

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: P775633

Luminaire Tested: HCDJBS510CSD-HCD41TRMB-1000lm-4000K

Issue Date: 2/13/2024

Test Information

Test Method: LM-79-2019
Report Number: P775633
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (A2312156B031)
Test Lab:
Issue Date: 2/13/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO COMMERCIAL
Catalog Number: HCDJBL510CSD-HCD41TRMB-1000lm-4000K
Description: 4 INCH ROUND SHALLOW-WIDE MATTE BLACK TRIM
Light Source: SELECTABLE LUMENS AND CCT ARRAY 90CRI / 4000K CCT
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 959.4 lumens
Efficiency: N/A
Efficacy: 95.9 lumens/watt
Spacing Criteria (0/90/45): 1.21 / 1.21 / 1.26
Luminous Opening: Circular (Dia: 0.33' x H: 0')
CIE Type: Direct

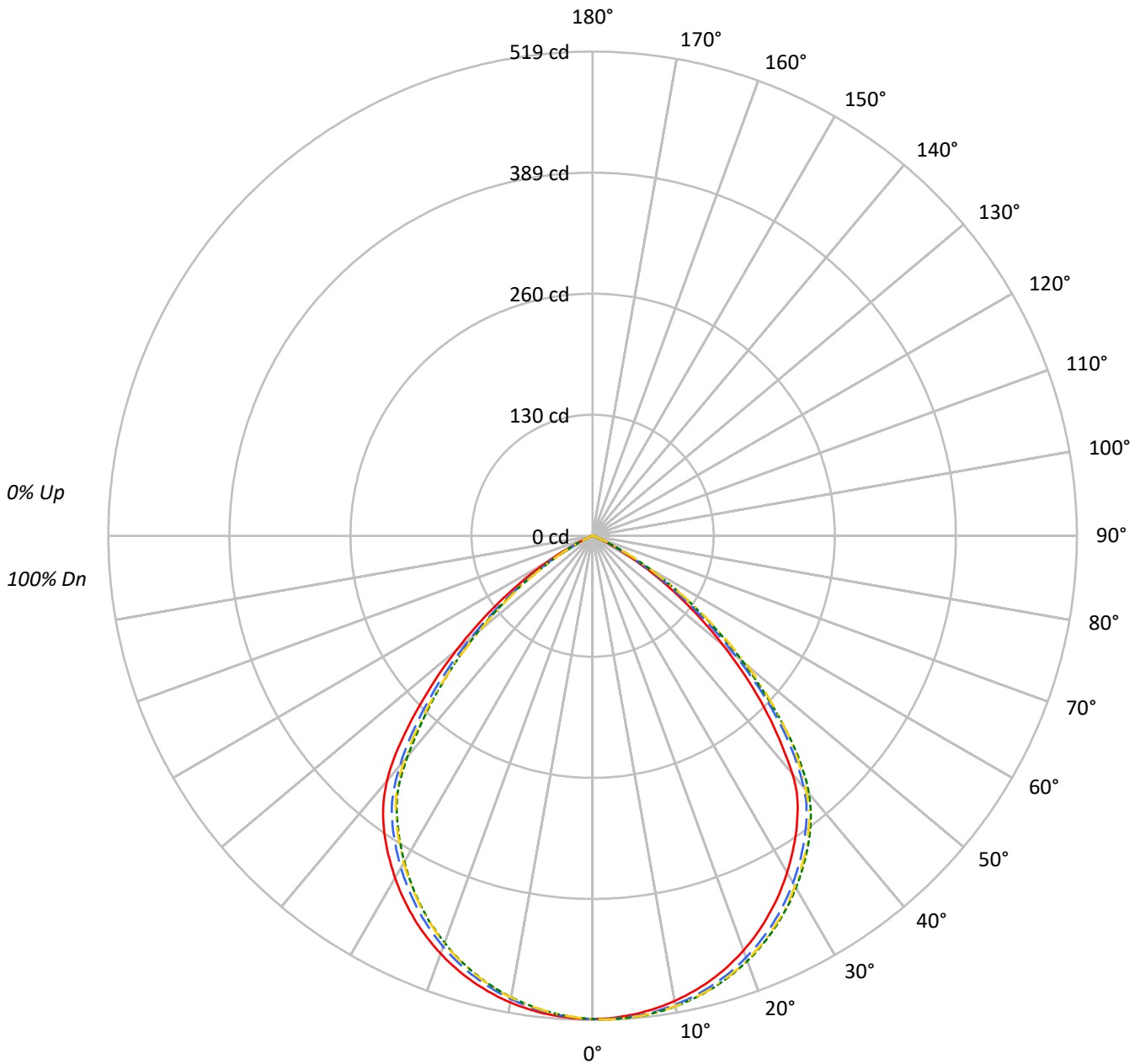
Input Watts (W): 10
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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Luminous Intensity Polar Plot





