

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: P887081

Luminaire Tested: ML412LSFLD2W1E-TIR4D25AWW-TL4RWMB-600LM-3000K

Issue Date: 7/9/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P887081  
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-3000K  
Description: 4IN ROUND ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE BLACK TRIM  
Light Source: (1) D2W LED 90CRI / 3000K CCT  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 524.5 lumens  
Efficiency: N/A  
Efficacy: 55.8 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

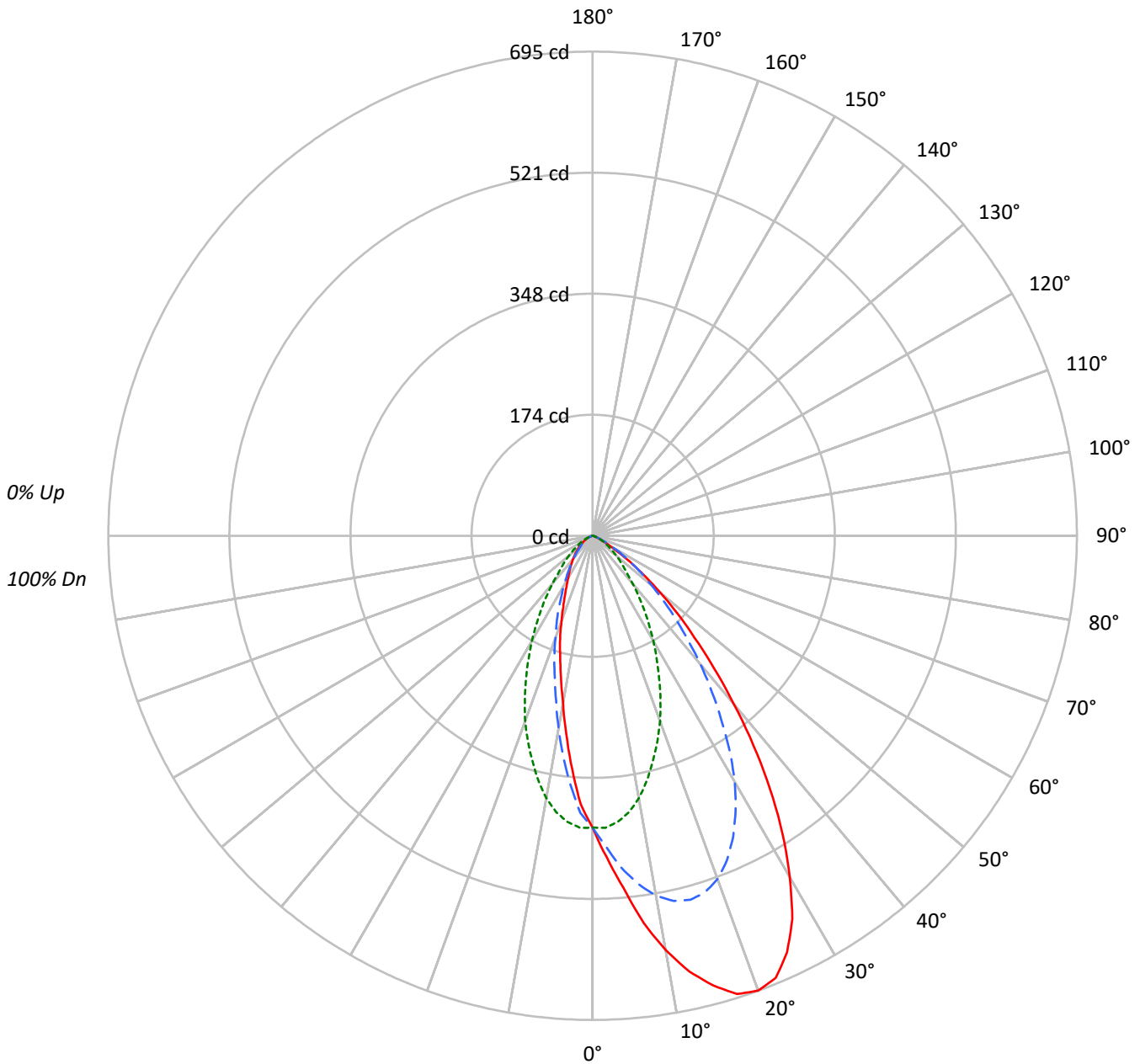
Input Watts (W): 9.4  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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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°	91857	91857	91857	91857	91857
5°	111666	105404	90755	79199	74092
10°	134511	116843	85146	62502	54397
15°	151692	122827	75914	47560	40772
20°	162111	122324	66039	36356	30429
25°	159662	115386	54681	27679	22743
30°	143288	103269	44083	20712	17775
35°	118936	86023	34184	15821	14803
40°	90169	68729	25476	12023	12337
45°	64100	52098	19382	9241	10451
50°	42608	37423	14908	7369	8665
55°	24926	25997	11202	6117	6958
60°	11403	15284	8947	5087	5570
65°	5759	8016	6019	3995	4307
70°	3206	3911	3911	2821	2500
75°	1440	1440	1864	932	508
80°	0	379	758	0	0
85°	0	0	0	0	0

