198.1	192.6	187.7
53.5°	176.6	180.9	184.8	189.7	194.6	199.2	193.3	192.6	190.8	185.6	180.5
54°	169.7	173.7	177.2	182.4	187.4	191.7	185.4	185.3	183.9	178.3	173.5
54.5°	163.0	166.5	170.1	175.2	180.3	184.3	177.9	178.1	176.8	171.4	166.6
55°	156.4	159.6	163.0	168.2	173.0	177.2	170.5	171.0	169.6	164.4	159.5
55.5°	149.9	152.9	155.9	161.3	166.0	170.0	163.1	163.9	162.7	157.8	152.8
56°	143.6	146.3	148.9	154.6	159.0	162.6	156.0	156.8	156.2	151.1	146.4
56.5°	137.3	139.6	142.4	148.0	152.3	155.7	148.9	150.0	149.3	144.6	139.9
57°	131.2	133.3	135.9	141.6	145.6	148.9	142.1	143.3	142.7	138.4	133.7
57.5°	125.1	127.0	129.4	135.1	139.0	142.1	135.5	136.8	136.3	132.3	127.5
58°	119.2	120.9	123.1	129.1	132.5	135.3	129.0	130.3	130.1	126.3	121.7
58.5°	113.5	114.9	117.2	123.0	126.5	128.9	122.7	123.8	123.8	120.4	116.0
59°	108.0	109.2	111.6	117.4	120.1	122.6	116.6	117.6	117.7	114.7	110.2
59.5°	102.6	103.6	106.0	111.5	114.1	116.4	110.5	111.7	111.8	109.1	104.9
60°	97.3	98.2	100.6	106.0	108.3	110.2	104.7	105.7	106.1	103.7	99.7
60.5°	92.3	93.0	95.4	100.5	102.7	104.4	99.3	99.9	100.4	98.5	94.6
61°	87.3	88.0	90.4	95.3	97.2	98.9	94.3	94.5	95.0	93.7	90.1
61.5°	82.6	83.3	85.7	90.1	92.2	93.8	89.2	89.5	90.0	88.9	85.7
62°	78.1	78.8	81.1	85.3	87.2	88.6	84.2	84.4	85.0	84.1	81.3
62.5°	73.8	74.4	76.8	80.5	82.3	83.5	79.2	79.3	80.0	79.3	76.8
63°	69.7	70.2	72.6	75.9	77.3	78.3	74.2	74.3	75.1	74.5	72.3
63.5°	65.9	66.3	68.6	71.6	72.3	73.2	69.6	69.8	70.7	70.2	68.3
64°	62.3	62.8	64.8	67.3	68.0	68.7	65.4	65.4	66.4	66.2	64.5
64.5°	58.8	59.3	61.2	63.4	63.8	64.5	61.6	61.6	62.4	62.4	61.0
65°	55.8	56.1	57.9	59.7	59.8	60.5	57.8	57.9	58.3	58.8	57.8
65.5°	53.0	53.3	54.8	56.2	56.1	56.8	54.3	54.4	54.4	55.5	54.7
66°	50.2	50.6	52.0	53.0	52.7	53.4	51.1	51.2	50.7	52.3	51.9



