

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: P775678

Luminaire Tested: HCDJBL510CSD-HCD4TRH-HCD4TRLWW-1000lm-4000K

Issue Date: 2/7/2024

Test Information

Test Method: LM-79-2019
Report Number: P775678
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (A2312156B004)
Test Lab:
Issue Date: 2/7/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO COMMERCIAL
Catalog Number: HCDJBL510CSD-HCD4TRH-HCD4TRLWW-1000lm-4000K
Description: 4 INCH ROUND MEDIUM LENSED WALLWASH KIT
Light Source: SELECTABLE LUMENS AND CCT ARRAY 90CRI / 4000K CCT
Ballast/Driver: -

Summary

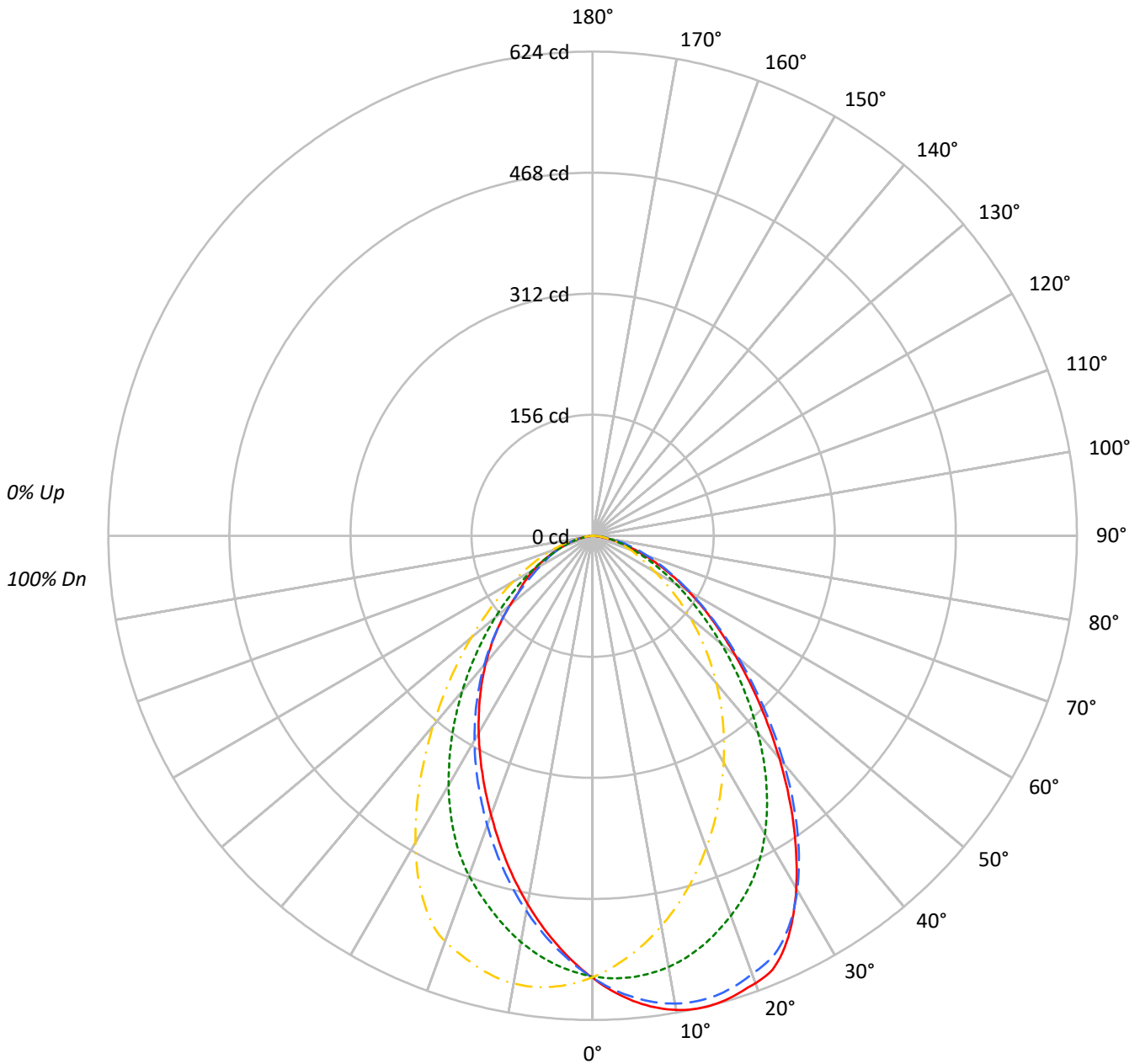
Lumens per Lamp: N/A
Luminaire Lumens: 1068.6 lumens
Efficiency: N/A
Efficacy: 106.9 lumens/watt
Spacing Criteria (0/90/45): 1.1 / 1.09 / 1.15
Luminous Opening: Circular (Dia: 0.33' x H: 0')
CIE Type: Direct

