

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: P640531

Luminaire Tested: ML5609LSWWD2W1E - 592SC WW - 900LM - 2700K

Issue Date: 2/17/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P640531  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-2212-866-129)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 2/17/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML5609LSWWD2W1E - 592SC WW - 900LM - 2700K  
Description: ML56 RR, WW OPTIC, 5" WW INSERT WITH SPECULAR CLEAR TRIM  
Light Source: (1) D2W SELECTABLE LUMEN LED 90CRI / 2700K CCT  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 651.0 lumens  
Efficiency: N/A  
Efficacy: 55.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.26  
Luminous Opening: Circular (Dia: 0.42' x H: 0')  
CIE Type: Direct

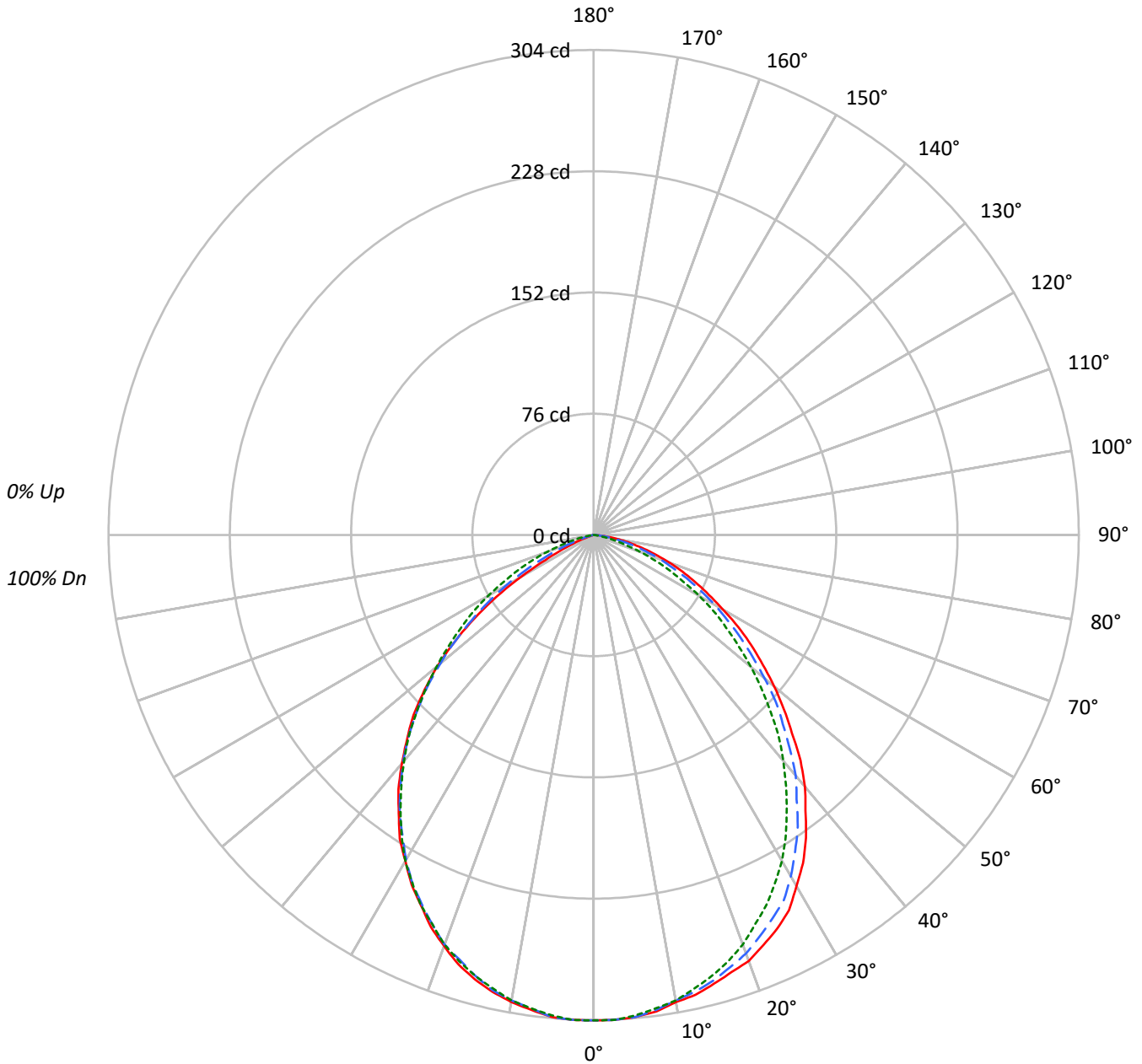
Input Watts (W): 11.8  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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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				
RW	70	50	30	10	70	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	105	101	98	100	98	95	97	94	93	93	91	90	88		
2	102	95	89	84	100	93	88	83	90	85	81	87	83	80	84	81	78	76		
3	94	85	78	72	92	83	77	71	81	75	70	78	73	69	75	71	68	66		
4	87	76	68	62	85	75	68	62	72	66	61	70	65	60	68	63	60	58		
5	80	69	61	55	78	68	60	54	66	59	54	64	58	53	62	57	53	51		
6	75	62	54	48	73	61	54	48	60	53	48	58	52	47	57	51	47	45		
7	69	57	49	43	68	56	48	43	55	48	43	53	47	42	52	46	42	40		
8	65	52	44	39	63	52	44	39	50	43	38	49	43	38	48	42	38	36		
9	61	48	40	35	59	48	40	35	46	40	35	45	39	35	44	39	35	33		
10	57	45	37	32	56	44	37	32	43	36	32	42	36	32	41	36	32	30		

