

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

Report Number: P640536

Luminaire Tested: ML5609LSWWD2W1E - 692H WW - 900LM - 3000K

Issue Date: 2/17/2023

Test Information

Test Method: LM-79-2019
Report Number: P640536
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-2212-866-132)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 2/17/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO
Catalog Number: ML5609LSWWD2W1E - 692H WW - 900LM - 3000K
Description: ML56 RR, WW OPTIC, 6" WW INSERT WITH HAZE TRIM
Light Source: (1) D2W SELECTABLE LUMEN LED 90CRI / 3000K CCT
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 698.2 lumens
Efficiency: N/A
Efficacy: 59.2 lumens/watt
Spacing Criteria (0/90/45): 1.15 / 1.12 / 1.23
Luminous Opening: Circular (Dia: 0.5' x H: 0')
CIE Type: Direct

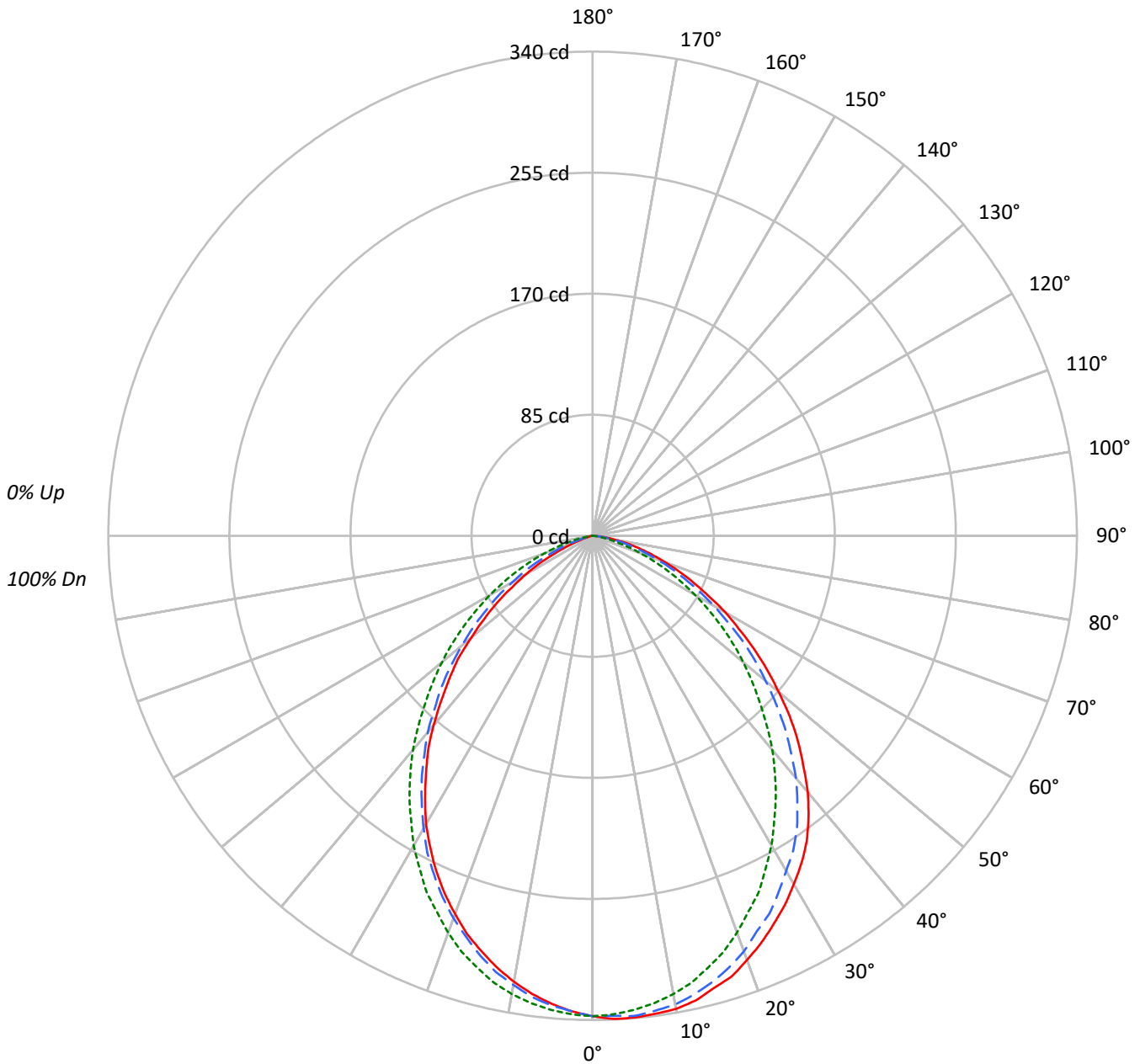
Input Watts (W): 11.8
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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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	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			
1	111	107	103	100	108	104	101	98	100	98	95	96	94	92	93	91	90	88					88			
2	102	95	89	84	100	93	88	83	90	85	81	86	83	79	84	80	78	76					76			
3	94	85	78	72	92	83	77	71	80	75	70	78	73	69	75	71	68	66					66			
4	87	76	68	62	85	75	67	62	72	66	61	70	65	60	68	63	59	57					57			
5	80	69	60	54	78	68	60	54	66	59	54	64	58	53	62	57	53	51					51			
6	75	62	54	48	73	61	54	48	60	53	48	58	52	47	57	51	47	45					45			
7	69	57	49	43	68	56	48	43	55	48	43	53	47	42	52	46	42	40					40			
8	65	52	44	39	63	52	44	39	50	43	38	49	43	38	48	42	38	36					36			
9	61	48	40	35	59	48	40	35	46	40	35	45	39	35	44	39	35	33					33			
10	57	45	37	32	56	44	37	32	43	37	32	42	36	32	41	36	32	30					30			