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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20				20				20				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	100	100	100
1	112	109	106	103	109	106	104	101	102	100	98	99	97	95	95	94	92	90	90	90	90
2	105	98	93	89	102	97	92	88	93	89	86	90	87	84	87	85	82	81	81	81	81
3	97	89	83	78	95	88	82	77	85	80	76	82	78	75	80	76	73	72	72	72	72
4	90	81	74	68	88	80	73	68	77	72	67	75	70	66	73	69	65	64	64	64	64
5	84	74	66	61	82	73	66	60	71	64	60	69	63	59	67	62	59	57	57	57	57
6	78	67	60	54	77	66	59	54	65	58	54	63	57	53	62	57	53	51	51	51	51
7	73	62	54	49	72	61	54	49	59	53	48	58	52	48	57	52	48	46	46	46	46
8	69	57	49	44	67	56	49	44	55	48	44	54	48	44	53	47	43	42	42	42	42
9	64	52	45	40	63	52	45	40	51	44	40	50	44	40	49	44	40	38	38	38	38
10	60	49	42	37	59	48	41	37	47	41	37	46	41	36	45	40	36	35	35	35	35

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°	270°
0°	65190	65190	65190	65190
5°	65048	65414	65123	64782
10°	64713	65442	64905	64190
15°	64167	65314	64493	63334
20°	63347	64954	63816	62169
25°	62140	64292	62862	60640
30°	60583	63315	61543	58636
35°	58565	61930	59779	56184
40°	54740	59241	56350	50666
45°	46168	51881	47769	41611
50°	35731	41233	37219	31365
55°	24530	29533	25759	20734
60°	13265	17392	14372	10471
65°	4080	6283	4467	2829
70°	405	442	405	405
75°	389	389	389	389
80°	362	362	290	362
85°	144	289	144	289

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 112.5°
 Vertical Angle: 45°
 Luminance: 52290 cd/sqm