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	111	107	103	100	108	104	101	98	100	98	95	96	94	92	93	91	90	88								
2	102	95	89	84	100	93	88	83	90	85	82	87	83	80	84	81	78	76								
3	94	85	78	73	92	84	77	72	81	75	71	78	73	69	76	72	68	66								
4	87	77	69	63	85	76	68	63	73	67	62	71	66	61	69	64	60	58								
5	81	70	62	56	79	69	61	55	67	60	55	65	59	54	63	58	54	52								
6	75	63	55	50	74	63	55	49	61	54	49	59	53	49	58	52	48	46								
7	70	58	50	45	69	57	50	44	56	49	44	54	48	44	53	48	44	42								
8	66	54	46	40	64	53	45	40	52	45	40	50	44	40	49	44	40	38								
9	62	49	42	37	61	49	42	37	48	41	37	47	41	36	46	40	36	35								
10	58	46	39	34	57	45	38	34	45	38	34	44	38	33	43	37	33	32								

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°	270°
0°	71634	71634	71634	71634
5°	76038	72147	66816	70038
10°	79307	72100	61608	67934
15°	81248	71268	56324	65223
20°	82191	69762	51240	62410
25°	81275	67847	46740	58710
30°	76292	64551	42651	53913
35°	69243	59948	38854	48533
40°	61508	54461	35141	42944
45°	53874	48464	31271	37340
50°	46969	42290	27077	32050
55°	41074	36401	24179	27229
60°	35842	31009	21898	22779
65°	30374	26265	18850	18701
70°	24984	22004	15491	15086
75°	19207	18380	12545	11864
80°	12248	15292	8914	8769
85°	3610	13284	3466	4043

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 22.5°

Vertical Angle: 45°

Luminance: 55707 cd/sqm



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	53.4	5.0
10°-20°	148.0	13.8
20°-30°	209.7	19.6
30°-40°	219.1	20.5
40°-50°	184.4	17.3
50°-60°	130.9	12.3
60°-70°	79.4	7.4
70°-80°	36.4	3.4
80°-90°	7.3	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°	411.1	38.5
0°-40°	630.1	59.0
0°-60°	945.5	88.5
0°-90°	1068.6	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1068.6	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	569	569	569	569	569	
5°	602	571	529	554	602	58
15°	624	547	432	501	624	176
25°	585	489	337	423	585	267
35°	451	390	253	316	451	281
45°	303	272	176	210	303	234
55°	187	166	110	124	187	168
65°	102	88	63	63	102	102
75°	40	38	26	24	40	43
85°	2	9	2	3	2	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°	569.2	569.2	569.2	569.2	569.2	569.2	569.2	569.2	569.2	569.2	569.2
0.5°	573.6	573.6	573.0	571.7	568.7	567.5	566.8	566.3	566.3	566.2	566.6
1°	577.3	577.2	575.9	573.7	569.3	566.8	564.7	563.0	562.4	562.2	563.2
1.5°	580.8	580.8	579.0	575.7	569.9	565.8	562.3	559.6	558.5	558.3	559.7
2°	584.1	584.1	581.9	577.5	570.5	564.9	559.9	556.2	554.4	554.2	556.2
2.5°	587.4	587.5	584.6	579.3	570.9	563.7	557.4	552.6	550.3	550.1	552.5
3°	590.4	590.6	587.4	580.9	571.1	562.6	554.9	549.0	546.2	545.9	548.9
3.5°	593.5	593.7	589.9	582.3	571.3	561.2	552.2	545.4	542.0	541.6	545.2
4°	596.4	596.7	592.3	583.8	571.3	559.9	549.4	541.6	537.6	537.3	541.4
4.5°	599.2	599.6	594.6	585.2	571.3	558.3	546.6	537.7	533.2	533.1	537.5
5°	601.9	602.3	596.8	586.3	571.1	556.7	543.7	533.8	528.9	528.5	533.6
5.5°	604.3	604.9	598.9	587.4	571.0	555.0	540.7	529.8	524.3	523.9	529.6
6°	606.7	607.5	600.9	588.4	570.6	553.2	537.6	525.8	519.8	519.4	525.5
6.5°	608.9	609.8	602.7	589.3	570.1	551.4	534.5	521.8	515.3	514.9	521.4
7°	611.0	612.0	604.5	590.0	569.6	549.4	531.4	517.6	510.6	510.4	517.3
7.5°	613.0	614.1	606.1	590.6	568.9	547.3	528.0	513.4	505.9	505.6	513.0
8°	614.8	616.0	607.6	591.1	568.2	545.2	524.7	509.2	501.2	500.9	508.7
8.5°	616.4	617.7	608.9	591.5	567.3	542.9	521.2	504.9	496.5	496.2	504.4
9°	618.0	619.4	610.2	591.8	566.4	540.7	517.8	500.6	491.7	491.3	500.1
9.5°	619.3	620.9	611.2	592.0	565.3	538.3	514.1	496.2	486.8	486.6	495.6
10°	620.6	622.3	612.2	592.0	564.2	535.8	510.6	491.8	482.1	481.7	491.1
10.5°	621.6	623.4	612.9	591.9	562.9	533.2	506.8	487.3	477.2	476.7	486.6
11°	622.5	624.5	613.7	591.8	561.5	530.5	503.3	482.7	472.2	471.9	482.1
11.5°	623.2	625.3	614.1	591.4	560.1	527.9	499.3	478.2	467.4	467.1	477.6
12°	623.7	626.0	614.5	591.0	558.5	525.1	495.4	473.6	462.3	462.0	473.0
12.5°	624.2	626.6	614.7	590.4	556.8	522.2	491.4	469.1	457.4	457.1	468.2
13°	624.4	627.0	614.8	589.7	555.0	519.3	487.7	464.3	452.5	452.0	463.7
13.5°	624.5	627.2	614.7	588.9	553.1	516.2	483.7	459.8	447.4	447.1	459.0
14°	624.3	627.3	614.5	587.9	551.2	513.1	479.6	455.0	442.4	442.0	454.2
14.5°	624.1	627.2	614.1	586.9	549.0	509.9	475.5	450.3	437.4	436.9	449.5
15°	623.6	626.9	613.5	585.6	547.0	506.8	471.3	445.4	432.3	432.0	444.7
15.5°	623.0	626.5	612.9	584.3	544.7	503.4	467.2	440.7	427.2	426.9	440.0
16°	622.4	625.8	612.1	582.9	542.3	500.1	463.0	436.0	422.2	421.8	435.2
16.5°	621.4	625.1	611.1	581.3	539.9	496.6	458.7	431.2	417.3	416.7	430.5
17°	620.5	624.3	610.0	579.6	537.4	493.2	454.5	426.4	412.1	411.7	425.7
17.5°	619.3	623.3	608.8	577.8	534.6	489.6	450.0	421.6	407.1	406.8	420.9
18°	618.2	622.2	607.5	575.9	532.0	486.0	445.7	416.7	402.1	401.6	416.1
18.5°	616.8	620.9	606.0	573.9	529.3	482.3	441.3	411.8	397.2	396.7	411.3
19°	615.6	619.5	604.4	571.9	526.5	478.7	437.1	407.0	392.3	391.6	406.5
19.5°	614.7	618.3	602.8	569.7	523.7	475.1	432.5	402.2	387.5	386.8	401.7
20°	613.7	617.2	601.1	567.5	520.9	471.4	428.1	397.4	382.6	381.9	397.0
20.5°	612.5	616.1	599.6	565.4	517.9	467.6	423.7	392.6	378.0	377.1	392.1
21°	611.1	614.8	598.1	563.3	515.0	463.8	419.3	387.9	373.1	372.3	387.4



