

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: P640538

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

Issue Date: 2/17/2023

Test Information

Test Method: LM-79-2019
Report Number: P640538
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-2212-866-131)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 2/17/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO
Catalog Number: ML5609LSWWD2W1E - 692SC WW - 900LM - 3000K
Description: ML56 RR, WW OPTIC, 6" WW INSERT WITH SPECULAR CLEAR TRIM
Light Source: (1) D2W SELECTABLE LUMEN LED 90CRI / 3000K CCT
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 714.7 lumens
Efficiency: N/A
Efficacy: 60.6 lumens/watt
Spacing Criteria (0/90/45): 1.13 / 1.09 / 1.17
Luminous Opening: Circular (Dia: 0.5' x H: 0')
CIE Type: Direct

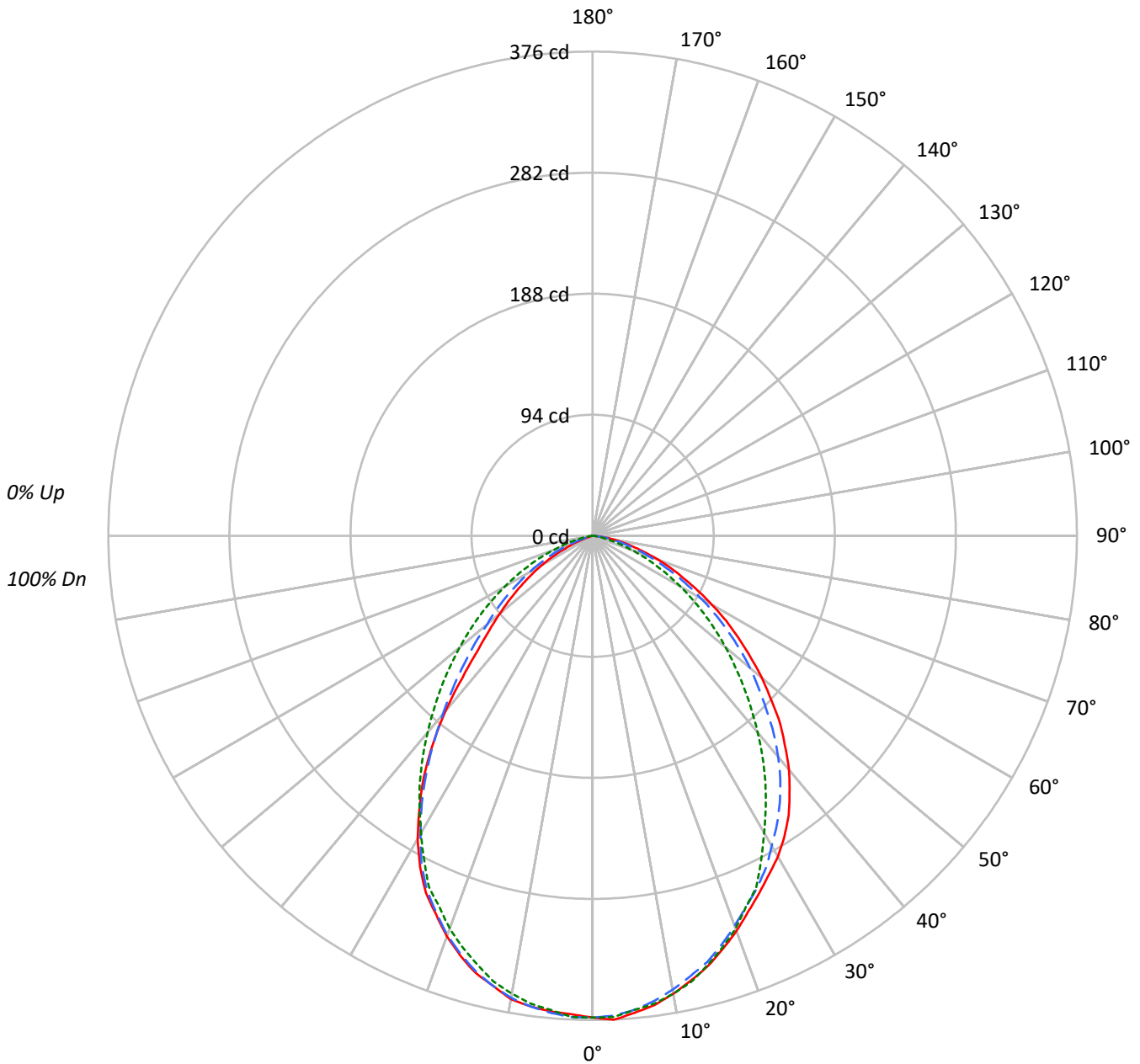
Input Watts (W): 11.8
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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Luminous Intensity Polar Plot