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°	135°	180°
0°	18496	18496	18496	18496	18496
5°	18688	18628	18391	18215	18154
10°	18782	18604	18186	17824	17702
15°	18661	18417	17804	17316	17134
20°	18493	18114	17297	16667	16481
25°	18195	17735	16695	15914	15715
30°	17882	17199	15901	15015	14806
35°	17534	16737	15004	14000	13639
40°	16817	15894	14041	12881	12423
45°	15800	14792	12870	11621	11032
50°	14524	13518	11769	10209	9467
55°	13189	12262	10513	8755	7828
60°	11819	10756	9100	7094	5910
65°	10209	9236	7549	5318	3775
70°	8639	7597	5706	3286	1731
75°	7074	5931	3643	1144	678
80°	5114	4072	1705	347	347
85°	2705	2013	692	0	0

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 15800 cd/sqm



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	31.7	4.5
10°-20°	88.6	12.7
20°-30°	127.7	18.3
30°-40°	142.7	20.4
40°-50°	130.9	18.7
50°-60°	98.3	14.1
60°-70°	56.1	8.0
70°-80°	19.6	2.8
80°-90°	2.6	0.4
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°	248.0	35.5
0°-40°	390.7	56.0
0°-60°	619.9	88.8
0°-90°	698.2	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	698.2	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	337	337	337	337	337	
5°	340	338	334	331	330	32
15°	329	324	314	305	302	93
25°	301	293	276	263	260	139
35°	262	250	224	209	204	163
45°	204	191	166	150	142	157
55°	138	128	110	92	82	123
65°	79	71	58	41	29	78
75°	33	28	17	5	3	36
85°	4	3	1	0	0	6
90°	0	0	0	0	0	