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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°	605.3	609.9	592.6	556.4	505.8	452.4	405.7	374.0	359.3	358.2	373.2
23°	602.1	607.5	590.4	553.9	502.6	448.5	401.3	369.5	354.5	353.6	368.5
23.5°	598.4	604.6	588.0	551.1	499.2	444.5	396.7	364.8	350.1	349.2	363.9
24°	594.5	601.1	584.9	548.1	495.8	440.5	392.1	360.3	345.6	344.4	359.2
24.5°	590.2	597.2	581.4	544.9	492.2	436.3	387.5	355.9	341.1	339.8	354.5
25°	585.3	593.2	577.7	541.4	488.6	432.1	383.1	351.3	336.6	335.4	349.9
25.5°	580.2	589.0	573.7	537.6	484.6	427.9	378.6	347.0	332.3	331.0	345.3
26°	575.2	584.2	569.5	533.6	480.7	423.6	374.1	342.4	327.8	326.6	340.7
26.5°	569.6	579.0	565.1	529.3	476.4	419.2	369.3	338.1	323.4	322.1	336.0
27°	563.7	573.9	560.5	524.8	472.2	414.8	364.8	333.6	319.0	317.8	331.4
27.5°	557.5	568.5	555.4	520.1	467.7	410.3	360.3	329.3	314.8	313.4	327.0
28°	551.7	562.6	550.2	515.2	463.3	405.8	355.8	324.9	310.4	309.1	322.4
28.5°	545.0	556.6	544.8	510.3	458.6	401.3	351.2	320.7	306.3	304.8	317.9
29°	538.4	550.5	539.3	505.0	453.8	396.6	346.6	316.4	302.0	300.5	313.3
29.5°	531.7	544.1	533.4	499.7	448.9	392.0	342.2	312.1	297.7	296.3	308.8
30°	525.0	537.6	527.4	494.3	444.2	387.2	337.6	307.9	293.5	292.1	304.4
30.5°	517.7	530.8	521.2	488.6	439.0	382.4	333.1	303.7	289.4	287.9	299.9
31°	510.6	523.9	514.8	482.9	433.9	377.6	328.6	299.4	285.2	283.7	295.4
31.5°	503.3	516.8	508.3	476.9	428.6	372.7	324.1	295.1	281.2	279.4	290.9
32°	496.0	509.7	501.6	471.0	423.5	367.9	319.5	290.9	277.0	275.3	286.5
32.5°	488.5	502.5	494.7	465.0	418.0	363.0	315.1	286.8	273.0	271.2	282.0
33°	481.1	495.1	487.9	458.9	412.5	358.0	310.5	282.6	268.9	267.1	277.6
33.5°	473.7	487.6	480.8	452.5	407.1	353.1	306.1	278.5	264.9	263.0	273.1
34°	466.1	480.2	473.7	446.1	401.5	348.0	301.5	274.4	260.9	258.9	268.8
34.5°	458.2	472.3	466.1	439.6	395.8	343.0	297.1	270.2	256.9	254.8	264.4
35°	450.7	464.8	458.9	433.0	390.2	337.9	292.5	266.1	252.9	250.8	260.0
35.5°	443.1	457.0	451.5	426.4	384.5	333.0	288.1	262.0	249.1	246.8	255.7
36°	435.5	449.5	444.1	419.7	378.7	327.9	283.6	258.0	245.0	242.7	251.4
36.5°	427.8	441.7	436.5	413.0	372.9	322.7	279.2	253.9	241.3	238.7	247.0
37°	419.9	433.8	429.1	406.1	367.0	317.6	274.7	249.8	237.2	234.7	242.7
37.5°	412.4	426.0	421.6	399.3	361.2	312.7	270.3	245.8	233.4	230.7	238.5
38°	404.8	418.2	414.0	392.4	355.3	307.5	265.7	241.8	229.4	226.9	234.2
38.5°	397.1	410.3	406.2	385.4	349.4	302.4	261.5	237.8	225.5	222.9	229.9
39°	389.3	402.8	398.9	378.5	343.5	297.3	257.0	233.7	221.7	219.0	225.8
39.5°	382.0	395.0	391.2	371.6	337.5	292.2	252.7	229.7	217.9	215.0	221.5
40°	374.4	387.1	383.7	364.6	331.5	287.0	248.3	225.7	213.9	211.1	217.4
40.5°	366.7	379.3	376.1	357.7	325.5	281.9	243.9	221.6	210.0	207.1	213.1
41°	359.3	371.9	368.8	350.6	319.5	276.8	239.6	217.7	206.3	203.1	209.1
41.5°	352.0	364.3	361.3	343.8	313.8	271.7	235.3	213.7	202.5	199.2	204.9
42°	344.8	356.6	354.0	337.0	307.7	266.6	230.9	209.7	198.6	195.4	200.8
42.5°	337.4	349.1	346.6	330.0	301.8	261.6	226.5	205.8	194.7	191.6	196.8
43°	330.4	341.9	339.3	323.4	295.9	256.6	222.3	202.0	190.9	187.7	192.7
43.5°	323.4	334.6	332.0	316.5	289.9	251.6	217.9	198.0	187.1	183.8	188.5