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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20									20									20									20									
RC	80									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																
1	111	107	104	100	108	105	102	99	101	98	96	97	95	93	93	92	90	88			88																
2	103	96	90	85	100	94	89	84	90	86	82	87	84	80	84	81	79	77			77																
3	95	86	79	73	92	84	78	72	81	76	71	79	74	70	76	72	69	67			67																
4	88	77	69	64	85	76	69	63	73	67	62	71	66	62	69	65	61	59			59																
5	81	70	62	56	79	69	61	56	67	60	55	65	59	55	63	58	54	52			52																
6	76	64	56	50	74	63	55	50	61	54	49	59	53	49	58	53	48	46			46																
7	70	58	50	45	69	57	50	44	56	49	44	55	48	44	53	48	44	42			42																
8	66	53	46	40	64	53	45	40	52	45	40	50	44	40	49	44	40	38			38																
9	62	49	42	37	60	49	42	37	48	41	36	47	41	36	46	40	36	34			34																
10	58	46	39	34	57	45	38	34	44	38	33	44	38	33	43	37	33	32			32																

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°	135°	180°
0°	20508	20508	20508	20508	20508
5°	20465	20344	20344	20465	20405
10°	20101	19923	20101	20285	20340
15°	19637	19455	19580	19881	19943
20°	19053	18802	18931	19246	19304
25°	18515	18255	18195	18388	18515
30°	18218	17604	16857	16920	17199
35°	17748	16952	15653	15078	15292
40°	16975	16044	14270	12960	12731
45°	15963	14792	12870	10947	9776
50°	14618	13603	11488	9100	8000
55°	13189	12157	10093	7723	6490
60°	11699	10635	8629	6260	4967
65°	10066	9093	6992	4618	3074
70°	8639	7437	5177	2597	1202
75°	6841	5698	3431	678	0
80°	5114	4072	1705	0	0
85°	2705	2013	0	0	0