**AVERAGE LUMINANCE (cd/sqm):**

	0°	45°	90°	135°	180°
0°	24022	24022	24022	24022	24022
5°	24034	24034	23955	24034	24034
10°	23831	23751	23751	23751	23831
15°	23807	23643	23390	23390	23562
20°	23875	23455	22951	22951	23035
25°	23709	23099	22307	22220	22307
30°	23162	22524	21512	21421	21512
35°	22358	21490	20324	20421	20517
40°	21218	20291	19044	19147	19250
45°	19626	18722	17494	17494	17829
50°	18127	17144	15793	15413	15671
55°	16584	15483	13956	12855	12579
60°	14746	13799	12046	9994	8241
65°	13131	12011	9750	6575	3941
70°	11587	10202	7178	3254	1154
75°	9486	7961	4301	915	305
80°	7319	5501	1818	0	0
85°	3623	2717	0	0	0

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 10°  
 Vertical Angle: 45°  
 Luminance: 19738 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	28.7	4.4
10°-20°	81.1	12.5
20°-30°	119.7	18.4
30°-40°	135.5	20.8
40°-50°	125.1	19.2
50°-60°	92.4	14.2
60°-70°	49.7	7.6
70°-80°	16.6	2.6
80°-90°	2.1	0.3
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°	229.5	35.3
0°-40°	365.0	56.1
0°-60°	582.6	89.5
0°-90°	651.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	651.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	304	304	304	304	304	
5°	303	303	302	303	303	29
15°	291	289	286	286	288	82
25°	272	265	256	255	256	125
35°	232	223	211	212	213	145
45°	176	168	157	157	160	136
55°	120	112	101	93	91	108
65°	70	64	52	35	21	70
75°	31	26	14	3	1	34
85°	4	3	0	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°	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3
2.5°	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3
5°	303.3	303.3	302.3	303.3	303.3	303.3	303.3	302.3	303.3	303.3	303.3
7.5°	301.3	300.3	300.3	300.3	300.3	300.3	300.3	300.3	300.3	300.3	300.3
10°	297.3	297.3	297.3	297.3	297.3	297.3	297.3	297.3	297.3	297.3	296.3
12.5°	295.3	294.3	294.3	294.3	294.3	294.3	294.3	293.3	294.3	293.3	293.3
15°	291.3	291.3	291.3	291.3	291.3	291.3	290.3	290.3	290.3	290.3	289.3
17.5°	287.3	287.3	288.3	288.3	287.3	287.3	287.3	286.2	285.2	285.2	284.2
20°	284.2	284.2	283.2	283.2	282.2	283.2	282.2	281.2	281.2	280.2	279.2
22.5°	278.2	278.2	278.2	278.2	278.2	277.2	277.2	276.2	275.2	274.2	272.2
25°	272.2	272.2	272.2	272.2	271.2	271.2	271.2	269.2	268.2	267.2	265.2
27.5°	265.2	264.2	264.2	264.2	263.1	263.1	262.1	261.1	260.1	259.1	258.1
30°	254.1	254.1	254.1	254.1	253.1	252.1	252.1	251.1	250.1	248.1	247.1
32.5°	244.1	244.1	243.1	242.1	242.1	242.1	241.1	240.0	238.0	237.0	235.0
35°	232.0	231.0	231.0	230.0	230.0	230.0	229.0	227.0	226.0	225.0	223.0
37.5°	218.0	219.0	218.0	218.0	216.9	215.9	214.9	213.9	212.9	210.9	208.9
40°	205.9	205.9	204.9	203.9	202.9	202.9	201.9	200.9	199.9	198.9	196.9
42.5°	191.8	191.8	190.8	190.8	189.8	189.8	187.8	186.8	185.8	184.8	181.8
45°	175.8	175.8	176.8	175.8	174.8	173.8	173.8	172.8	170.7	169.7	167.7
47.5°	161.7	162.7	161.7	160.7	160.7	159.7	159.7	157.7	157.7	155.7	154.7
50°	147.6	147.6	147.6	147.6	146.6	145.6	145.6	144.6	142.6	141.6	139.6
52.5°	133.6	133.6	133.6	133.6	132.6	132.6	131.6	130.6	129.6	127.6	125.5
55°	120.5	119.5	119.5	119.5	118.5	118.5	117.5	116.5	115.5	114.5	112.5
57.5°	107.5	106.5	106.5	105.5	105.5	104.5	104.5	103.5	102.4	100.4	99.4