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
45°	302.7	313.0	310.9	296.6	272.3	236.5	205.3	186.2	175.7	172.3	176.6
45.5°	296.1	306.1	304.0	289.9	266.5	231.6	201.0	182.2	172.0	168.5	172.6
46°	289.4	299.2	297.2	283.5	260.7	226.7	196.8	178.4	168.2	164.8	168.6
46.5°	282.7	292.4	290.5	277.1	255.0	221.8	192.6	174.5	164.4	160.9	164.8
47°	276.5	285.8	283.7	270.8	249.1	216.9	188.4	170.6	160.7	157.2	161.1
47.5°	270.2	279.1	277.1	264.4	243.5	212.0	184.3	166.9	156.8	153.4	157.0
48°	263.7	272.5	270.7	258.2	237.9	207.3	180.1	163.1	153.2	149.7	153.2
48.5°	257.6	266.4	264.4	252.2	232.4	202.6	176.1	159.2	149.4	146.0	149.4
49°	251.9	260.1	258.2	246.2	226.9	197.8	172.0	155.5	145.6	142.4	145.8
49.5°	245.9	253.8	252.0	240.2	221.4	193.2	167.9	151.7	142.0	138.7	142.0
50°	239.9	247.7	245.8	234.4	216.0	188.5	163.9	147.9	138.3	135.1	138.4
50.5°	234.4	241.9	239.8	228.4	210.7	183.9	159.9	144.2	134.5	131.6	134.7
51°	228.8	236.1	233.8	222.9	205.5	179.4	155.9	140.5	130.9	127.9	131.1
51.5°	223.1	230.1	228.1	217.2	200.4	174.8	152.0	136.8	127.5	124.5	127.6
52°	217.8	224.7	222.6	211.7	195.1	170.4	148.2	133.2	123.8	121.2	124.1
52.5°	212.7	219.3	216.9	206.4	190.1	165.9	144.3	129.6	120.5	117.7	120.5
53°	207.2	213.6	211.4	200.9	185.1	161.6	140.5	126.0	118.7	114.3	117.2
53.5°	202.0	208.4	206.1	195.7	180.2	157.3	136.6	122.5	116.8	111.2	113.8
54°	197.2	203.2	200.7	190.5	175.3	153.0	132.9	119.1	114.7	109.3	110.5
54.5°	192.3	198.2	195.5	185.5	170.5	148.8	129.2	115.7	112.4	107.3	107.3
55°	187.2	193.1	190.5	180.4	165.9	144.7	125.7	112.4	110.2	105.2	104.1
55.5°	182.8	188.2	185.6	175.6	161.3	140.6	122.1	109.1	107.8	103.0	101.1
56°	178.1	183.4	180.6	170.6	156.7	136.6	118.5	106.7	105.5	100.8	98.0
56.5°	173.4	178.6	175.9	166.0	152.2	132.6	115.0	104.8	103.2	98.5	95.1
57°	168.9	173.9	171.2	161.4	147.8	128.7	111.6	102.7	100.8	96.3	92.3
57.5°	164.4	169.5	166.5	156.9	143.5	124.8	108.2	100.6	98.5	94.0	89.7
58°	159.7	165.0	162.0	152.4	139.3	121.2	105.0	98.4	96.3	91.8	87.2
58.5°	155.4	160.5	157.6	148.1	135.1	117.5	101.8	96.1	93.9	89.6	84.7
59°	150.9	156.1	153.2	143.7	131.0	113.8	98.7	93.8	91.6	87.5	82.2
59.5°	146.5	151.7	149.0	139.5	127.0	110.2	95.5	91.6	89.3	85.4	79.6
60°	142.4	147.4	144.8	135.3	123.2	106.8	92.5	89.5	87.0	83.2	77.8
60.5°	137.8	143.2	140.7	131.3	119.3	103.4	89.7	87.3	84.7	81.1	75.9
61°	133.8	138.7	136.5	127.4	115.6	100.0	87.0	85.1	82.4	78.9	74.0
61.5°	129.6	134.8	132.7	123.6	111.8	96.7	84.3	83.0	80.1	76.8	72.1
62°	125.6	130.7	128.8	119.7	108.2	93.6	81.5	80.8	77.7	74.7	70.2
62.5°	121.5	126.6	124.9	116.0	104.7	90.6	78.8	78.5	75.2	72.5	68.3
63°	117.4	122.7	121.2	112.2	101.2	87.6	76.2	76.3	72.8	70.3	66.4
63.5°	113.5	118.7	117.5	108.6	97.7	84.6	73.9	74.0	70.4	68.2	64.5
64°	109.5	115.0	113.9	105.1	94.4	81.6	71.7	71.8	68.0	66.0	62.8
64.5°	105.8	111.1	110.3	101.7	91.3	78.6	69.8	69.6	65.6	63.8	61.0
65°	102.0	107.5	106.9	98.4	88.2	76.0	68.0	67.5	63.3	61.7	59.3
65.5°	98.5	103.7	103.4	95.1	85.0	73.2	66.2	65.1	60.9	59.5	57.5
66°	94.7	100.2	100.0	91.8	82.0	70.4	64.3	63.0	58.6	57.4	55.8