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	48.9	5.1
10°-20°	139.2	14.5
20°-30°	207.1	21.6
30°-40°	239.3	24.9
40°-50°	201.9	21.0
50°-60°	102.7	10.7
60°-70°	19.2	2.0
70°-80°	0.8	0.1
80°-90°	0.2	0.0
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°	395.2	41.2
0°-40°	634.5	66.1
0°-60°	939.2	97.9
0°-90°	959.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	959.4	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	518	518	518	518	518	
5°	515	518	516	513	515	49
15°	492	501	495	486	492	139
25°	448	463	453	437	448	206
35°	381	403	389	366	381	237
45°	259	292	268	234	259	199
55°	112	135	117	94	112	101
65°	14	21	15	10	14	18
75°	1	1	1	1	1	1
85°	0	0	0	0	0	0
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°	518.0	518.0	518.0	518.0	518.0	518.0	518.0	518.0	518.0	518.0	518.0
0.5°	517.9	517.9	518.1	518.2	518.3	518.3	518.3	517.9	517.8	517.9	517.8
1°	517.8	518.0	518.2	518.3	518.5	518.6	518.5	518.0	517.8	517.8	517.6
1.5°	517.6	517.9	518.2	518.5	518.5	518.7	518.6	518.1	517.7	517.5	517.3
2°	517.4	517.8	518.1	518.6	518.6	518.8	518.7	518.1	517.6	517.3	516.9
2.5°	517.0	517.5	518.0	518.6	518.6	518.7	518.5	518.0	517.4	517.0	516.6
3°	516.7	517.3	517.8	518.3	518.6	518.7	518.5	517.7	517.2	516.7	516.0
3.5°	516.2	517.0	517.7	518.2	518.3	518.6	518.5	517.6	516.8	516.1	515.6
4°	515.9	516.7	517.4	518.0	518.2	518.5	518.2	517.5	516.5	515.7	515.1
4.5°	515.4	516.2	517.2	517.7	518.0	518.2	517.9	517.3	516.0	515.1	514.4
5°	514.9	515.8	516.8	517.5	517.8	517.9	517.6	516.9	515.5	514.6	513.7
5.5°	514.3	515.3	516.4	517.2	517.4	517.7	517.4	516.5	515.1	514.0	513.0
6°	513.5	514.8	516.0	516.8	517.1	517.3	517.0	516.0	514.5	513.3	512.3
6.5°	512.8	514.1	515.4	516.4	516.7	516.9	516.5	515.6	513.8	512.7	511.5
7°	512.1	513.5	514.9	515.9	516.1	516.4	515.9	515.1	513.1	511.7	510.7
7.5°	511.3	512.8	514.3	515.3	515.5	515.9	515.4	514.5	512.4	511.0	509.7
8°	510.5	512.0	513.6	514.8	515.0	515.3	514.8	513.7	511.5	510.0	508.8
8.5°	509.5	511.2	512.9	514.0	514.4	514.7	514.1	513.0	510.7	509.1	507.7
9°	508.5	510.4	512.1	513.3	513.6	514.0	513.5	512.3	509.8	508.2	506.6
9.5°	507.4	509.4	511.3	512.6	512.9	513.3	512.7	511.5	509.0	507.1	505.4
10°	506.4	508.5	510.4	511.8	512.1	512.6	511.9	510.7	507.9	506.1	504.3
10.5°	505.2	507.4	509.4	510.9	511.3	511.7	511.0	509.7	506.9	504.9	503.0
11°	504.1	506.3	508.5	509.9	510.4	510.8	510.2	508.8	505.8	503.6	501.7
11.5°	502.9	505.1	507.4	509.0	509.4	509.8	509.1	507.7	504.7	502.4	500.4
12°	501.4	504.0	506.3	507.9	508.5	508.8	508.2	506.6	503.4	501.1	498.9
12.5°	500.2	502.7	505.1	506.9	507.4	507.7	507.0	505.4	502.1	499.8	497.4
13°	498.7	501.4	503.8	505.8	506.3	506.7	505.9	504.4	500.8	498.3	495.9
13.5°	497.3	500.1	502.6	504.6	505.1	505.4	504.7	503.1	499.4	496.8	494.3
14°	495.8	498.6	501.3	503.3	503.8	504.4	503.5	501.7	498.0	495.3	492.7
14.5°	494.2	497.1	499.9	502.1	502.6	503.0	502.2	500.4	496.6	493.8	490.9
15°	492.5	495.5	498.4	500.7	501.3	501.7	500.8	499.0	495.0	492.1	489.1
15.5°	490.8	493.8	497.0	499.2	500.0	500.3	499.3	497.4	493.4	490.4	487.5
16°	489.0	492.3	495.4	497.8	498.5	498.9	497.9	496.0	491.8	488.6	485.7
16.5°	487.2	490.6	493.8	496.3	496.9	497.3	496.4	494.4	490.1	486.8	483.7
17°	485.5	488.8	492.2	494.7	495.4	495.8	494.8	492.8	488.3	485.0	481.7
17.5°	483.5	486.9	490.5	493.0	493.8	494.1	493.1	491.1	486.4	483.0	479.6
18°	481.4	485.0	488.6	491.3	492.1	492.4	491.4	489.2	484.5	481.0	477.5
18.5°	479.4	483.1	486.7	489.7	490.3	490.8	489.7	487.5	482.7	479.0	475.4
19°	477.3	481.0	484.9	487.8	488.6	489.0	487.8	485.7	480.7	476.9	473.3
19.5°	475.2	479.0	482.9	486.0	486.8	487.1	485.9	483.8	478.7	474.8	471.0
20°	473.0	476.9	480.9	484.1	485.0	485.2	484.0	481.8	476.5	472.6	468.6
20.5°	470.6	474.8	478.9	482.1	483.0	483.4	482.0	479.8	474.5	470.4	466.2
21°	468.3	472.5	476.8	480.1	481.2	481.5	480.0	477.7	472.2	468.0	463.8



