

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: P887080

Luminaire Tested: ML412LSFLD2W1E-TIR4D25AWW-TL4RWMB-600LM-2700K

Issue Date: 7/9/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P887080  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-47)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 7/9/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML412LSFLD2W1E-TIR4D25AWW-TL4RWMB-600LM-2700K  
Description: 4IN ROUND ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE BLACK TRIM  
Light Source: (1) D2W LED 90CRI / 2700K CCT  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 488.5 lumens  
Efficiency: N/A  
Efficacy: 52.0 lumens/watt  
Spacing Criteria (0/90/45): 1.15 / 0.8 / 0.99  
Luminous Opening: Circular (Dia: 0.25' x H: 0')  
CIE Type: Direct

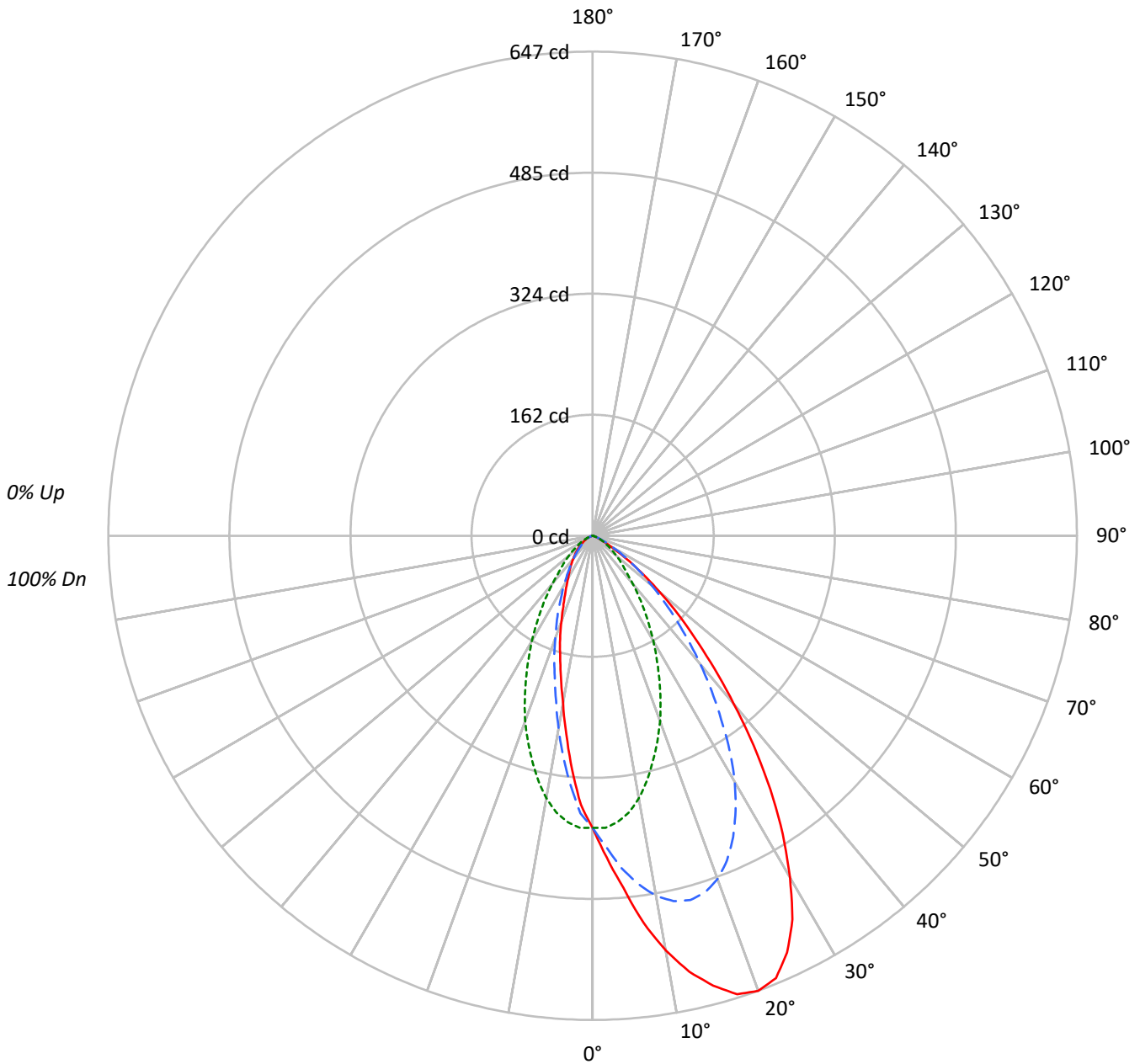
Input Watts (W): 9.4  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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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	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	113	109	106	104	110	107	105	102	103	101	99	99	98	96	96	95	93	91								
2	106	100	95	91	103	98	94	90	95	91	88	92	89	86	89	87	85	83								
3	99	92	86	81	97	90	85	81	87	83	79	85	81	78	83	79	77	75								
4	93	84	78	73	91	83	77	72	81	76	71	79	74	71	77	73	70	68								
5	87	78	71	66	86	77	70	65	75	69	65	73	68	64	71	67	64	62								
6	82	72	65	60	80	71	64	60	69	64	59	68	63	59	66	62	58	57								
7	77	67	60	55	76	66	59	55	64	59	54	63	58	54	62	57	54	52								
8	73	62	55	50	72	61	55	50	60	54	50	59	54	50	58	53	50	48								
9	69	58	51	47	68	57	51	47	56	50	46	55	50	46	54	50	46	44								
10	65	54	48	43	64	54	47	43	53	47	43	52	47	43	51	46	43	41								