TEST NUMBER: P775678

CATALOG NUMBER: HCDJBL510CSD-HCD4TRH-HCD4TRLWW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
67.5°	84.3	89.7	90.2	82.5	73.1	63.0	58.9	56.6	51.9	51.2	50.6
68°	80.8	86.4	87.0	79.5	70.2	60.6	57.2	54.5	49.8	49.1	49.0
68.5°	77.4	83.1	84.0	76.5	67.6	58.3	55.5	52.5	47.8	47.2	47.3
69°	74.3	79.9	80.9	73.7	64.9	56.1	53.7	50.4	45.8	45.2	45.6
69.5°	71.0	76.6	77.8	70.8	62.3	53.9	51.9	48.4	44.0	43.4	43.9
70°	67.9	73.6	74.9	68.2	59.8	51.8	50.2	46.4	42.1	41.6	42.2
70.5°	64.7	70.5	72.1	65.4	57.3	49.8	48.5	44.7	40.3	39.8	40.6
71°	61.7	67.5	69.2	62.8	55.0	47.8	46.9	42.8	38.7	38.1	39.0
71.5°	58.7	64.5	66.3	60.2	52.5	45.9	45.2	41.0	37.0	36.5	37.3
72°	55.9	61.6	63.7	57.7	50.3	44.0	43.5	39.3	35.3	34.8	35.7
72.5°	53.0	58.8	60.9	55.3	48.0	42.2	41.8	37.6	33.6	33.2	34.2
73°	50.1	56.1	58.3	52.7	45.9	40.6	40.2	35.9	32.0	31.6	32.6
73.5°	47.4	53.3	55.7	50.4	43.7	38.8	38.6	34.4	30.5	30.1	31.0
74°	44.7	50.8	53.2	48.2	41.7	37.1	37.0	32.8	28.9	28.5	29.5
74.5°	42.0	48.1	50.8	45.9	39.7	35.5	35.5	31.2	27.4	27.0	28.2
75°	39.5	45.6	48.2	43.7	37.8	33.9	33.8	29.7	25.8	25.4	26.7
75.5°	37.1	43.1	45.8	41.6	35.9	32.4	32.4	28.3	24.4	24.0	25.3
76°	34.7	40.8	43.5	39.5	34.2	30.9	30.8	26.7	23.0	22.5	24.0
76.5°	32.4	38.4	41.2	37.5	32.4	29.4	29.4	25.2	21.5	21.1	22.6
77°	29.9	36.1	39.0	35.6	30.7	28.1	28.0	23.9	20.2	19.6	21.2
77.5°	27.6	34.0	36.9	33.6	28.9	26.7	26.6	22.5	18.8	18.3	20.0
78°	25.4	31.8	34.9	31.7	27.3	25.3	25.1	21.0	17.4	16.9	18.6
78.5°	23.1	29.6	32.8	29.8	25.6	24.1	23.9	19.6	16.1	15.6	17.3
79°	21.0	27.5	30.7	28.1	24.2	22.9	22.5	18.3	14.8	14.3	16.1
79.5°	18.9	25.5	28.7	26.3	22.6	21.6	21.1	17.0	13.6	13.0	14.8
80°	16.9	23.5	26.7	24.6	21.1	20.5	19.9	15.7	12.3	11.8	13.7
80.5°	14.9	21.5	24.9	22.9	19.8	19.3	18.6	14.4	11.0	10.6	12.5
81°	13.0	19.8	23.1	21.3	18.4	18.2	17.3	13.1	9.9	9.6	11.5
81.5°	11.1	18.0	21.2	19.8	17.1	17.0	16.2	12.0	8.7	8.5	10.3
82°	9.2	16.3	19.5	18.3	15.9	15.9	14.9	10.7	7.6	7.5	9.4
82.5°	7.6	14.6	18.0	16.8	14.6	14.7	13.8	9.8	6.4	6.4	8.4
83°	5.9	13.0	16.4	15.4	13.4	13.7	12.6	8.7	5.3	5.4	7.5
83.5°	4.3	11.6	14.9	14.1	12.3	12.6	11.6	7.7	4.2	4.6	6.5
84°	3.8	10.2	13.4	12.7	11.2	11.5	10.5	6.7	3.4	4.0	5.6
84.5°	3.2	9.0	12.1	11.5	10.2	10.5	9.6	5.7	2.7	3.5	4.7
85°	2.5	8.0	10.7	10.2	9.2	9.5	8.5	5.0	2.4	2.9	3.9
85.5°	1.9	6.9	9.5	9.0	8.2	8.5	7.6	4.4	2.0	2.4	3.0
86°	1.4	6.0	8.2	7.9	7.3	7.5	6.6	3.8	1.7	1.9	2.3
86.5°	1.1	5.0	6.9	6.7	6.2	6.4	5.6	3.2	1.4	1.5	1.5
87°	0.7	4.1	5.8	5.7	5.3	5.5	4.7	2.6	1.1	0.9	0.7
87.5°	0.5	3.2	4.6	4.6	4.4	4.5	3.8	2.0	0.6	0.5	0.2
88°	0.2	2.3	3.6	3.7	3.6	3.7	2.9	1.5	0.3	0.2	0.1
88.5°	0.1	1.5	2.7	2.8	2.7	2.7	2.1	0.8	0.1	0.1	0.0