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4
2.5°	339.6	338.5	338.5	338.5	338.5	338.5	338.5	338.5	338.5	338.5	337.4
5°	339.6	339.6	339.6	339.6	339.6	339.6	339.6	338.5	338.5	338.5	338.5
7.5°	338.5	338.5	338.5	338.5	338.5	338.5	338.5	337.4	337.4	336.4	336.4
10°	337.4	337.4	337.4	336.4	336.4	336.4	336.4	336.4	335.3	335.3	334.2
12.5°	334.2	334.2	334.2	334.2	333.1	333.1	333.1	332.1	331.0	331.0	329.9
15°	328.8	329.9	329.9	328.8	328.8	328.8	328.8	327.7	326.7	325.6	324.5
17.5°	324.5	324.5	324.5	323.4	322.4	323.4	322.4	321.3	320.2	319.1	318.0
20°	317.0	317.0	315.9	315.9	315.9	315.9	314.8	313.7	312.7	311.6	310.5
22.5°	309.4	309.4	309.4	307.3	307.3	307.3	306.2	306.2	304.0	302.9	300.8
25°	300.8	300.8	300.8	299.7	298.6	297.6	298.6	296.5	295.4	293.2	293.2
27.5°	292.2	292.2	291.1	291.1	290.0	290.0	288.9	286.8	285.7	284.6	282.5
30°	282.5	282.5	281.4	281.4	280.3	279.2	279.2	277.1	276.0	273.8	271.7
32.5°	272.8	272.8	271.7	271.7	270.6	269.5	269.5	267.4	265.2	263.1	262.0
35°	262.0	262.0	260.9	260.9	259.8	258.7	257.7	255.5	254.4	251.2	250.1
37.5°	249.0	250.1	248.0	248.0	246.9	245.8	244.7	243.7	241.5	239.3	236.1
40°	235.0	233.9	233.9	232.9	231.8	231.8	230.7	228.6	227.5	224.2	222.1
42.5°	218.9	218.9	218.9	217.8	216.7	216.7	214.5	213.5	211.3	209.2	205.9
45°	203.8	203.8	202.7	202.7	200.5	200.5	199.4	197.3	196.2	193.0	190.8
47.5°	187.6	186.5	186.5	185.4	184.4	184.4	183.3	182.2	180.0	176.8	174.7
50°	170.3	170.3	170.3	169.3	168.2	168.2	167.1	165.0	163.9	161.7	158.5
52.5°	154.2	154.2	154.2	153.1	152.0	152.0	150.9	149.9	147.7	145.5	143.4
55°	138.0	138.0	138.0	136.9	136.9	134.8	134.8	133.7	131.5	129.4	128.3
57.5°	121.8	121.8	121.8	121.8	120.7	120.7	119.7	118.6	116.4	115.4	112.1
60°	107.8	106.7	106.7	105.7	105.7	104.6	103.5	102.4	101.3	99.2	98.1
62.5°	91.6	92.7	91.6	91.6	90.6	90.6	90.6	88.4	87.3	85.2	84.1
65°	78.7	78.7	78.7	78.7	76.5	76.5	76.5	74.4	73.3	73.3	71.2
67.5°	65.8	65.8	65.8	64.7	64.7	64.7	63.6	62.5	61.5	60.4	59.3
70°	53.9	53.9	53.9	52.8	52.8	51.7	51.7	50.7	49.6	49.6	47.4
72.5°	43.1	43.1	43.1	43.1	42.0	42.0	41.0	41.0	39.9	38.8	37.7
75°	33.4	33.4	33.4	32.3	32.3	32.3	31.3	31.3	30.2	29.1	28.0
77.5°	24.8	23.7	23.7	23.7	23.7	22.6	22.6	22.6	21.6	20.5	20.5
80°	16.2	16.2	16.2	16.2	16.2	15.1	15.1	15.1	14.0	14.0	12.9
82.5°	9.7	9.7	9.7	9.7	9.7	8.6	8.6	8.6	7.5	7.5	7.5
85°	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2
87.5°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
90°	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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CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4
2.5°	338.5	338.5	337.4	337.4	337.4	337.4	337.4	336.4	336.4	336.4	336.4
5°	338.5	337.4	336.4	336.4	336.4	336.4	335.3	335.3	335.3	334.2	334.2
7.5°	335.3	335.3	335.3	334.2	334.2	333.1	333.1	332.1	332.1	331.0	331.0
10°	333.1	332.1	332.1	331.0	331.0	329.9	329.9	327.7	326.7	326.7	325.6
12.5°	328.8	327.7	327.7	325.6	325.6	325.6	324.5	322.4	321.3	321.3	320.2
15°	323.4	322.4	321.3	319.1	319.1	318.0	317.0	315.9	314.8	313.7	312.7
17.5°	317.0	314.8	313.7	312.7	311.6	310.5	309.4	308.3	306.2	306.2	304.0
20°	309.4	307.3	306.2	304.0	302.9	302.9	300.8	298.6	297.6	296.5	294.3
22.5°	299.7	298.6	296.5	294.3	293.2	293.2	291.1	288.9	287.9	285.7	284.6
25°	291.1	287.9	286.8	284.6	283.5	283.5	281.4	279.2	277.1	276.0	273.8
27.5°	280.3	278.2	277.1	273.8	272.8	271.7	269.5	267.4	265.2	263.1	260.9
30°	269.5	267.4	265.2	262.0	262.0	259.8	257.7	254.4	253.4	251.2	248.0
32.5°	258.7	256.6	253.4	251.2	249.0	248.0	244.7	242.6	240.4	237.2	236.1
35°	246.9	243.7	241.5	238.3	237.2	235.0	232.9	229.6	227.5	224.2	221.0
37.5°	233.9	229.6	227.5	224.2	223.2	221.0	218.9	216.7	213.5	210.2	208.1
40°	219.9	215.6	212.4	210.2	208.1	205.9	204.8	200.5	198.4	196.2	194.1