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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°	461.0	465.6	470.1	473.7	474.6	475.0	473.5	471.2	465.3	460.8	456.2
23°	458.5	463.2	467.8	471.5	472.4	472.7	471.3	468.9	462.9	458.3	453.6
23.5°	455.8	460.6	465.5	469.3	470.2	470.3	469.0	466.4	460.5	455.7	450.8
24°	453.1	458.0	463.1	466.9	467.8	468.1	466.5	464.1	457.9	453.1	448.2
24.5°	450.4	455.5	460.6	464.4	465.5	465.6	464.1	461.6	455.4	450.5	445.3
25°	447.5	452.9	457.9	461.9	463.0	463.2	461.6	459.1	452.7	447.6	442.5
25.5°	444.7	450.2	455.4	459.5	460.6	460.7	459.1	456.6	449.9	444.9	439.4
26°	441.9	447.3	452.7	456.9	458.0	458.1	456.6	453.9	447.2	442.0	436.5
26.5°	439.0	444.5	450.0	454.3	455.4	455.4	453.8	451.2	444.4	439.0	433.4
27°	436.0	441.6	447.2	451.6	452.7	452.8	451.1	448.5	441.5	436.2	430.4
27.5°	432.9	438.7	444.5	449.0	449.9	450.0	448.4	445.6	438.7	433.1	427.2
28°	429.8	435.8	441.6	446.2	447.3	447.4	445.6	442.8	435.9	430.1	424.0
28.5°	426.6	432.6	438.6	443.3	444.5	444.5	442.8	439.9	432.8	427.0	420.8
29°	423.5	429.6	435.5	440.4	441.6	441.5	439.8	437.0	429.7	423.8	417.7
29.5°	420.2	426.4	432.6	437.5	438.7	438.6	436.8	434.1	426.6	420.6	414.2
30°	416.9	423.4	429.6	434.6	435.7	435.7	433.8	430.9	423.5	417.4	410.7
30.5°	413.6	420.1	426.4	431.6	432.7	432.4	430.7	427.9	420.3	414.1	407.5
31°	410.2	416.8	423.3	428.3	429.6	429.3	427.5	424.7	416.9	410.7	404.0
31.5°	406.7	413.5	420.0	425.2	426.4	426.2	424.3	421.6	413.6	407.3	400.5
32°	403.2	410.1	416.7	422.1	423.3	423.0	421.2	418.3	410.2	403.9	397.0
32.5°	399.6	406.5	413.4	418.8	419.9	419.7	417.9	415.1	406.9	400.3	393.2
33°	396.0	403.1	410.0	415.5	416.7	416.3	414.6	411.7	403.5	396.9	389.6
33.5°	392.5	399.5	406.5	412.2	413.4	413.0	411.3	408.2	399.9	393.3	385.8
34°	388.8	396.0	403.2	408.8	410.0	409.7	407.7	404.9	396.4	389.5	382.3
34.5°	385.0	392.4	399.6	405.4	406.5	406.1	404.1	401.3	392.8	385.8	378.3
35°	381.2	388.7	395.9	401.7	403.1	402.7	400.6	397.6	389.1	382.1	374.4
35.5°	377.2	384.9	392.3	398.2	399.4	399.1	397.0	394.0	385.3	378.2	370.2
36°	373.4	381.1	388.6	394.5	395.8	395.4	393.2	390.4	381.3	374.1	366.1
36.5°	369.3	377.2	384.8	390.8	392.2	391.6	389.4	386.5	377.2	369.9	361.8
37°	365.3	373.2	380.9	386.9	388.2	387.6	385.4	382.5	373.1	365.7	357.3
37.5°	360.8	368.9	376.7	382.8	384.1	383.5	381.4	378.4	368.7	361.0	351.8
38°	356.4	364.6	372.4	378.7	379.9	379.3	377.2	374.1	364.0	356.0	346.1
38.5°	351.4	359.8	368.0	374.3	375.4	374.8	372.4	369.6	359.2	350.5	340.1
39°	345.9	354.4	363.1	369.9	370.7	369.9	367.1	364.6	354.0	344.8	334.0
39.5°	339.9	348.5	357.7	365.0	365.9	364.4	361.6	359.3	348.5	338.9	327.6
40°	333.2	342.3	351.8	359.9	360.6	358.6	355.9	353.5	343.0	332.6	321.1
40.5°	325.7	336.0	345.8	354.4	355.0	352.9	349.9	347.6	336.8	326.2	314.3
41°	318.5	329.5	339.6	348.5	349.1	346.8	343.9	341.5	330.3	319.6	307.5
41.5°	311.1	322.8	333.1	342.3	342.8	340.7	337.9	335.1	323.1	312.8	300.4
42°	303.7	315.7	326.7	335.6	336.0	334.4	331.8	328.6	316.1	305.9	293.2
42.5°	296.3	308.5	319.9	328.7	329.3	328.1	325.5	322.1	308.4	298.7	285.6
43°	289.1	301.3	312.9	321.6	322.3	321.5	319.0	314.9	300.5	291.3	278.0
43.5°	281.6	293.8	305.8	314.2	314.9	314.8	312.3	308.0	292.5	283.6	270.4