60°	93.4	94.4	93.4	93.4	92.4	92.4	92.4	91.4	89.4	88.4	87.4
62.5°	81.4	82.4	81.4	80.4	80.4	80.4	80.4	78.3	77.3	76.3	75.3
65°	70.3	70.3	70.3	69.3	69.3	69.3	67.3	67.3	66.3	65.3	64.3
67.5°	60.3	59.3	59.3	59.3	58.3	58.3	57.2	57.2	55.2	55.2	53.2
70°	50.2	49.2	49.2	49.2	48.2	47.2	48.2	46.2	45.2	44.2	44.2
72.5°	40.2	40.2	39.2	39.2	39.2	38.2	38.2	37.2	36.2	35.2	34.1
75°	31.1	31.1	31.1	30.1	30.1	29.1	29.1	28.1	28.1	26.1	26.1
77.5°	23.1	23.1	23.1	22.1	22.1	22.1	21.1	21.1	20.1	19.1	18.1
80°	16.1	15.1	15.1	15.1	15.1	14.1	14.1	14.1	13.1	13.1	12.1
82.5°	9.0	9.0	9.0	9.0	9.0	9.0	8.0	8.0	8.0	7.0	7.0
85°	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0
87.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
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):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3
2.5°	304.3	304.3	304.3	304.3	303.3	304.3	303.3	304.3	304.3	304.3	304.3
5°	303.3	302.3	302.3	302.3	303.3	303.3	302.3	302.3	302.3	302.3	302.3
7.5°	300.3	300.3	300.3	299.3	300.3	300.3	299.3	300.3	300.3	299.3	300.3
10°	297.3	297.3	296.3	296.3	296.3	296.3	296.3	296.3	295.3	296.3	296.3
12.5°	293.3	293.3	293.3	292.3	292.3	292.3	292.3	292.3	291.3	291.3	292.3
15°	289.3	289.3	288.3	288.3	288.3	287.3	287.3	287.3	287.3	286.2	286.2
17.5°	284.2	283.2	283.2	282.2	282.2	281.2	281.2	280.2	280.2	280.2	279.2
20°	278.2	277.2	276.2	276.2	275.2	275.2	274.2	274.2	273.2	273.2	272.2
22.5°	271.2	270.2	269.2	268.2	268.2	267.2	267.2	266.2	265.2	264.2	264.2
25°	265.2	263.1	262.1	261.1	259.1	259.1	258.1	258.1	257.1	256.1	255.1
27.5°	256.1	254.1	253.1	252.1	251.1	250.1	248.1	248.1	247.1	246.1	245.1
30°	245.1	244.1	242.1	241.1	240.0	240.0	238.0	236.0	236.0	236.0	235.0
32.5°	234.0	232.0	231.0	229.0	228.0	228.0	227.0	225.0	224.0	224.0	223.0
35°	222.0	220.0	218.0	216.9	215.9	214.9	213.9	212.9	211.9	210.9	209.9
37.5°	207.9	205.9	204.9	203.9	202.9	201.9	200.9	199.9	198.9	197.9	198.9
40°	194.9	192.8	190.8	189.8	188.8	188.8	187.8	186.8	185.8	184.8	184.8
42.5°	180.8	178.8	177.8	176.8	175.8	174.8	173.8	172.8	171.7	171.7	170.7
45°	165.7	164.7	162.7	161.7	160.7	160.7	158.7	157.7	157.7	156.7	156.7
47.5°	152.7	150.7	148.6	147.6	146.6	145.6	144.6	143.6	142.6	142.6	142.6
50°	137.6	136.6	134.6	133.6	132.6	132.6	131.6	130.6	129.6	128.6	128.6
52.5°	123.5	122.5	122.5	120.5	119.5	119.5	117.5	117.5	115.5	114.5	113.5
55°	111.5	109.5	108.5	106.5	106.5	105.5	104.5	103.5	102.4	101.4	100.4
57.5°	97.4	96.4	95.4	94.4	94.4	93.4	92.4	91.4	89.4	89.4	87.4
60°	86.4	84.4	83.4	82.4	81.4	81.4	80.4	79.3	77.3	76.3	75.3
62.5°	74.3	72.3	72.3	71.3	69.3	69.3	68.3	66.3	65.3	63.3	62.3
65°	63.3	62.3	60.3	59.3	59.3	58.3	56.2	55.2	54.2	52.2	50.2
67.5°	52.2	51.2	50.2	48.2	48.2	47.2	45.2	44.2	42.2	41.2	39.2
70°	42.2	41.2	40.2	38.2	38.2	37.2	36.2	34.1	32.1	31.1	29.1
72.5°	33.1	32.1	31.1	29.1	29.1	28.1	26.1	25.1	23.1	21.1	20.1
75°	25.1	24.1	22.1	21.1	20.1	20.1	18.1	17.1	16.1	14.1	13.1
77.5°	17.1	16.1	15.1	14.1	14.1	13.1	12.1	11.0	10.0	9.0	7.0
80°	11.0	10.0	9.0	9.0	8.0	8.0	7.0	6.0	5.0	4.0	3.0
82.5°	6.0	6.0	5.0	4.0	4.0	4.0	3.0	3.0	2.0	1.0	1.0
85°	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	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