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

	0°	45°	90°	135°	180°
0°	85563	85563	85563	85563	85563
5°	104006	98173	84525	73762	69007
10°	125270	108816	79313	58226	50656
15°	141272	114405	70693	44291	37980
20°	150980	113923	61489	33883	28352
25°	148702	107474	50930	25768	21171
30°	133464	96179	41044	19294	16560
35°	110771	80120	31829	14750	13786
40°	83986	64020	23730	11192	11479
45°	59696	48532	18048	8621	9737
50°	39675	34847	13884	6857	8085
55°	23206	24200	10437	5696	6499
60°	10613	14231	8333	4736	5175
65°	5344	7472	5604	3736	3995
70°	2949	3654	3654	2629	2308
75°	1271	1271	1779	847	424
80°	0	316	631	0	0
85°	0	0	0	0	0

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 10°  
 Vertical Angle: 45°  
 Luminance: 60502 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	36.8	7.5
10°-20°	98.8	20.2
20°-30°	127.2	26.0
30°-40°	110.2	22.6
40°-50°	69.2	14.2
50°-60°	33.2	6.8
60°-70°	11.2	2.3
70°-80°	1.9	0.4
80°-90°	0.1	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°	262.8	53.8
0°-40°	373.0	76.4
0°-60°	475.4	97.3
0°-90°	488.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	488.5	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	390	390	390	390	390	
5°	472	446	384	335	314	48
15°	622	504	311	195	167	176
25°	615	444	210	106	88	278
35°	414	299	119	55	52	256
45°	192	156	58	28	31	151
55°	61	63	27	15	17	56
65°	10	14	11	7	8	11
75°	2	2	2	1	0	2
85°	0	0	0	0	0	0
90°	0	0	0	0	0	



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**CANDELA DISTRIBUTION (FULL):**