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
45°	259.4	271.0	283.0	290.2	291.5	293.8	291.6	285.7	268.4	260.1	247.4
45.5°	252.0	263.2	274.9	281.6	283.3	286.5	284.2	278.2	260.4	252.0	239.7
46°	244.4	255.7	267.0	273.3	275.1	279.0	277.0	270.3	252.4	243.6	232.0
46.5°	236.7	247.9	258.8	265.0	266.9	271.5	269.7	262.7	244.3	235.3	224.2
47°	228.9	240.2	250.7	256.5	258.5	263.6	262.1	254.5	236.6	227.0	216.7
47.5°	221.0	232.5	242.5	247.9	250.4	255.9	254.6	246.5	228.9	218.8	208.9
48°	213.2	224.8	233.9	239.6	242.4	248.0	246.7	238.5	221.1	210.6	201.3
48.5°	205.3	216.9	225.5	231.3	234.4	240.1	239.2	231.2	213.3	202.2	193.8
49°	197.7	209.3	217.0	223.1	226.3	232.1	231.2	222.9	205.5	194.1	186.1
49.5°	190.0	201.5	208.7	214.9	218.4	224.0	223.5	215.0	197.8	186.0	178.4
50°	182.5	193.7	200.3	207.0	210.6	215.8	215.4	207.1	190.1	178.2	170.8
50.5°	175.0	185.8	192.0	198.7	202.7	207.7	207.4	199.4	182.4	170.2	163.0
51°	167.7	177.8	183.6	190.8	194.8	199.6	199.1	191.9	175.1	162.7	155.5
51.5°	160.2	170.1	175.6	182.8	187.0	191.7	191.5	184.3	167.4	155.1	148.1
52°	153.1	162.2	167.7	175.2	179.4	183.6	183.4	176.7	159.9	147.7	140.6
52.5°	146.1	154.7	160.0	167.1	171.6	175.7	175.4	169.1	152.7	140.5	133.2
53°	139.0	147.1	152.2	159.8	164.0	167.8	167.5	161.7	145.4	133.4	126.0
53.5°	132.0	139.6	144.6	152.3	156.6	160.0	159.7	154.4	138.2	126.4	118.9
54°	125.0	132.1	137.2	144.8	149.1	152.4	151.8	147.1	131.1	119.8	112.1
54.5°	118.3	124.7	130.0	137.1	141.6	144.7	144.2	139.9	124.3	113.5	105.5
55°	111.8	117.7	122.9	130.3	134.6	137.2	136.7	132.8	117.4	106.8	98.9
55.5°	105.3	110.5	115.9	123.4	127.6	129.9	129.0	125.7	110.6	100.2	92.9
56°	98.9	103.8	109.2	116.3	120.4	122.6	121.7	118.9	104.0	94.4	86.8
56.5°	92.6	97.2	102.6	109.3	113.5	115.4	114.5	111.9	97.8	88.5	80.8
57°	86.5	90.6	96.1	103.1	106.8	108.5	107.6	105.3	91.7	82.7	74.7
57.5°	80.5	84.3	89.8	96.6	100.2	101.7	100.8	98.9	85.6	76.8	69.1
58°	74.5	78.2	83.5	90.3	93.9	95.2	94.4	92.6	79.4	70.9	63.7
58.5°	68.9	72.3	77.5	84.2	87.6	88.7	87.8	86.2	73.3	65.7	58.5
59°	63.3	66.7	71.9	78.3	81.3	82.2	81.4	79.8	67.7	60.2	53.6
59.5°	58.0	61.3	66.3	72.6	75.1	75.7	75.0	73.4	62.4	55.3	48.9
60°	52.7	55.9	60.8	67.0	69.1	69.8	69.0	67.7	57.1	50.3	44.3
60.5°	47.9	51.0	55.6	61.8	63.6	64.0	63.4	62.0	51.9	45.7	39.8
61°	43.1	46.0	50.8	56.4	58.0	58.4	57.7	56.3	47.0	41.1	35.7
61.5°	38.6	41.5	45.9	51.4	52.6	53.0	52.3	51.1	42.5	36.9	31.9
62°	34.7	37.1	41.4	46.7	47.5	47.8	47.3	45.9	37.7	32.7	28.1
62.5°	30.9	33.5	37.1	41.9	42.5	42.9	42.3	40.8	33.4	28.8	24.6
63°	27.0	29.9	33.5	37.5	37.7	38.1	37.6	35.9	29.2	25.1	21.3
63.5°	23.2	26.4	29.9	33.6	33.2	33.6	33.1	31.5	25.3	21.8	18.4
64°	19.4	22.8	26.4	29.7	28.9	29.3	29.0	27.3	21.6	18.5	15.6
64.5°	16.4	19.3	22.8	26.0	24.8	25.3	25.0	23.3	18.3	15.6	13.0
65°	13.7	16.4	19.2	22.1	21.1	21.6	21.3	19.6	15.0	13.4	11.1
65.5°	11.3	13.8	16.3	18.3	17.7	18.1	17.9	16.4	12.6	11.2	9.4
66°	9.2	11.2	13.6	15.1	14.5	14.9	14.7	14.0	10.3	9.0	7.6



TEST NUMBER: P775633

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMB-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
67.5°	4.5	5.6	7.0	7.5	7.9	8.2	8.0	6.9	3.2	3.5	2.8
68°	3.8	4.2	5.4	5.6	5.7	5.9	5.7	4.6	1.9	2.4	2.0
68.5°	3.2	3.4	3.9	4.1	3.6	3.7	3.5	3.2	1.3	1.6	1.5
69°	2.4	2.6	3.2	3.4	2.4	2.5	2.3	2.1	1.2	1.3	1.2
69.5°	1.8	1.9	2.5	2.6	1.7	1.7	1.6	1.5	1.2	1.2	1.2
70°	1.1	1.2	1.8	1.8	1.2	1.2	1.2	1.2	1.1	1.1	1.1
70.5°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
71°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
71.5°	0.9	0.9	0.9	1.1	0.9	0.9	1.1	1.1	1.1	1.1	1.1
72°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
72.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
73°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
73.5°	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.9
74°	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
74.5°	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
75°	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
75.5°	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7
76°	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
76.5°	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
77°	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7
77.5°	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
78°	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
78.5°	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6
79°	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
79.5°	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
80°	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5
80.5°	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5
81°	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
81.5°	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.4
82°	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4
82.5°	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.3
83°	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.3
83.5°	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3
84°	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.2
84.5°	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.2
85°	0.1	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.2
85.5°	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.2
86°	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.1
86.5°	0.0	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.1
87°	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
87.5°	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
88°	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
88.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P775633