TEST NUMBER: P775636

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMW-1000lm-3000K

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
67.5°	43.6	44.1	44.7	45.0	44.4	45.1	43.4	43.8	42.7	44.6	44.9
68°	41.8	42.4	42.8	43.0	42.4	43.0	41.5	42.0	40.9	42.8	43.1
68.5°	40.2	40.9	41.1	41.1	40.6	41.1	40.1	40.4	39.9	41.1	41.4
69°	39.1	39.7	39.6	39.6	39.3	39.7	39.0	39.2	39.2	39.9	40.1
69.5°	38.4	38.6	38.5	38.4	38.2	38.5	38.2	38.4	38.5	38.9	39.2
70°	37.7	37.7	37.7	37.6	37.5	37.8	37.6	37.7	37.8	38.2	38.5
70.5°	37.0	37.1	37.3	37.0	36.8	37.2	37.0	37.0	37.1	37.5	37.9
71°	36.2	36.3	36.5	36.2	36.1	36.4	36.2	36.1	36.2	36.7	37.3
71.5°	35.6	35.6	35.9	35.6	35.5	35.8	35.5	35.4	35.5	35.9	36.5
72°	34.9	34.9	35.2	35.0	34.8	35.1	34.8	34.6	34.6	35.1	35.8
72.5°	34.3	34.3	34.5	34.4	34.1	34.4	34.1	33.8	33.8	34.3	35.1
73°	33.5	33.5	33.8	33.7	33.4	33.7	33.3	32.9	32.9	33.5	34.3
73.5°	32.7	32.7	33.1	32.9	32.7	32.9	32.5	31.9	31.9	32.6	33.5
74°	31.7	31.8	32.3	32.2	31.8	32.2	31.6	31.0	31.0	31.6	32.7
74.5°	30.8	30.9	31.4	31.4	31.0	31.3	30.8	30.1	30.0	30.7	31.8
75°	30.0	30.0	30.6	30.6	30.2	30.5	29.9	29.1	29.0	29.7	30.9
75.5°	29.0	29.1	29.8	29.8	29.4	29.7	29.0	28.1	28.0	28.7	30.0
76°	28.0	28.1	28.9	29.0	28.6	28.9	28.1	27.0	26.8	27.7	29.1
76.5°	27.0	27.2	28.0	28.1	27.7	28.0	27.0	26.0	25.8	26.5	28.2
77°	25.9	26.1	27.0	27.3	26.7	27.0	26.1	24.9	24.6	25.4	27.3
77.5°	24.8	25.0	26.1	26.3	25.8	26.1	25.1	23.8	23.4	24.2	26.1
78°	23.7	24.0	25.1	25.4	24.9	25.2	24.0	22.6	22.1	23.1	25.1
78.5°	22.6	22.9	24.1	24.5	23.9	24.2	23.0	21.3	20.9	21.8	24.0
79°	21.3	21.6	23.1	23.5	23.0	23.2	21.8	20.1	19.7	20.6	23.0
79.5°	20.1	20.5	22.0	22.5	21.9	22.3	20.7	18.9	18.4	19.3	21.8
80°	18.8	19.2	20.9	21.4	20.9	21.1	19.6	17.7	17.0	18.0	20.6
80.5°	17.6	18.0	19.8	20.4	19.8	20.1	18.5	16.3	15.7	16.7	19.5
81°	16.3	16.7	18.7	19.4	18.8	19.0	17.4	15.0	14.3	15.3	18.3
81.5°	14.9	15.4	17.6	18.3	17.7	17.9	16.1	13.7	13.0	14.0	17.0
82°	13.6	14.1	16.3	17.1	16.5	16.8	15.0	12.4	11.5	12.7	15.9
82.5°	12.2	12.8	15.2	16.0	15.4	15.6	13.9	11.1	10.2	11.2	14.7
83°	10.8	11.4	14.1	14.9	14.3	14.5	12.8	10.0	8.8	10.1	13.6
83.5°	9.4	10.1	13.0	13.8	13.2	13.4	11.6	8.9	7.5	9.0	12.4
84°	8.0	8.8	11.8	12.7	12.0	12.2	10.5	7.8	6.0	7.9	11.3
84.5°	6.5	7.6	10.7	11.4	10.8	11.0	9.4	6.7	4.6	6.6	10.2
85°	5.2	6.5	9.7	10.3	9.6	9.8	8.3	5.6	3.7	5.5	9.1
85.5°	4.0	5.7	8.6	9.1	8.4	8.6	7.0	4.8	3.2	4.9	8.1
86°	3.5	5.0	7.5	7.9	7.1	7.3	5.9	4.1	2.8	4.2	6.9
86.5°	3.0	4.2	6.2	6.6	5.9	6.1	4.8	3.4	2.2	3.6	5.8
87°	2.4	3.5	5.1	5.3	4.7	4.8	3.7	2.6	1.8	2.9	4.7
87.5°	1.8	2.8	3.9	4.1	3.5	3.6	2.4	1.8	1.3	2.2	3.6
88°	1.3	2.0	3.0	3.1	2.2	2.4	1.4	1.1	0.8	1.5	2.4
88.5°	0.9	1.3	2.0	2.0	1.2	1.3	0.5	0.5	0.5	0.9	1.4



TEST NUMBER: P775636
CATALOG NUMBER: HCDJBL510CSD-HCD41TRMW-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	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0