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 15963 cd/sqm



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	35.1	4.9
10°-20°	97.3	13.6
20°-30°	138.7	19.4
30°-40°	149.2	20.9
40°-50°	128.6	18.0
50°-60°	93.2	13.0
60°-70°	52.6	7.4
70°-80°	17.9	2.5
80°-90°	2.3	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°	271.1	37.9
0°-40°	420.3	58.8
0°-60°	642.0	89.8
0°-90°	714.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	714.7	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	374	374	374	374	374	
5°	372	370	370	372	371	35
15°	346	343	345	350	351	97
25°	306	302	301	304	306	141
35°	265	253	234	225	228	165
45°	206	191	166	141	126	158
55°	138	127	106	81	68	124
65°	78	70	54	36	24	78
75°	32	27	16	3	0	35
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°	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1
2.5°	376.2	373.0	371.9	373.0	373.0	373.0	373.0	373.0	373.0	371.9	373.0
5°	371.9	368.7	368.7	368.7	368.7	368.7	367.6	368.7	368.7	368.7	369.7
7.5°	367.6	363.3	364.4	363.3	364.4	363.3	363.3	364.4	363.3	364.4	364.4
10°	361.1	357.9	357.9	357.9	357.9	357.9	357.9	357.9	357.9	357.9	357.9
12.5°	353.6	350.3	350.3	350.3	350.3	350.3	350.3	350.3	351.4	350.3	350.3
15°	346.0	341.7	342.8	341.7	341.7	341.7	341.7	341.7	341.7	341.7	342.8
17.5°	336.3	333.1	333.1	333.1	333.1	333.1	333.1	332.0	333.1	333.1	333.1
20°	326.6	323.4	323.4	322.3	323.4	322.3	322.3	322.3	323.4	322.3	322.3
22.5°	315.8	312.6	313.7	312.6	312.6	312.6	312.6	312.6	311.5	312.6	311.5
25°	306.1	305.1	304.0	305.1	304.0	304.0	304.0	302.9	302.9	302.9	301.8
27.5°	296.4	294.3	294.3	294.3	294.3	293.2	293.2	293.2	292.1	291.1	291.1
30°	287.8	284.6	284.6	284.6	283.5	283.5	282.4	282.4	280.3	279.2	278.1
32.5°	277.0	274.9	273.8	273.8	272.7	272.7	271.7	271.7	269.5	268.4	266.3
35°	265.2	264.1	264.1	263.0	261.9	260.9	259.8	258.7	257.6	255.5	253.3
37.5°	251.2	250.1	249.0	249.0	247.9	246.9	246.9	244.7	243.6	241.5	239.3
40°	237.2	235.0	235.0	233.9	232.8	231.8	231.8	229.6	228.5	226.4	224.2
42.5°	221.0	218.8	218.8	217.8	217.8	217.8	216.7	214.5	212.4	210.2	208.1
45°	205.9	203.7	203.7	201.6	201.6	200.5	199.4	198.3	196.2	194.0	190.8
47.5°	187.6	186.5	186.5	185.4	184.3	183.3	183.3	182.2	180.0	176.8	174.6
50°	171.4	170.3	170.3	169.2	168.2	167.1	166.0	164.9	163.9	161.7	159.5
52.5°	154.2	154.2	153.1	152.0	152.0	150.9	149.8	148.8	146.6	144.4	143.4
55°	138.0	136.9	136.9	135.8	135.8	134.7	133.7	132.6	131.5	129.4	127.2
57.5°	122.9	120.7	120.7	119.7	119.7	119.7	118.6	116.4	115.3	113.2	112.1
60°	106.7	105.6	105.6	105.6	104.6	103.5	103.5	101.3	100.3	99.2	97.0
62.5°	91.6	90.6	90.6	90.6	89.5	89.5	88.4	87.3	86.2	85.2	83.0
65°	77.6	77.6	77.6	76.5	76.5	75.5	74.4	74.4	73.3	72.2	70.1
67.5°	65.8	64.7	64.7	64.7	63.6	63.6	62.5	61.4	60.4	59.3	57.1
70°	53.9	52.8	52.8	51.7	51.7	51.7	51.7	50.7	48.5	48.5	46.4
72.5°	42.0	42.0	42.0	41.0	41.0	41.0	39.9	39.9	38.8	37.7	36.7
75°	32.3	32.3	32.3	31.3	31.3	31.3	30.2	30.2	29.1	28.0	26.9
77.5°	23.7	23.7	23.7	22.6	22.6	22.6	21.6	21.6	20.5	20.5	19.4
80°	16.2	16.2	16.2	15.1	15.1	15.1	15.1	14.0	14.0	12.9	12.9
82.5°	9.7	9.7	9.7	9.7	8.6	8.6	8.6	8.6	8.6	7.5	7.5
85°	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	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°	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1
2.5°	373.0	373.0	373.0	373.0	373.0	373.0	373.0	373.0	373.0	374.1	373.0
5°	369.7	369.7	369.7	369.7	369.7	369.7	370.8	369.7	370.8	369.7	370.8
7.5°	364.4	364.4	365.4	365.4	364.4	365.4	365.4	365.4	365.4	366.5	366.5
10°	357.9	359.0	359.0	360.0	360.0	360.0	360.0	361.1	361.1	361.1	361.1
12.5°	351.4	351.4	351.4	351.4	352.5	351.4	352.5	352.5	353.6	354.7	353.6
15°	341.7	342.8	342.8	342.8	342.8	342.8	343.9	345.0	345.0	345.0	346.0
17.5°	333.1	333.1	333.1	334.2	333.1	334.2	334.2	334.2	335.3	335.3	336.3
20°	322.3	321.2	323.4	322.3	322.3	323.4	323.4	323.4	324.5	324.5	324.5
22.5°	310.5	311.5	310.5	310.5	311.5	311.5	311.5	310.5	311.5	311.5	312.6