42.5°	203.8	200.5	197.3	195.1	193.0	191.9	188.7	186.5	183.3	181.1	179.0
45°	188.7	185.4	182.2	179.0	177.9	176.8	174.7	171.4	168.2	166.0	163.9
47.5°	172.5	170.3	166.0	165.0	162.8	161.7	158.5	156.3	155.2	152.0	149.9
50°	156.3	154.2	152.0	148.8	147.7	146.6	144.5	142.3	140.2	138.0	135.8
52.5°	140.2	139.1	136.9	133.7	133.7	132.6	130.5	128.3	126.1	124.0	121.8
55°	126.1	124.0	121.8	119.7	118.6	117.5	115.4	114.3	112.1	110.0	107.8
57.5°	111.0	108.9	107.8	105.7	104.6	103.5	101.3	100.3	98.1	96.0	93.8
60°	97.0	94.9	93.8	91.6	90.6	90.6	88.4	86.2	85.2	83.0	80.9
62.5°	83.0	80.9	79.8	77.6	77.6	76.5	75.5	73.3	72.2	70.1	69.0
65°	70.1	69.0	66.8	65.8	64.7	63.6	62.5	61.5	59.3	58.2	56.1
67.5°	58.2	56.1	55.0	53.9	52.8	51.7	50.7	49.6	47.4	46.4	44.2
70°	46.4	45.3	44.2	43.1	42.0	42.0	39.9	38.8	36.7	35.6	33.4
72.5°	36.7	35.6	34.5	32.3	32.3	31.3	30.2	29.1	27.0	25.9	23.7
75°	27.0	27.0	24.8	23.7	23.7	22.6	21.6	20.5	19.4	17.2	16.2
77.5°	19.4	18.3	17.2	16.2	15.1	15.1	14.0	12.9	11.9	10.8	8.6
80°	12.9	11.9	10.8	9.7	9.7	8.6	7.5	7.5	6.5	5.4	4.3
82.5°	6.5	6.5	5.4	5.4	4.3	4.3	4.3	3.2	3.2	2.2	2.2
85°	3.2	2.2	2.2	2.2	2.2	2.2	1.1	1.1	1.1	1.1	0.0
87.5°	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90°	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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CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4
2.5°	336.4	335.3	336.4	336.4	335.3	335.3	335.3	335.3	334.2	335.3	334.2
5°	334.2	333.1	333.1	333.1	333.1	332.1	332.1	331.0	331.0	331.0	331.0
7.5°	329.9	328.8	328.8	327.7	327.7	327.7	327.7	326.7	326.7	325.6	325.6
10°	325.6	324.5	323.4	323.4	322.4	322.4	322.4	321.3	320.2	320.2	319.1
12.5°	318.0	318.0	317.0	317.0	315.9	315.9	314.8	313.7	313.7	312.7	312.7
15°	311.6	310.5	309.4	309.4	308.3	307.3	306.2	306.2	305.1	305.1	304.0
17.5°	302.9	300.8	300.8	299.7	298.6	298.6	297.6	296.5	295.4	295.4	295.4
20°	293.2	292.2	291.1	290.0	288.9	288.9	287.9	286.8	285.7	284.6	284.6
22.5°	282.5	281.4	280.3	279.2	279.2	278.2	277.1	276.0	274.9	273.8	273.8
25°	271.7	270.6	269.5	268.4	267.4	266.3	265.2	264.1	263.1	262.0	262.0
27.5°	259.8	257.7	256.6	255.5	254.4	253.4	253.4	251.2	251.2	250.1	249.0
30°	246.9	244.7	242.6	242.6	241.5	240.4	238.3	238.3	237.2	236.1	235.0
32.5°	232.9	231.8	229.6	229.6	227.5	226.4	225.3	224.2	223.2	222.1	222.1
35°	219.9	216.7	215.6	215.6	213.5	212.4	211.3	209.2	209.2	207.0	207.0
37.5°	205.9	203.8	202.7	200.5	199.4	198.4	197.3	195.1	194.1	193.0	191.9
40°	191.9	189.7	187.6	186.5	185.4	183.3	182.2	180.0	180.0	177.9	176.8
42.5°	176.8	174.7	172.5	171.4	170.3	168.2	167.1	165.0	163.9	162.8	161.7
45°	161.7	159.6	158.5	157.4	156.3	155.2	152.0	150.9	149.9	147.7	146.6
47.5°	147.7	145.5	143.4	143.4	141.2	140.2	138.0	135.8	134.8	132.6	131.5
50°	133.7	131.5	129.4	128.3	128.3	125.1	124.0	121.8	119.7	117.5	116.4
52.5°	119.7	117.5	115.4	114.3	113.2	111.0	108.9	107.8	105.7	103.5	102.4
55°	105.7	103.5	101.3	100.3	99.2	97.0	96.0	92.7	91.6	89.5	87.3
57.5°	92.7	90.6	88.4	87.3	86.2	84.1	81.9	79.8	78.7	76.5	74.4
60°	78.7	77.6	75.5	74.4	73.3	72.2	69.0	66.8	64.7	63.6	61.5
62.5°	66.8	64.7	62.5	61.5	60.4	59.3	57.1	55.0	53.9	50.7	48.5
65°	55.0	52.8	50.7	49.6	48.5	47.4	45.3	43.1	41.0	38.8	37.7
67.5°	42.0	41.0	38.8	38.8	37.7	35.6	33.4	32.3	30.2	29.1	27.0
70°	32.3	31.3	29.1	28.0	27.0	24.8	23.7	21.6	20.5	19.4	17.2
72.5°	22.6	21.6	19.4	18.3	17.2	16.2	14.0	12.9	11.9	10.8	9.7
75°	15.1	12.9	11.9	10.8	10.8	8.6	7.5	6.5	5.4	4.3	4.3
77.5°	8.6	7.5	5.4	5.4	5.4	4.3	3.2	3.2	2.2	2.2	2.2
80°	4.3	3.2	2.2	2.2	2.2	2.2	1.1	1.1	1.1	1.1	1.1
82.5°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
85°	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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: P640536