TEST NUMBER: P775636

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMW-1000lm-3000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
0°	576.7	576.7	576.7	576.7	576.7	576.7
0.5°	576.4	576.7	576.7	576.6	576.5	576.6
1°	576.2	576.5	576.3	576.4	576.3	576.4
1.5°	576.0	576.2	576.0	576.0	576.0	576.1
2°	575.6	575.8	575.6	575.7	575.6	575.8
2.5°	575.3	575.4	575.2	575.3	575.2	575.4
3°	574.9	574.9	574.6	574.8	574.7	575.0
3.5°	574.4	574.4	574.1	574.3	574.3	574.6
4°	573.9	573.9	573.3	573.7	573.7	574.1
4.5°	573.2	573.1	572.7	573.0	573.0	573.4
5°	572.5	572.4	572.0	572.3	572.3	572.8
5.5°	571.8	571.7	571.2	571.5	571.6	572.1
6°	571.1	570.9	570.3	570.8	570.8	571.3
6.5°	570.3	570.1	569.4	569.9	570.0	570.5
7°	569.5	569.2	568.4	569.0	569.1	569.7
7.5°	568.4	568.1	567.4	567.9	568.0	568.8
8°	567.5	567.1	566.3	566.9	567.1	567.8
8.5°	566.4	565.9	565.3	565.9	566.0	566.8
9°	565.4	564.8	564.1	564.8	565.0	565.7
9.5°	564.2	563.5	562.8	563.5	563.7	564.6
10°	562.9	562.3	561.5	562.2	562.5	563.3
10.5°	561.7	561.0	560.1	561.0	561.3	562.1
11°	560.3	559.7	558.6	559.6	560.0	560.8
11.5°	559.0	558.2	557.2	558.1	558.5	559.5
12°	557.5	556.7	555.7	556.7	557.0	558.0
12.5°	556.0	555.1	554.1	555.2	555.6	556.5
13°	554.5	553.5	552.4	553.5	554.0	555.1
13.5°	552.7	551.8	550.8	551.9	552.3	553.3
14°	551.1	550.2	549.1	550.3	550.6	551.8
14.5°	549.4	548.3	547.2	548.4	548.8	550.1
15°	547.5	546.5	545.3	546.7	547.1	548.3
15.5°	545.7	544.7	543.4	544.8	545.2	546.5
16°	543.7	542.6	541.4	542.8	543.2	544.6
16.5°	541.8	540.7	539.4	540.8	541.3	542.6
17°	539.8	538.5	537.2	538.7	539.3	540.7
17.5°	537.6	536.4	535.1	536.6	537.1	538.6
18°	535.5	534.1	532.7	534.5	535.0	536.5
18.5°	533.2	531.9	530.5	532.2	532.7	534.3
19°	531.0	529.6	528.1	529.9	530.4	532.0
19.5°	528.6	527.2	525.7	527.5	528.0	529.7
20°	526.3	524.8	523.2	525.1	525.7	527.3
20.5°	523.7	522.2	520.6	522.5	523.3	525.0
21°	521.2	519.6	517.9	520.1	520.8	522.3

TEST NUMBER: P775636

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMW-1000lm-3000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
22.5°	513.3	511.6	509.8	512.0	512.8	514.6
23°	510.6	508.8	506.9	509.2	510.1	511.8
23.5°	507.8	506.1	504.0	506.4	507.2	509.0
24°	505.0	503.0	501.1	503.4	504.2	506.2
24.5°	502.0	500.1	498.1	500.6	501.4	503.3
25°	499.0	497.0	495.1	497.5	498.4	500.4
25.5°	496.0	493.9	491.8	494.4	495.4	497.4
26°	492.9	490.8	488.7	491.4	492.3	494.2
26.5°	489.7	487.7	485.6	488.1	489.1	491.3
27°	486.6	484.4	482.2	484.9	486.0	488.1
27.5°	483.4	481.2	478.9	481.7	482.7	484.8
28°	480.2	477.7	475.6	478.3	479.3	481.6
28.5°	476.8	474.4	472.1	474.8	476.1	478.2
29°	473.4	471.1	468.7	471.4	472.6	474.9
29.5°	469.9	467.6	465.0	468.0	469.1	471.5
30°	466.6	464.0	461.7	464.4	465.7	468.0
30.5°	463.0	460.5	458.0	460.9	462.1	464.4
31°	459.5	456.9	454.4	457.4	458.5	460.9
31.5°	456.0	453.3	450.6	453.6	454.8	457.3
32°	452.3	449.5	447.0	449.9	451.2	453.7
32.5°	448.6	445.9	443.2	446.2	447.5	449.9
33°	444.8	442.1	439.4	442.4	443.7	446.3
33.5°	441.1	438.2	435.4	438.6	439.9	442.5
34°	437.1	434.3	431.5	434.6	436.0	438.5
34.5°	433.1	430.2	427.5	430.6	432.0	434.6
35°	429.1	426.2	423.3	426.5	427.9	430.4
35.5°	424.9	422.0	419.0	422.3	423.7	426.4
36°	420.6	417.7	414.7	418.2	419.5	422.2
36.5°	416.3	413.3	410.3	413.7	415.0	417.8
37°	411.7	408.7	405.7	409.2	410.5	413.3
37.5°	406.5	403.8	400.8	404.6	405.9	408.5
38°	400.6	398.4	395.2	399.8	400.9	403.5
38.5°	394.7	392.6	389.1	394.2	395.0	397.9
39°	388.5	386.2	383.1	388.0	389.1	392.0
39.5°	382.1	379.3	376.5	381.5	382.8	385.4
40°	375.4	372.2	369.5	374.8	376.1	378.4
40.5°	368.7	365.0	362.5	367.9	369.0	371.1
41°	361.7	357.8	355.1	360.8	361.8	363.8
41.5°	354.6	350.3	347.7	353.8	354.4	356.4
42°	347.4	343.2	340.2	346.4	346.8	348.7
42.5°	340.1	336.0	332.5	339.1	339.2	341.2
43°	332.8	328.8	324.8	331.6	331.6	333.7
43.5°	325.5	321.3	316.9	324.0	323.8	326.1