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**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3
2.5°	304.3	304.3	304.3	304.3	304.3	304.3	303.3	304.3	304.3	304.3	303.3
5°	303.3	302.3	302.3	303.3	302.3	302.3	303.3	303.3	303.3	302.3	302.3
7.5°	299.3	300.3	299.3	299.3	300.3	300.3	300.3	300.3	299.3	299.3	300.3
10°	296.3	296.3	295.3	296.3	295.3	296.3	296.3	296.3	296.3	296.3	296.3
12.5°	291.3	291.3	291.3	292.3	291.3	291.3	292.3	292.3	292.3	292.3	292.3
15°	285.2	285.2	286.2	285.2	286.2	286.2	286.2	286.2	286.2	286.2	287.3
17.5°	279.2	279.2	279.2	279.2	279.2	279.2	279.2	279.2	279.2	280.2	280.2
20°	272.2	272.2	272.2	272.2	272.2	271.2	272.2	272.2	273.2	273.2	273.2
22.5°	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	264.2	265.2	264.2
25°	254.1	254.1	254.1	254.1	254.1	254.1	254.1	255.1	255.1	255.1	256.1
27.5°	245.1	245.1	245.1	244.1	245.1	244.1	245.1	245.1	246.1	245.1	246.1
30°	235.0	234.0	234.0	234.0	234.0	235.0	234.0	234.0	235.0	236.0	235.0
32.5°	222.0	222.0	222.0	223.0	223.0	223.0	224.0	223.0	223.0	224.0	224.0
35°	209.9	209.9	209.9	210.9	210.9	210.9	210.9	211.9	211.9	211.9	212.9
37.5°	196.9	197.9	196.9	197.9	197.9	198.9	198.9	198.9	198.9	199.9	199.9
40°	184.8	183.8	184.8	184.8	184.8	184.8	184.8	184.8	185.8	186.8	186.8
42.5°	170.7	170.7	170.7	170.7	170.7	170.7	171.7	171.7	171.7	172.8	172.8
45°	156.7	155.7	155.7	155.7	155.7	156.7	155.7	156.7	156.7	157.7	157.7
47.5°	141.6	141.6	141.6	141.6	141.6	141.6	141.6	141.6	141.6	142.6	141.6
50°	128.6	127.6	126.6	126.6	125.5	126.6	125.5	125.5	125.5	126.6	125.5
52.5°	113.5	112.5	111.5	111.5	111.5	110.5	109.5	109.5	109.5	108.5	108.5
55°	100.4	99.4	97.4	98.4	96.4	95.4	95.4	94.4	93.4	93.4	92.4
57.5°	86.4	85.4	84.4	83.4	83.4	81.4	80.4	79.3	78.3	77.3	75.3
60°	74.3	72.3	70.3	70.3	69.3	68.3	66.3	64.3	63.3	61.3	60.3
62.5°	61.3	59.3	57.2	56.2	55.2	54.2	52.2	50.2	48.2	47.2	45.2
65°	49.2	47.2	45.2	44.2	43.2	41.2	39.2	37.2	35.2	33.1	32.1
67.5°	37.2	35.2	34.1	32.1	31.1	29.1	27.1	26.1	24.1	22.1	19.1
70°	27.1	25.1	23.1	22.1	21.1	19.1	18.1	16.1	14.1	13.1	11.0
72.5°	18.1	16.1	15.1	14.1	13.1	12.1	10.0	9.0	7.0	6.0	5.0
75°	11.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0
77.5°	6.0	5.0	4.0	4.0	3.0	2.0	2.0	1.0	1.0	1.0	1.0
80°	3.0	2.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0
82.5°	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	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	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: P640531