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMB-1000lm-4000K

CANDELA DISTRIBUTION (continued):

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



TEST NUMBER: P775633

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMB-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
0°	518.0	518.0	518.0	518.0	518.0	518.0
0.5°	517.7	517.7	517.9	517.8	517.6	517.9
1°	517.4	517.4	517.6	517.5	517.4	517.8
1.5°	517.0	517.0	517.2	517.2	517.1	517.6
2°	516.7	516.6	516.7	516.8	516.6	517.4
2.5°	516.2	516.0	516.2	516.1	516.1	517.0
3°	515.7	515.5	515.6	515.6	515.7	516.7
3.5°	515.1	515.0	515.0	515.1	515.2	516.2
4°	514.5	514.4	514.4	514.5	514.7	515.9
4.5°	513.7	513.6	513.6	513.7	514.0	515.4
5°	513.0	512.8	512.8	513.0	513.3	514.9
5.5°	512.3	512.0	511.9	512.1	512.7	514.3
6°	511.4	511.1	511.0	511.4	511.8	513.5
6.5°	510.6	510.3	510.0	510.5	511.0	512.8
7°	509.6	509.3	509.2	509.5	510.2	512.1
7.5°	508.6	508.3	508.2	508.5	509.3	511.3
8°	507.5	507.1	507.1	507.3	508.3	510.5
8.5°	506.4	506.1	505.9	506.3	507.1	509.5
9°	505.2	504.8	504.7	505.1	505.9	508.5
9.5°	504.1	503.5	503.4	503.8	504.8	507.4
10°	502.8	502.3	502.1	502.6	503.5	506.4
10.5°	501.4	501.0	500.8	501.3	502.4	505.2
11°	500.1	499.6	499.4	500.0	500.9	504.1
11.5°	498.6	498.1	498.0	498.4	499.5	502.9
12°	497.1	496.6	496.4	496.9	498.2	501.4
12.5°	495.7	495.0	494.8	495.3	496.6	500.2
13°	494.0	493.3	493.0	493.8	495.0	498.7
13.5°	492.3	491.7	491.3	492.1	493.4	497.3
14°	490.6	489.9	489.7	490.4	491.8	495.8
14.5°	488.8	488.1	487.8	488.6	490.1	494.2
15°	486.9	486.1	485.9	486.6	488.2	492.5
15.5°	485.0	484.2	484.0	484.7	486.3	490.8
16°	483.0	482.2	482.1	482.8	484.4	489.0
16.5°	481.2	480.2	480.0	480.8	482.4	487.2
17°	479.0	478.0	477.8	478.7	480.4	485.5
17.5°	476.9	475.9	475.7	476.6	478.3	483.5
18°	474.7	473.7	473.5	474.3	476.3	481.4
18.5°	472.4	471.4	471.2	472.1	474.1	479.4
19°	470.2	469.1	468.8	469.8	471.7	477.3
19.5°	467.8	466.7	466.4	467.4	469.5	475.2
20°	465.4	464.2	464.0	465.0	467.3	473.0
20.5°	463.0	461.7	461.4	462.4	464.8	470.6
21°	460.5	459.1	458.9	459.9	462.2	468.3