TEST NUMBER: P775678

CATALOG NUMBER: HCDJBL510CSD-HCD4TRH-HCD4TRLWW-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	0.3	0.5	0.4	0.2	0.1	0.0	0.1	0.0



TEST NUMBER: P775678

CATALOG NUMBER: HCDJBL510CSD-HCD4TRH-HCD4TRLWW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
0°	569.2	569.2	569.2	569.2	569.2	569.2
0.5°	567.3	566.9	568.8	570.8	572.5	573.6
1°	565.0	565.9	569.3	572.7	575.4	577.3
1.5°	562.6	564.9	569.6	574.4	578.2	580.8
2°	560.1	563.5	569.8	576.0	581.1	584.1
2.5°	557.4	562.4	570.0	577.6	583.6	587.4
3°	554.8	561.0	570.0	579.0	586.1	590.4
3.5°	552.0	559.5	570.0	580.3	588.5	593.5
4°	549.1	558.0	569.8	581.5	590.7	596.4
4.5°	546.3	556.2	569.5	582.5	593.0	599.2
5°	543.1	554.4	569.2	583.5	594.9	601.9
5.5°	540.1	552.6	568.7	584.3	596.9	604.3
6°	536.9	550.6	568.2	585.0	598.6	606.7
6.5°	533.8	548.5	567.3	585.6	600.3	608.9
7°	530.4	546.4	566.6	586.0	601.7	611.0
7.5°	527.1	544.1	565.6	586.3	603.0	613.0
8°	523.6	541.8	564.5	586.5	604.2	614.8
8.5°	520.0	539.3	563.3	586.5	605.2	616.4
9°	516.5	536.8	562.1	586.5	606.2	618.0
9.5°	512.9	534.2	560.7	586.3	606.9	619.3
10°	509.2	531.6	559.2	585.9	607.6	620.6
10.5°	505.4	528.7	557.6	585.5	608.1	621.6
11°	501.5	526.0	555.9	584.9	608.4	622.5
11.5°	497.6	523.0	554.0	584.1	608.5	623.2
12°	493.8	520.0	552.1	583.2	608.5	623.7
12.5°	489.8	516.9	550.0	582.1	608.3	624.2
13°	485.9	513.7	547.9	581.0	608.0	624.4
13.5°	481.9	510.5	545.7	579.7	607.5	624.5
14°	477.7	507.3	543.4	578.3	606.8	624.3
14.5°	473.5	504.0	540.9	576.9	606.1	624.1
15°	469.4	500.6	538.5	575.2	605.1	623.6
15.5°	465.3	497.2	536.0	573.4	604.1	623.0
16°	461.1	494.0	533.5	571.6	602.9	622.4
16.5°	456.9	490.5	530.8	569.8	601.7	621.4
17°	452.9	487.1	528.3	567.8	600.3	620.5
17.5°	448.6	483.8	525.8	565.8	598.8	619.3
18°	444.3	480.3	523.3	564.2	597.3	618.2
18.5°	440.0	476.8	520.6	562.4	596.0	616.8
19°	435.8	473.3	518.0	560.5	594.8	615.6
19.5°	431.6	469.8	515.1	558.4	593.6	614.7
20°	427.3	466.0	512.0	556.2	592.0	613.7
20.5°	423.0	462.2	509.0	553.9	590.3	612.5
21°	418.6	458.2	505.6	551.2	588.4	611.1