CATALOG NUMBER: ML5609LSWWD2W1E - 592SC WW - 900LM - 2700K

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3
2.5°	304.3	304.3	304.3	304.3	304.3	304.3	304.3	304.3
5°	303.3	303.3	302.3	303.3	302.3	302.3	302.3	303.3
7.5°	300.3	300.3	300.3	300.3	300.3	300.3	300.3	300.3
10°	296.3	296.3	296.3	297.3	297.3	297.3	296.3	297.3
12.5°	292.3	292.3	292.3	293.3	292.3	293.3	292.3	293.3
15°	287.3	287.3	288.3	288.3	287.3	287.3	288.3	288.3
17.5°	280.2	281.2	281.2	281.2	281.2	281.2	281.2	282.2
20°	274.2	274.2	273.2	274.2	274.2	275.2	275.2	274.2
22.5°	264.2	266.2	266.2	266.2	266.2	266.2	266.2	266.2
25°	256.1	256.1	256.1	257.1	256.1	256.1	257.1	256.1
27.5°	246.1	247.1	246.1	247.1	247.1	247.1	247.1	247.1
30°	236.0	236.0	236.0	236.0	236.0	237.0	236.0	236.0
32.5°	224.0	225.0	225.0	225.0	226.0	225.0	225.0	226.0
35°	212.9	212.9	212.9	213.9	212.9	213.9	213.9	212.9
37.5°	199.9	200.9	199.9	200.9	200.9	200.9	200.9	200.9
40°	187.8	186.8	187.8	186.8	187.8	187.8	187.8	186.8
42.5°	172.8	173.8	173.8	173.8	173.8	173.8	173.8	172.8
45°	157.7	158.7	158.7	158.7	158.7	158.7	159.7	159.7
47.5°	141.6	143.6	143.6	143.6	142.6	144.6	143.6	143.6
50°	125.5	125.5	126.6	126.6	127.6	127.6	127.6	127.6
52.5°	109.5	108.5	109.5	109.5	110.5	109.5	110.5	109.5
55°	91.4	91.4	91.4	90.4	91.4	91.4	91.4	91.4
57.5°	75.3	74.3	73.3	72.3	72.3	72.3	71.3	72.3
60°	58.3	56.2	57.2	55.2	54.2	53.2	53.2	52.2
62.5°	43.2	41.2	40.2	39.2	37.2	35.2	35.2	34.1
65°	29.1	27.1	26.1	24.1	23.1	22.1	21.1	21.1
67.5°	18.1	16.1	16.1	15.1	14.1	13.1	12.1	12.1
70°	10.0	9.0	8.0	7.0	7.0	6.0	5.0	5.0
72.5°	4.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0
75°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
77.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
80°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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)