CATALOG NUMBER: ML5609LSWWD2W1E - 692H WW - 900LM - 3000K

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	337.4	337.4	337.4	337.4	337.4	337.4	337.4	337.4
2.5°	334.2	334.2	334.2	334.2	334.2	334.2	334.2	334.2
5°	331.0	329.9	329.9	329.9	329.9	329.9	329.9	329.9
7.5°	325.6	325.6	324.5	325.6	324.5	324.5	324.5	324.5
10°	319.1	319.1	319.1	319.1	318.0	318.0	318.0	318.0
12.5°	312.7	311.6	311.6	311.6	310.5	311.6	310.5	310.5
15°	304.0	302.9	302.9	302.9	302.9	301.9	302.9	301.9
17.5°	294.3	294.3	293.2	294.3	293.2	293.2	293.2	293.2
20°	283.5	283.5	283.5	282.5	283.5	282.5	282.5	282.5
22.5°	272.8	272.8	271.7	271.7	271.7	271.7	271.7	271.7
25°	260.9	260.9	260.9	260.9	259.8	259.8	259.8	259.8
27.5°	249.0	248.0	248.0	248.0	246.9	248.0	246.9	246.9
30°	235.0	235.0	233.9	233.9	233.9	232.9	232.9	233.9
32.5°	219.9	219.9	219.9	219.9	218.9	218.9	218.9	218.9
35°	205.9	205.9	204.8	204.8	204.8	203.8	203.8	203.8
37.5°	190.8	190.8	189.7	189.7	189.7	188.7	188.7	189.7
40°	175.7	175.7	174.7	174.7	174.7	173.6	173.6	173.6
42.5°	160.6	159.6	159.6	158.5	158.5	158.5	157.4	157.4
45°	145.5	144.5	144.5	144.5	143.4	142.3	142.3	142.3
47.5°	130.5	129.4	128.3	128.3	127.2	127.2	127.2	128.3
50°	115.4	114.3	114.3	113.2	112.1	112.1	112.1	111.0
52.5°	100.3	99.2	99.2	98.1	98.1	97.0	96.0	96.0
55°	86.2	85.2	84.1	83.0	83.0	81.9	81.9	81.9
57.5°	72.2	71.2	70.1	70.1	69.0	69.0	67.9	66.8
60°	59.3	58.2	57.1	57.1	56.1	55.0	53.9	53.9
62.5°	47.4	46.4	45.3	44.2	43.1	42.0	41.0	42.0
65°	36.7	34.5	33.4	32.3	32.3	31.3	30.2	29.1
67.5°	25.9	24.8	23.7	22.6	21.6	20.5	19.4	19.4
70°	16.2	14.0	14.0	14.0	12.9	11.9	10.8	10.8
72.5°	8.6	7.5	6.5	6.5	5.4	5.4	5.4	5.4
75°	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
77.5°	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
80°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
82.5°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report



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— 0°-180° - - 45°-225° - - - - 90°-270°

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(END OF REPORT)