TEST NUMBER: P775636

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMW-1000lm-3000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
45°	303.5	299.2	294.0	300.5	300.2	303.2
45.5°	296.1	291.7	286.3	292.5	292.2	295.5
46°	288.8	284.5	278.8	284.6	284.4	287.9
46.5°	281.4	276.8	271.1	276.8	276.5	280.3
47°	273.8	269.3	263.7	268.7	268.7	272.4
47.5°	266.4	261.8	256.0	260.7	260.9	264.8
48°	259.0	254.4	248.5	252.5	253.2	257.1
48.5°	251.4	246.8	240.9	244.9	245.6	249.5
49°	243.8	239.6	233.7	236.8	238.0	241.9
49.5°	236.2	232.3	226.5	229.2	230.5	234.4
50°	228.6	225.0	219.0	221.3	223.0	226.9
50.5°	221.2	217.7	211.8	213.8	215.6	219.5
51°	213.8	210.8	204.7	206.3	208.1	212.0
51.5°	206.4	203.6	197.6	199.0	200.8	204.9
52°	199.0	196.7	190.6	191.8	193.6	197.6
52.5°	191.8	189.8	183.5	185.0	186.6	190.6
53°	184.7	182.9	176.7	177.9	179.6	183.5
53.5°	177.6	176.2	170.1	171.1	172.7	176.6
54°	170.6	169.3	163.3	164.5	165.9	169.7
54.5°	163.7	162.8	156.9	158.1	159.2	163.0
55°	157.0	156.4	150.6	151.7	152.9	156.4
55.5°	150.4	149.9	144.3	145.7	146.6	149.9
56°	143.8	143.5	138.1	139.6	140.2	143.6
56.5°	137.5	137.4	132.2	133.8	134.2	137.3
57°	131.2	131.3	126.4	128.1	128.4	131.2
57.5°	125.0	125.3	120.7	122.5	122.7	125.1
58°	119.2	119.5	115.2	117.3	117.1	119.2
58.5°	113.4	113.9	109.9	112.1	111.9	113.5
59°	107.8	108.3	104.7	107.0	106.6	108.0
59.5°	102.3	102.9	99.8	102.1	101.7	102.6
60°	97.1	97.7	94.9	97.5	96.8	97.3
60.5°	92.5	92.6	90.2	92.9	92.2	92.3
61°	87.8	87.7	85.7	88.5	87.6	87.3
61.5°	83.1	83.0	81.6	84.2	83.3	82.6
62°	78.5	78.4	77.5	80.2	79.1	78.1
62.5°	73.8	74.1	73.5	76.4	75.1	73.8
63°	69.8	70.0	69.7	72.6	71.2	69.7
63.5°	66.1	66.0	66.1	69.0	67.7	65.9
64°	62.5	62.4	62.8	65.5	64.2	62.3
64.5°	59.1	59.0	59.6	62.3	60.9	58.8
65°	56.0	55.9	56.5	59.1	57.7	55.8
65.5°	53.2	53.2	53.7	56.2	55.0	53.0
66°	50.5	50.6	51.1	53.5	52.3	50.2