TEST NUMBER: P775678

CATALOG NUMBER: HCDJBL510CSD-HCD4TRH-HCD4TRLWW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
22.5°	405.3	445.9	494.1	540.8	580.1	605.3
23°	400.7	441.6	489.8	536.5	576.3	602.1
23.5°	396.1	437.1	485.1	532.1	572.3	598.4
24°	391.5	432.4	480.4	527.4	567.8	594.5
24.5°	387.0	427.7	475.3	522.2	563.2	590.2
25°	382.3	422.8	470.3	517.1	558.2	585.3
25.5°	377.5	417.9	465.2	511.9	552.7	580.2
26°	372.7	412.8	459.8	506.5	547.2	575.2
26.5°	367.9	407.9	454.4	500.7	541.6	569.6
27°	363.1	402.9	448.9	495.0	535.5	563.7
27.5°	358.2	397.6	443.3	488.9	529.1	557.5
28°	353.3	392.3	437.6	482.6	522.7	551.7
28.5°	348.3	387.2	431.9	476.4	516.2	545.0
29°	343.4	381.7	426.0	470.1	509.6	538.4
29.5°	338.5	376.5	420.2	463.4	502.7	531.7
30°	333.4	371.0	414.3	456.9	496.0	525.0
30.5°	328.4	365.7	408.1	450.0	488.7	517.7
31°	323.3	360.2	402.1	443.3	481.7	510.6
31.5°	318.4	354.7	395.9	436.6	474.4	503.3
32°	313.4	349.1	389.6	429.5	467.2	496.0
32.5°	308.3	343.7	383.5	422.6	459.7	488.5
33°	303.4	338.0	377.2	415.7	452.6	481.1
33.5°	298.4	332.7	371.0	408.8	445.2	473.7
34°	293.6	327.0	364.5	401.8	437.9	466.1
34.5°	288.5	321.5	358.2	394.7	430.4	458.2
35°	283.5	315.9	351.8	387.7	423.0	450.7
35.5°	278.6	310.5	345.6	380.8	415.6	443.1
36°	273.7	305.1	339.2	373.9	408.4	435.5
36.5°	268.8	299.5	332.9	367.0	401.0	427.8
37°	264.0	293.9	326.7	360.1	393.7	419.9
37.5°	259.0	288.5	320.3	353.3	386.2	412.4
38°	254.3	283.1	314.1	346.4	378.9	404.8
38.5°	249.5	277.6	307.9	339.8	371.8	397.1
39°	244.8	272.1	301.7	333.1	364.4	389.3
39.5°	240.0	266.8	295.7	326.5	357.5	382.0
40°	235.2	261.4	289.4	319.7	350.2	374.4
40.5°	230.5	256.1	283.6	313.3	343.3	366.7
41°	225.9	250.7	277.6	306.7	335.9	359.3
41.5°	221.3	245.4	271.7	300.5	329.3	352.0
42°	216.7	240.2	265.8	294.2	322.6	344.8
42.5°	212.2	235.1	260.2	288.0	315.8	337.4
43°	207.5	229.9	254.5	281.7	308.8	330.4
43.5°	203.1	224.9	248.8	275.7	302.4	323.4



TEST NUMBER: P775678

CATALOG NUMBER: HCDJBL510CSD-HCD4TRH-HCD4TRLWW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
45°	189.8	209.8	232.4	258.0	282.9	302.7
45.5°	185.4	205.0	227.2	252.2	276.9	296.1
46°	181.2	200.2	221.9	246.4	270.8	289.4
46.5°	176.8	195.3	216.7	240.9	264.7	282.7
47°	172.4	190.7	211.6	235.4	258.4	276.5
47.5°	168.3	186.0	206.6	229.9	252.6	270.2
48°	164.2	181.4	201.6	224.4	246.9	263.7
48.5°	160.1	176.8	196.7	219.3	241.3	257.6
49°	156.1	172.4	191.9	214.1	235.5	251.9
49.5°	152.0	168.1	187.1	209.1	230.1	245.9
50°	148.1	163.7	182.5	203.8	224.5	239.9
50.5°	144.2	159.5	177.8	199.0	219.2	234.4
51°	140.3	155.3	173.4	194.1	213.8	228.8
51.5°	136.6	151.2	168.9	189.3	208.9	223.1
52°	132.8	147.2	164.6	184.7	203.7	217.8
52.5°	129.1	143.2	160.1	179.9	198.7	212.7
53°	125.5	139.2	156.0	175.4	193.9	207.2
53.5°	122.0	135.3	151.7	170.9	189.0	202.0
54°	118.5	131.6	147.6	166.4	184.2	197.2
54.5°	115.0	127.7	143.4	162.1	179.7	192.3
55°	111.6	124.1	139.6	157.8	175.1	187.2
55.5°	108.3	120.4	135.8	153.6	170.5	182.8
56°	105.1	116.8	131.9	149.5	166.0	178.1
56.5°	101.8	113.4	128.1	145.4	161.8	173.4
57°	98.7	109.9	124.4	141.4	157.5	168.9
57.5°	95.7	106.4	120.6	137.4	153.3	164.4
58°	92.7	103.3	117.1	133.7	149.3	159.7
58.5°	89.8	99.9	113.5	129.9	145.2	155.4
59°	87.1	96.8	110.0	126.2	141.2	150.9
59.5°	84.3	93.6	106.7	122.4	137.2	146.5
60°	81.4	90.5	103.3	118.7	133.2	142.4
60.5°	78.6	87.4	99.9	115.3	129.4	137.8
61°	76.0	84.5	96.8	111.8	125.5	133.8
61.5°	73.3	81.5	93.5	108.3	121.6	129.6
62°	70.9	78.7	90.5	105.0	117.8	125.6
62.5°	68.5	76.0	87.3	101.6	113.9	121.5
63°	66.0	73.2	84.4	98.4	110.2	117.4
63.5°	63.7	70.5	81.3	95.2	106.5	113.5
64°	61.5	67.9	78.5	92.0	103.0	109.5
64.5°	59.3	65.4	75.7	88.9	99.5	105.8
65°	57.2	62.8	72.9	86.0	95.9	102.0
65.5°	55.1	60.3	70.1	82.8	92.6	98.5
66°	53.0	58.0	67.5	79.9	89.1	94.7