TEST NUMBER: P775633

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMB-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
22.5°	452.5	451.2	450.8	451.8	454.6	461.0
23°	449.7	448.5	448.1	449.2	451.7	458.5
23.5°	446.9	445.5	445.2	446.4	448.9	455.8
24°	444.1	442.6	442.2	443.5	446.2	453.1
24.5°	441.1	439.6	439.2	440.5	443.3	450.4
25°	438.2	436.7	436.3	437.5	440.5	447.5
25.5°	435.1	433.6	433.1	434.4	437.4	444.7
26°	432.1	430.4	430.0	431.3	434.4	441.9
26.5°	428.8	427.2	426.8	428.3	431.2	439.0
27°	425.8	424.0	423.7	425.0	428.1	436.0
27.5°	422.4	420.7	420.3	421.8	424.9	432.9
28°	419.2	417.3	416.9	418.4	421.7	429.8
28.5°	415.8	414.0	413.6	415.2	418.3	426.6
29°	412.4	410.6	410.1	411.7	415.1	423.5
29.5°	408.9	407.2	406.7	408.3	411.7	420.2
30°	405.5	403.5	403.2	404.8	408.3	416.9
30.5°	401.8	400.0	399.5	401.3	404.8	413.6
31°	398.2	396.4	395.8	397.5	401.2	410.2
31.5°	394.7	392.8	392.2	394.0	397.7	406.7
32°	391.0	389.0	388.4	390.5	394.1	403.2
32.5°	387.2	385.3	384.8	386.7	390.6	399.6
33°	383.3	381.5	381.0	382.8	386.8	396.0
33.5°	379.5	377.6	377.1	379.1	382.9	392.5
34°	375.7	373.7	373.2	375.3	379.1	388.8
34.5°	371.8	369.8	369.2	371.3	375.3	385.0
35°	367.7	365.7	365.3	367.2	371.2	381.2
35.5°	363.4	361.6	361.2	363.3	367.5	377.2
36°	359.2	357.2	356.8	359.2	363.4	373.4
36.5°	354.6	352.6	352.4	354.8	358.9	369.3
37°	349.7	347.9	347.8	350.1	354.5	365.3
37.5°	343.9	342.4	342.7	345.5	350.1	360.8
38°	337.7	336.4	336.7	339.8	344.6	356.4
38.5°	331.3	329.6	330.4	333.6	338.7	351.4
39°	324.4	322.9	323.7	327.2	332.6	345.9
39.5°	317.2	315.8	316.8	320.4	326.1	339.9
40°	310.0	308.4	309.6	313.3	319.2	333.2
40.5°	302.6	300.8	302.1	306.2	311.9	325.7
41°	295.5	293.4	294.7	299.1	304.4	318.5
41.5°	288.2	285.6	287.1	291.5	296.5	311.1
42°	281.0	278.5	279.5	284.0	288.9	303.7
42.5°	273.9	270.9	271.8	276.5	281.1	296.3
43°	266.8	263.6	264.0	268.7	273.0	289.1
43.5°	259.8	255.9	256.1	260.8	265.1	281.6



TEST NUMBER: P775633

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMB-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
45°	237.9	233.8	232.3	236.5	241.9	259.4
45.5°	230.4	226.2	224.4	228.4	234.0	252.0
46°	222.9	219.0	217.0	220.3	226.4	244.4
46.5°	215.1	211.2	209.2	212.3	218.8	236.7
47°	207.5	204.1	201.5	204.2	211.2	228.9
47.5°	200.0	196.3	193.8	196.2	203.4	221.0
48°	192.3	189.2	186.5	188.3	195.9	213.2
48.5°	184.8	181.7	178.8	180.3	188.3	205.3
49°	177.5	174.5	171.6	172.7	180.8	197.7
49.5°	170.0	167.4	164.1	165.2	173.4	190.0
50°	162.7	160.2	156.9	157.6	165.9	182.5
50.5°	155.7	153.2	149.6	150.3	158.7	175.0
51°	148.7	146.2	142.7	143.2	151.5	167.7
51.5°	141.6	139.4	135.7	136.2	144.3	160.2
52°	134.6	132.7	128.9	129.4	137.4	153.1
52.5°	128.0	126.1	122.1	122.5	130.5	146.1
53°	121.2	119.4	115.7	116.1	123.8	139.0
53.5°	114.4	113.0	109.1	109.8	117.1	132.0
54°	107.8	106.5	102.9	103.5	110.5	125.0
54.5°	101.6	100.5	96.9	97.5	104.1	118.3
55°	95.5	94.5	91.0	91.7	98.0	111.8
55.5°	89.5	88.4	85.3	86.1	91.8	105.3
56°	83.5	82.5	79.6	80.6	85.8	98.9
56.5°	77.5	76.8	74.2	75.2	80.0	92.6
57°	71.6	71.2	69.0	70.0	74.5	86.5
57.5°	66.1	65.9	64.0	64.9	68.9	80.5
58°	60.6	60.5	59.2	60.2	63.8	74.5
58.5°	55.4	55.5	54.5	55.6	58.5	68.9
59°	50.3	50.6	50.0	51.1	53.8	63.3
59.5°	45.5	46.0	45.8	46.8	49.2	58.0
60°	41.0	41.6	41.7	42.8	44.8	52.7
60.5°	36.7	37.1	37.7	38.7	40.3	47.9
61°	32.6	33.5	34.4	35.4	36.3	43.1
61.5°	28.6	30.1	31.0	32.0	32.8	38.6
62°	24.9	26.5	27.6	28.7	29.2	34.7
62.5°	21.6	22.9	24.3	25.3	25.6	30.9
63°	18.5	19.4	20.9	22.0	22.2	27.0
63.5°	15.7	16.5	18.1	19.1	19.1	23.2
64°	13.0	13.9	15.4	16.5	16.4	19.4
64.5°	11.2	11.6	13.0	14.0	13.7	16.4
65°	9.6	9.5	10.9	11.7	11.5	13.7
65.5°	7.8	7.7	8.9	9.6	9.4	11.3
66°	6.1	6.1	7.0	7.8	7.5	9.2