	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	112.5°
0°	390.2	390.2	390.2	390.2	390.2	390.2	390.2	390.2	390.2	390.2	390.2
2.5°	430.3	425.2	426.2	423.6	419.5	413.3	409.2	403.0	397.4	390.7	378.8
5°	472.5	473.0	467.4	461.2	454.0	438.0	426.2	412.3	397.9	384.0	356.7
7.5°	521.9	518.9	511.6	496.2	480.2	459.1	438.0	415.9	394.3	372.7	331.5
10°	562.6	558.0	546.6	526.6	504.4	473.0	444.2	412.3	383.0	356.2	303.7
12.5°	596.6	592.5	577.0	550.2	518.9	481.3	442.7	404.1	368.0	335.1	272.8
15°	622.3	616.7	596.6	565.7	526.6	481.3	437.0	390.7	349.5	311.4	243.5
17.5°	642.4	633.6	607.9	571.9	525.0	474.6	423.1	374.2	328.4	287.7	214.6
20°	647.0	639.3	610.0	568.3	517.3	459.1	405.1	351.0	305.2	263.5	188.4
22.5°	639.8	628.0	601.2	555.9	499.8	439.1	381.9	328.9	279.0	236.8	162.7
25°	614.6	606.4	577.5	530.7	474.6	413.8	354.7	298.5	253.8	210.5	141.0
27.5°	578.0	568.3	540.0	499.3	445.2	382.4	325.3	272.3	226.5	185.3	121.0
30°	527.1	520.4	496.2	455.0	409.7	350.0	294.9	244.0	199.7	162.1	103.5
32.5°	472.5	463.3	443.7	410.2	367.5	314.5	262.5	214.1	173.0	139.5	87.0
35°	413.8	408.7	389.1	358.3	321.7	276.9	230.6	185.8	148.8	118.9	73.1
37.5°	353.1	346.9	334.6	309.9	281.0	240.9	198.2	159.6	126.6	100.4	60.7
40°	293.4	289.3	280.0	262.5	239.9	207.4	167.8	133.8	105.0	82.9	50.4
42.5°	240.4	239.4	233.7	220.8	202.3	173.0	143.1	111.2	87.0	67.9	40.7
45°	192.5	195.1	189.4	181.7	167.8	145.2	117.9	91.6	72.6	58.2	34.5
47.5°	153.9	151.8	151.3	148.2	136.4	117.9	94.7	75.7	62.8	49.4	29.9
50°	116.3	115.8	118.4	118.9	109.1	95.2	77.2	63.8	51.0	40.7	24.7
52.5°	85.4	86.5	90.6	93.7	87.5	75.2	63.8	51.0	42.2	34.0	21.1
55°	60.7	60.7	66.9	70.5	67.4	59.2	48.9	40.1	32.9	27.3	17.0
57.5°	38.1	39.6	45.8	50.4	49.4	44.3	36.5	30.4	26.3	22.6	14.9
60°	24.2	25.2	30.4	34.0	34.0	30.9	26.8	23.2	21.6	19.0	12.9
62.5°	15.4	17.0	20.1	23.2	23.7	20.6	18.0	18.0	17.0	14.9	10.8
65°	10.3	10.8	13.4	14.9	14.9	13.9	13.4	13.4	12.9	10.8	7.7
67.5°	6.7	7.2	8.8	9.8	9.3	8.2	9.3	9.8	9.3	8.2	6.2
70°	4.6	4.6	5.1	6.2	5.7	5.7	6.2	6.2	6.2	5.7	4.1
72.5°	3.1	3.1	3.1	3.1	3.1	3.1	3.6	4.1	4.1	4.1	2.6
75°	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.1	2.1	2.1	1.0
77.5°	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
80°	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	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	0.5	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):**

	135°	157.5°	180°
0°	390.2	390.2	390.2
2.5°	371.1	366.5	359.8
5°	335.1	320.7	313.5
7.5°	299.1	276.9	268.2
10°	261.5	236.8	227.5
12.5°	226.0	202.8	194.6
15°	195.1	174.0	167.3
17.5°	170.4	150.3	144.6
20°	145.2	127.1	121.5
22.5°	125.6	108.6	102.4
25°	106.5	91.1	87.5
27.5°	90.1	77.7	75.2
30°	76.2	67.4	65.4
32.5°	64.9	58.7	58.2
35°	55.1	51.0	51.5
37.5°	46.8	44.3	45.8
40°	39.1	39.1	40.1
42.5°	33.5	34.5	36.0
45°	27.8	30.4	31.4
47.5°	23.2	26.3	27.3
50°	20.1	22.6	23.7
52.5°	17.5	19.6	20.1
55°	14.9	17.0	17.0
57.5°	12.9	13.9	14.4
60°	10.8	11.8	11.8
62.5°	8.8	9.8	9.8
65°	7.2	7.7	7.7
67.5°	5.7	5.7	5.7
70°	4.1	4.1	3.6
72.5°	2.1	2.1	2.1
75°	1.0	0.5	0.5
77.5°	0.0	0.0	0.0
80°	0.0	0.0	0.0
82.5°	0.0	0.0	0.0
85°	0.0	0.0	0.0
87.5°	0.0	0.0	0.0
90°	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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Signify Classified - Internal  
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Peachtree City, GA 30269

Scaled Data Report





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

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Scaled Data Report



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