25°	300.8	300.8	300.8	300.8	300.8	300.8	300.8	299.7	300.8	300.8	300.8
27.5°	290.0	287.8	287.8	286.7	286.7	285.7	284.6	284.6	284.6	283.5	284.6
30°	277.0	274.9	273.8	272.7	271.7	271.7	269.5	268.4	267.3	266.3	265.2
32.5°	264.1	261.9	260.9	259.8	257.6	256.6	254.4	253.3	252.2	250.1	247.9
35°	252.2	249.0	246.9	244.7	243.6	242.5	240.4	238.2	236.1	233.9	231.8
37.5°	236.1	233.9	231.8	229.6	228.5	227.5	225.3	221.0	218.8	216.7	214.5
40°	222.1	218.8	216.7	213.4	212.4	210.2	208.1	204.8	201.6	199.4	197.3
42.5°	204.8	202.7	200.5	197.3	196.2	194.0	190.8	188.6	186.5	182.2	180.0
45°	188.6	186.5	184.3	181.1	178.9	177.9	175.7	172.5	169.2	166.0	163.9
47.5°	172.5	170.3	167.1	164.9	162.8	161.7	159.5	156.3	153.1	149.8	147.7
50°	156.3	154.2	152.0	147.7	147.7	145.5	143.4	140.1	138.0	134.7	131.5
52.5°	141.2	138.0	135.8	132.6	132.6	131.5	128.3	125.0	122.9	119.7	117.5
55°	125.0	122.9	120.7	118.6	116.4	115.3	114.3	111.0	107.8	105.6	102.4
57.5°	110.0	106.7	105.6	103.5	102.4	101.3	99.2	95.9	93.8	91.6	89.5
60°	95.9	93.8	90.6	89.5	88.4	87.3	85.2	83.0	80.8	78.7	76.5
62.5°	81.9	79.8	77.6	75.5	74.4	73.3	72.2	70.1	67.9	65.8	63.6
65°	67.9	66.8	64.7	63.6	62.5	61.4	59.3	57.1	56.1	53.9	51.7
67.5°	56.1	55.0	52.8	51.7	50.7	50.7	47.4	46.4	44.2	43.1	41.0
70°	45.3	44.2	42.0	41.0	39.9	38.8	37.7	36.7	34.5	32.3	31.3
72.5°	35.6	33.4	32.3	31.3	30.2	30.2	28.0	26.9	24.8	23.7	21.6
75°	25.9	24.8	23.7	22.6	22.6	21.6	20.5	19.4	17.2	16.2	15.1
77.5°	18.3	17.2	16.2	15.1	15.1	14.0	12.9	11.9	10.8	9.7	8.6
80°	11.9	10.8	10.8	9.7	8.6	8.6	7.5	6.5	5.4	5.4	4.3
82.5°	6.5	6.5	5.4	5.4	4.3	4.3	3.2	3.2	2.2	2.2	1.1
85°	3.2	2.2	2.2	2.2	2.2	1.1	1.1	1.1	0.0	0.0	0.0
87.5°	1.1	1.1	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°	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1
2.5°	373.0	373.0	373.0	373.0	373.0	373.0	373.0	373.0	374.1	373.0	373.0
5°	370.8	370.8	371.9	370.8	371.9	371.9	370.8	370.8	371.9	373.0	371.9
7.5°	366.5	366.5	367.6	367.6	367.6	367.6	367.6	368.7	368.7	369.7	369.7
10°	362.2	362.2	362.2	362.2	363.3	363.3	364.4	364.4	364.4	364.4	364.4
12.5°	354.7	355.7	355.7	355.7	355.7	356.8	356.8	357.9	357.9	357.9	359.0
15°	346.0	347.1	348.2	348.2	347.1	348.2	349.3	349.3	350.3	350.3	350.3
17.5°	336.3	337.4	337.4	338.5	337.4	339.6	339.6	340.6	340.6	341.7	341.7
20°	325.6	326.6	326.6	326.6	327.7	327.7	328.8	328.8	329.9	329.9	329.9
22.5°	312.6	313.7	313.7	313.7	313.7	314.8	314.8	315.8	316.9	318.0	316.9
25°	300.8	301.8	302.9	301.8	302.9	302.9	302.9	304.0	304.0	305.1	304.0
27.5°	284.6	284.6	284.6	285.7	286.7	286.7	286.7	287.8	287.8	287.8	288.9
30°	265.2	264.1	265.2	265.2	265.2	265.2	267.3	267.3	267.3	268.4	269.5
32.5°	246.9	246.9	246.9	245.8	245.8	245.8	245.8	246.9	246.9	247.9	249.0
35°	229.6	228.5	226.4	226.4	226.4	225.3	224.2	224.2	225.3	225.3	225.3
37.5°	211.3	210.2	209.1	207.0	207.0	204.8	203.7	202.7	202.7	201.6	201.6
40°	194.0	191.9	189.7	189.7	187.6	186.5	184.3	183.3	181.1	178.9	178.9
42.5°	176.8	174.6	172.5	171.4	169.2	168.2	164.9	162.8	160.6	159.5	157.4
45°	160.6	158.5	155.2	154.2	152.0	149.8	147.7	144.4	141.2	139.1	138.0
47.5°	144.4	142.3	139.1	136.9	135.8	132.6	130.4	127.2	124.0	120.7	117.5
50°	129.4	126.1	122.9	120.7	119.7	116.4	114.3	111.0	106.7	105.6	102.4
52.5°	114.3	111.0	107.8	106.7	105.6	102.4	99.2	95.9	93.8	90.6	88.4
55°	99.2	97.0	93.8	92.7	91.6	88.4	85.2	83.0	80.8	77.6	75.5
57.5°	86.2	84.1	80.8	79.8	78.7	75.5	73.3	70.1	67.9	65.8	63.6
60°	74.4	71.1	69.0	67.9	66.8	63.6	61.4	59.3	57.1	55.0	51.7
62.5°	61.4	59.3	57.1	56.1	53.9	52.8	49.6	48.5	45.3	44.2	42.0
65°	49.6	47.4	45.3	45.3	44.2	41.0	39.9	37.7	35.6	33.4	32.3
67.5°	39.9	37.7	35.6	34.5	33.4	31.3	30.2	28.0	25.9	24.8	22.6
70°	30.2	28.0	25.9	24.8	23.7	22.6	20.5	18.3	16.2	15.1	12.9
72.5°	20.5	18.3	17.2	17.2	16.2	14.0	11.9	10.8	8.6	7.5	6.5
75°	12.9	10.8	9.7	8.6	8.6	7.5	5.4	4.3	3.2	2.2	1.1
77.5°	7.5	6.5	5.4	4.3	4.3	3.2	2.2	1.1	1.1	0.0	0.0
80°	3.2	2.2	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	1.1	1.1	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: P640538