TEST NUMBER: P775633

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMB-1000lm-4000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
67.5°	2.4	3.0	3.4	3.4	3.4	4.5
68°	1.8	2.4	2.6	2.8	2.4	3.8
68.5°	1.4	1.8	1.9	2.2	2.2	3.2
69°	1.2	1.2	1.2	1.7	1.9	2.4
69.5°	1.2	1.2	1.1	1.2	1.6	1.8
70°	1.1	1.1	1.1	1.1	1.3	1.1
70.5°	1.1	1.1	1.1	1.1	1.1	1.1
71°	1.1	1.1	1.1	1.1	0.9	1.1
71.5°	0.9	0.9	0.9	0.9	0.9	0.9
72°	0.9	0.9	0.9	0.9	0.9	0.9
72.5°	0.9	0.9	0.9	0.9	0.9	0.9
73°	0.9	0.9	0.9	0.9	0.8	0.9
73.5°	0.8	0.8	0.8	0.8	0.8	0.8
74°	0.8	0.8	0.8	0.8	0.8	0.8
74.5°	0.8	0.8	0.8	0.8	0.8	0.8
75°	0.8	0.8	0.8	0.8	0.7	0.8
75.5°	0.7	0.7	0.7	0.7	0.7	0.7
76°	0.7	0.7	0.7	0.7	0.7	0.7
76.5°	0.7	0.7	0.7	0.7	0.7	0.7
77°	0.7	0.7	0.7	0.7	0.6	0.7
77.5°	0.6	0.6	0.6	0.6	0.6	0.6
78°	0.6	0.6	0.6	0.6	0.6	0.6
78.5°	0.6	0.6	0.6	0.6	0.5	0.6
79°	0.6	0.6	0.6	0.5	0.5	0.5
79.5°	0.5	0.5	0.5	0.5	0.5	0.5
80°	0.5	0.5	0.5	0.5	0.4	0.5
80.5°	0.5	0.5	0.5	0.5	0.4	0.4
81°	0.4	0.5	0.5	0.4	0.4	0.4
81.5°	0.4	0.4	0.4	0.4	0.3	0.4
82°	0.4	0.4	0.4	0.4	0.3	0.3
82.5°	0.4	0.4	0.4	0.3	0.3	0.3
83°	0.3	0.3	0.3	0.3	0.2	0.3
83.5°	0.3	0.3	0.3	0.3	0.2	0.2
84°	0.3	0.3	0.3	0.3	0.2	0.2
84.5°	0.2	0.2	0.2	0.2	0.1	0.1
85°	0.2	0.2	0.2	0.2	0.1	0.1
85.5°	0.2	0.2	0.2	0.2	0.1	0.1
86°	0.1	0.1	0.1	0.1	0.1	0.1
86.5°	0.1	0.1	0.1	0.1	0.1	0.0
87°	0.1	0.1	0.1	0.1	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0
88°	0.0	0.0	0.0	0.0	0.0	0.0
88.5°	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P775633

CATALOG NUMBER: HCDJBL510CSD-HCD41TRMB-1000lm-4000K

CANDELA DISTRIBUTION (continued):

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



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

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21.5°	465.9	470.3	474.7	478.0	478.9	479.3	477.8	475.6	470.0	465.7	461.4
22°	463.5	468.0	472.4	475.9	476.8	477.1	475.8	473.5	467.6	463.4	458.9



44°	274.4	286.3	298.3	306.3	307.5	308.0	305.6	300.7	284.6	275.8	262.8
44.5°	266.9	278.6	290.5	298.3	299.4	301.0	298.8	293.7	276.4	268.1	255.1



66.5°	7.4	9.1	11.1	12.3	12.3	12.7	12.4	11.7	7.9	6.9	5.7
67°	5.9	7.3	8.9	9.7	10.1	10.4	10.2	9.2	5.6	4.7	3.9



89°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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21.5°	457.8	456.6	456.1	457.3	459.6	465.9
22°	455.2	453.9	453.5	454.6	457.1	463.5



44°	252.4	248.6	248.1	252.7	257.3	274.4
44.5°	245.3	241.0	240.2	244.6	249.7	266.9



66.5°	4.4	4.8	5.5	6.1	5.8	7.4
67°	3.4	3.7	4.1	4.6	4.5	5.9

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89°	0.0	0.0	0.0	0.0	0.0	0.0
89.5°	0.0	0.0	0.0	0.0	0.0	0.0

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(END OF REPORT)