TEST NUMBER: P775636

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMW-1000lm-3000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
67.5°	44.3	44.7	44.6	46.3	45.4	43.6
68°	42.8	43.1	43.0	44.4	43.5	41.8
68.5°	41.3	41.6	41.4	42.7	41.8	40.2
69°	40.1	40.4	40.1	41.0	40.4	39.1
69.5°	39.1	39.3	39.0	39.7	39.2	38.4
70°	38.5	38.5	38.2	38.7	38.3	37.7
70.5°	37.9	37.9	37.6	38.0	37.5	37.0
71°	37.2	37.2	37.0	37.4	36.7	36.2
71.5°	36.5	36.5	36.3	36.6	36.1	35.6
72°	35.8	35.8	35.6	36.0	35.4	34.9
72.5°	35.1	35.2	34.9	35.3	34.7	34.3
73°	34.4	34.6	34.3	34.7	34.0	33.5
73.5°	33.7	33.9	33.6	34.1	33.2	32.7
74°	33.0	33.2	33.0	33.3	32.4	31.7
74.5°	32.2	32.5	32.2	32.5	31.4	30.8
75°	31.3	31.6	31.3	31.7	30.6	30.0
75.5°	30.5	30.8	30.5	30.8	29.6	29.0
76°	29.7	30.0	29.7	30.0	28.7	28.0
76.5°	28.8	29.1	28.9	29.1	27.7	27.0
77°	27.9	28.3	28.0	28.2	26.6	25.9
77.5°	26.9	27.4	27.2	27.3	25.6	24.8
78°	26.0	26.4	26.2	26.3	24.5	23.7
78.5°	25.0	25.5	25.2	25.3	23.4	22.6
79°	24.0	24.5	24.3	24.3	22.3	21.3
79.5°	23.0	23.5	23.3	23.2	21.0	20.1
80°	21.9	22.5	22.1	22.1	19.8	18.8
80.5°	20.8	21.3	21.1	21.0	18.6	17.6
81°	19.8	20.3	20.1	19.9	17.4	16.3
81.5°	18.7	19.2	19.0	18.8	16.0	14.9
82°	17.5	18.1	17.9	17.6	14.7	13.6
82.5°	16.3	16.9	16.7	16.4	13.4	12.2
83°	15.2	15.7	15.5	15.3	12.1	10.8
83.5°	14.0	14.6	14.4	14.2	10.8	9.4
84°	12.8	13.4	13.3	13.0	9.5	8.0
84.5°	11.5	12.1	12.0	11.8	8.3	6.5
85°	10.3	10.9	10.8	10.8	7.1	5.2
85.5°	9.1	9.7	9.6	9.7	6.2	4.0
86°	7.8	8.5	8.4	8.6	5.4	3.5
86.5°	6.5	7.1	7.0	7.5	4.7	3.0
87°	5.3	5.9	5.8	6.2	3.9	2.4
87.5°	4.0	4.6	4.5	5.1	3.2	1.8
88°	2.8	3.4	3.3	3.9	2.4	1.3
88.5°	1.6	2.6	2.4	3.0	1.7	0.9



TEST NUMBER: P775636
CATALOG NUMBER: HCDJBL510CSD-HCD41TRMW-1000lm-3000K

CANDELA DISTRIBUTION (continued):

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



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

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21.5°	519.9	522.5	525.9	529.1	531.5	533.1	531.3	530.7	529.1	526.3	522.5
22°	517.2	520.1	523.4	526.7	529.0	530.8	528.8	528.3	526.8	523.8	520.0



44°	318.5	325.4	334.4	342.4	344.4	348.2	341.3	340.1	337.1	334.6	327.7
44.5°	310.7	317.9	326.7	334.5	336.3	340.8	333.9	332.6	329.2	326.8	320.1



66.5°	47.8	48.2	49.3	50.1	49.5	50.3	48.2	48.5	47.7	49.4	49.3
67°	45.6	45.9	46.9	47.4	46.7	47.6	45.6	45.9	44.9	46.9	47.0



89°	0.5	0.6	1.0	1.1	0.2	0.3	0.0	0.1	0.1	0.3	0.6
89.5°	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0

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21.5°	518.6	517.0	515.3	517.4	518.1	519.9
22°	516.1	514.3	512.6	514.8	515.5	517.2



44°	318.1	313.9	309.3	316.2	315.8	318.5
44.5°	310.8	306.5	301.5	308.4	308.0	310.7

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66.5°	48.3	48.5	48.8	50.9	49.7	47.8
67°	46.1	46.3	46.5	48.6	47.5	45.6

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89°	0.7	1.7	1.6	2.0	1.0	0.5
89.5°	0.0	0.9	0.9	1.1	0.4	0.1

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(END OF REPORT)