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

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	374.1	374.1	374.1	374.1	374.1	374.1	374.1	374.1
2.5°	373.0	373.0	373.0	373.0	371.9	371.9	371.9	371.9
5°	371.9	371.9	371.9	371.9	370.8	370.8	371.9	370.8
7.5°	369.7	369.7	368.7	368.7	368.7	368.7	368.7	368.7
10°	365.4	365.4	365.4	364.4	365.4	365.4	364.4	365.4
12.5°	359.0	359.0	359.0	359.0	357.9	357.9	359.0	357.9
15°	351.4	351.4	351.4	351.4	351.4	350.3	351.4	351.4
17.5°	342.8	342.8	341.7	341.7	341.7	342.8	342.8	341.7
20°	330.9	330.9	330.9	330.9	330.9	330.9	330.9	330.9
22.5°	318.0	318.0	318.0	318.0	318.0	318.0	318.0	318.0
25°	305.1	305.1	305.1	305.1	305.1	305.1	305.1	306.1
27.5°	288.9	288.9	288.9	288.9	288.9	287.8	287.8	290.0
30°	269.5	270.6	270.6	270.6	270.6	270.6	270.6	271.7
32.5°	250.1	250.1	250.1	251.2	250.1	251.2	250.1	250.1
35°	227.5	227.5	227.5	227.5	227.5	228.5	228.5	228.5
37.5°	201.6	202.7	202.7	203.7	203.7	203.7	204.8	203.7
40°	177.9	177.9	177.9	176.8	177.9	176.8	177.9	177.9
42.5°	155.2	153.1	153.1	152.0	152.0	150.9	149.8	149.8
45°	134.7	131.5	131.5	130.4	129.4	127.2	126.1	126.1
47.5°	115.3	114.3	113.2	112.1	111.0	108.9	107.8	108.9
50°	99.2	98.1	97.0	97.0	95.9	94.9	93.8	93.8
52.5°	86.2	84.1	83.0	83.0	81.9	80.8	80.8	80.8
55°	73.3	71.1	71.1	71.1	70.1	69.0	69.0	67.9
57.5°	61.4	59.3	59.3	58.2	57.1	57.1	57.1	56.1
60°	50.7	48.5	47.4	47.4	46.4	45.3	45.3	45.3
62.5°	39.9	38.8	36.7	36.7	35.6	34.5	33.4	34.5
65°	30.2	28.0	26.9	26.9	25.9	24.8	23.7	23.7
67.5°	20.5	19.4	18.3	18.3	16.2	16.2	15.1	15.1
70°	11.9	10.8	10.8	9.7	8.6	8.6	7.5	7.5
72.5°	5.4	4.3	4.3	3.2	3.2	2.2	2.2	2.2
75°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0
77.5°	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0
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)