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 10°  
 Vertical Angle: 45°  
 Luminance: 64968 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	39.5	7.5
10°-20°	106.1	20.2
20°-30°	136.6	26.0
30°-40°	118.4	22.6
40°-50°	74.3	14.2
50°-60°	35.6	6.8
60°-70°	12.0	2.3
70°-80°	2.0	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°	282.2	53.8
0°-40°	400.5	76.4
0°-60°	510.4	97.3
0°-90°	524.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	524.5	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	419	419	419	419	419	
5°	507	479	412	360	337	52
15°	668	541	334	210	180	189
25°	660	477	226	114	94	299
35°	444	321	128	59	55	275
45°	207	168	62	30	34	163
55°	65	68	29	16	18	60
65°	11	15	12	8	8	12
75°	2	2	2	1	1	2
85°	0	0	0	0	0	0
90°	0	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°	418.9	418.9	418.9	418.9	418.9	418.9	418.9	418.9	418.9	418.9	418.9
2.5°	462.0	456.5	457.6	454.8	450.4	443.8	439.4	432.7	426.7	419.5	406.8
5°	507.3	507.9	501.8	495.2	487.4	470.3	457.6	442.7	427.2	412.3	383.0
7.5°	560.4	557.1	549.3	532.8	515.6	493.0	470.3	446.5	423.3	400.1	355.9
10°	604.1	599.1	586.9	565.4	541.6	507.9	476.9	442.7	411.2	382.4	326.1
12.5°	640.5	636.1	619.5	590.8	557.1	516.7	475.3	433.8	395.1	359.8	292.9
15°	668.2	662.1	640.5	607.4	565.4	516.7	469.2	419.5	375.3	334.4	261.4
17.5°	689.7	680.3	652.7	614.0	563.7	509.5	454.3	401.8	352.6	308.9	230.5
20°	694.7	686.4	654.9	610.1	555.4	493.0	434.9	376.9	327.7	283.0	202.3
22.5°	687.0	674.2	645.5	596.9	536.6	471.4	410.1	353.1	299.5	254.2	174.6
25°	659.9	651.0	620.1	569.8	509.5	444.3	380.8	320.5	272.5	226.0	151.4
27.5°	620.6	610.1	579.7	536.1	478.0	410.6	349.3	292.4	243.2	199.0	129.9
30°	565.9	558.7	532.8	488.5	439.9	375.8	316.7	262.0	214.4	174.1	111.1
32.5°	507.3	497.4	476.4	440.5	394.6	337.7	281.9	229.9	185.7	149.8	93.4
35°	444.3	438.8	417.8	384.6	345.4	297.3	247.6	199.5	159.7	127.7	78.5
37.5°	379.1	372.5	359.2	332.7	301.7	258.6	212.8	171.3	136.0	107.8	65.2
40°	315.0	310.6	300.6	281.9	257.5	222.7	180.2	143.7	112.7	89.0	54.2
42.5°	258.1	257.0	250.9	237.1	217.2	185.7	153.6	119.4	93.4	73.0	43.7
45°	206.7	209.5	203.4	195.1	180.2	155.8	126.6	98.4	77.9	62.5	37.0
47.5°	165.2	163.0	162.5	159.2	146.5	126.6	101.7	81.2	67.4	53.1	32.1
50°	124.9	124.3	127.1	127.7	117.2	102.2	82.9	68.5	54.7	43.7	26.5
52.5°	91.7	92.8	97.3	100.6	94.0	80.7	68.5	54.7	45.3	36.5	22.7
55°	65.2	65.2	71.8	75.7	72.4	63.6	52.5	43.1	35.4	29.3	18.2
57.5°	40.9	42.6	49.2	54.2	53.1	47.5	39.2	32.6	28.2	24.3	16.0
60°	26.0	27.1	32.6	36.5	36.5	33.2	28.7	24.9	23.2	20.4	13.8
62.5°	16.6	18.2	21.6	24.9	25.4	22.1	19.3	19.3	18.2	16.0	11.6
65°	11.1	11.6	14.4	16.0	16.0	14.9	14.4	14.4	13.8	11.6	8.3
67.5°	7.2	7.7	9.4	10.5	9.9	8.8	9.9	10.5	9.9	8.8	6.6
70°	5.0	5.0	5.5	6.6	6.1	6.1	6.6	6.6	6.6	6.1	4.4
72.5°	3.3	3.3	3.3	3.3	3.3	3.3	3.9	4.4	4.4	4.4	2.8
75°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	2.2	2.2	2.2	1.1
77.5°	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
80°	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	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	0.6	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°	418.9	418.9	418.9
2.5°	398.5	393.5	386.3
5°	359.8	344.3	336.6
7.5°	321.1	297.3	287.9
10°	280.7	254.2	244.3
12.5°	242.6	217.7	208.9
15°	209.5	186.8	179.6
17.5°	182.9	161.4	155.3
20°	155.8	136.5	130.4
22.5°	134.8	116.6	110.0
25°	114.4	97.8	94.0
27.5°	96.7	83.5	80.7
30°	81.8	72.4	70.2
32.5°	69.6	63.0	62.5
35°	59.1	54.7	55.3
37.5°	50.3	47.5	49.2
40°	42.0	42.0	43.1
42.5°	35.9	37.0	38.7
45°	29.8	32.6	33.7
47.5°	24.9	28.2	29.3
50°	21.6	24.3	25.4
52.5°	18.8	21.0	21.6
55°	16.0	18.2	18.2
57.5°	13.8	14.9	15.5
60°	11.6	12.7	12.7
62.5°	9.4	10.5	10.5
65°	7.7	8.3	8.3
67.5°	6.1	6.1	6.1
70°	4.4	4.4	3.9
72.5°	2.2	2.2	2.2
75°	1.1	0.6	0.6
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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Scaled Data Report





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

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Scaled Data Report



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