TEST NUMBER: P775678

CATALOG NUMBER: HCDJBL510CSD-HCD4TRH-HCD4TRLWW-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
67.5°	47.3	51.2	59.7	71.3	79.4	84.3
68°	45.5	49.1	57.3	68.6	76.3	80.8
68.5°	43.8	46.9	54.9	65.8	73.2	77.4
69°	42.1	44.9	52.5	63.2	70.2	74.3
69.5°	40.5	42.9	50.2	60.5	67.2	71.0
70°	39.0	41.0	48.0	58.0	64.2	67.9
70.5°	37.5	39.1	45.8	55.4	61.4	64.7
71°	36.1	37.8	43.7	53.0	58.5	61.7
71.5°	34.7	36.0	41.6	50.5	55.8	58.7
72°	33.3	34.3	39.6	48.1	53.2	55.9
72.5°	31.9	32.4	37.4	45.8	50.5	53.0
73°	30.7	30.6	35.6	43.5	47.9	50.1
73.5°	29.3	29.0	33.8	41.3	45.4	47.4
74°	28.1	27.4	32.0	39.1	43.0	44.7
74.5°	26.8	26.0	30.3	37.1	40.6	42.0
75°	25.4	24.4	28.6	35.0	38.4	39.5
75.5°	24.3	23.0	26.9	33.0	36.1	37.1
76°	23.0	21.6	25.2	30.9	34.0	34.7
76.5°	21.8	20.3	23.5	28.9	31.8	32.4
77°	20.5	19.0	22.1	27.0	29.7	29.9
77.5°	19.3	17.8	20.5	25.2	27.5	27.6
78°	18.2	16.6	19.1	23.4	25.6	25.4
78.5°	17.0	15.4	17.7	21.6	23.6	23.1
79°	15.9	14.3	16.3	20.1	21.8	21.0
79.5°	14.7	13.1	15.0	18.4	20.0	18.9
80°	13.6	12.1	13.7	16.8	18.2	16.9
80.5°	12.5	11.0	12.5	15.3	16.6	14.9
81°	11.5	10.0	11.3	13.9	15.0	13.0
81.5°	10.4	9.0	10.1	12.5	13.4	11.1
82°	9.4	8.1	9.0	11.1	12.0	9.2
82.5°	8.4	7.1	8.0	9.9	10.7	7.6
83°	7.4	6.2	6.9	8.7	9.4	5.9
83.5°	6.4	5.3	5.9	7.6	8.2	4.3
84°	5.4	4.4	4.9	6.4	7.1	3.8
84.5°	4.4	3.6	4.0	5.4	6.2	3.2
85°	3.5	2.8	3.2	4.3	5.3	2.5
85.5°	2.6	2.1	2.3	3.5	4.3	1.9
86°	1.8	1.4	1.6	2.6	3.5	1.4
86.5°	0.9	0.5	0.7	1.8	2.7	1.1
87°	0.3	0.1	0.2	0.9	1.9	0.7
87.5°	0.1	0.0	0.1	0.2	1.1	0.5
88°	0.0	0.0	0.0	0.0	0.2	0.2
88.5°	0.0	0.0	0.0	0.0	0.1	0.1



TEST NUMBER: P775678

CATALOG NUMBER: HCDJBL510CSD-HCD4TRH-HCD4TRLWW-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°	609.6	613.3	596.4	561.1	512.0	460.0	414.7	383.2	368.5	367.6	382.6
22°	607.8	611.8	594.6	558.8	508.9	456.1	410.1	378.6	363.9	362.8	377.9



44°	316.3	327.2	325.1	309.8	283.9	246.4	213.7	194.0	183.3	180.0	184.5
44.5°	309.3	319.9	318.0	303.1	278.0	241.5	209.5	190.1	179.5	176.1	180.6



66.5°	91.2	96.7	96.7	88.7	78.8	67.9	62.5	60.9	56.3	55.3	54.0
67°	87.6	93.1	93.4	85.4	76.0	65.5	60.7	58.7	54.1	53.2	52.3



89°	0.0	0.6	1.9	2.0	1.9	1.9	1.3	0.4	0.0	0.1	0.0
89.5°	0.0	0.1	1.1	1.2	1.2	1.1	0.6	0.1	0.0	0.1	0.0

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21.5°	414.2	454.2	502.2	548.2	586.2	609.6
22°	409.8	450.3	498.3	544.8	583.4	607.8



44°	198.6	219.6	243.3	269.6	296.0	316.3
44.5°	194.2	214.7	237.8	263.8	289.6	309.3



66.5°	51.1	55.7	64.8	77.0	85.8	91.2
67°	49.2	53.4	62.2	74.1	82.6	87.6

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89°	0.0	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)