

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: P886969

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4SWMB-1200LM-5000K

Issue Date: 7/10/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886969  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-59)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 7/10/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML412LSFL9FS1E-TIR4D25AWW-TL4SWMB-1200LM-5000K  
Description: 4IN SQUARE ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE BLACK TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 5000K CCT  
Ballast/Driver: -

**Summary**

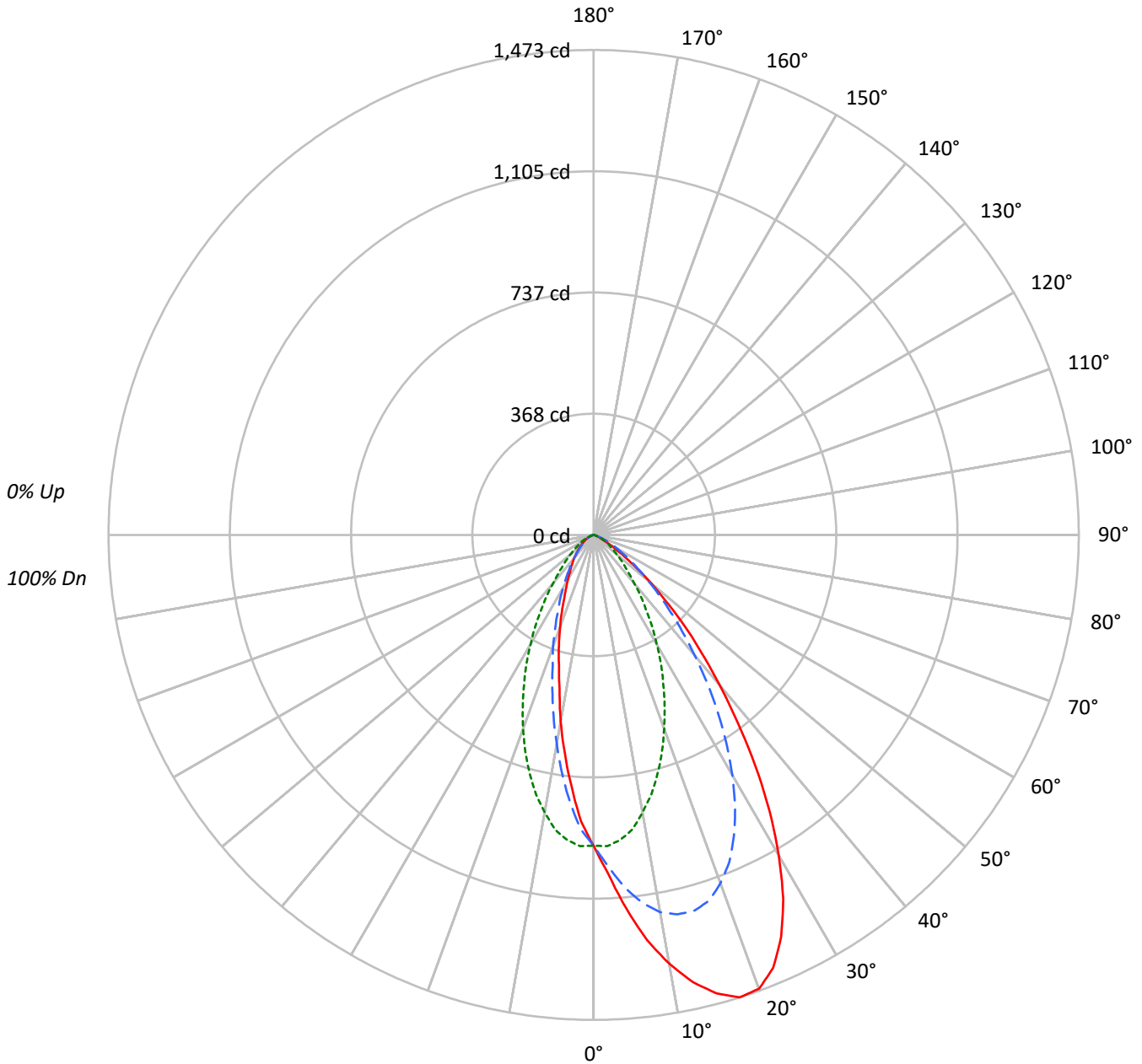
Lumens per Lamp: N/A  
Luminaire Lumens: 1109.8 lumens  
Efficiency: N/A  
Efficacy: 63.1 lumens/watt  
Spacing Criteria (0/90/45): 1.08 / 0.79 / 0.96  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

Input Watts (W): 17.6  
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	113	109	107	104	110	107	105	102	103	101	99	99	98	96	96	95	93	92		
2	106	100	95	92	104	98	94	91	95	92	89	92	89	87	89	87	85	83		
3	99	92	86	82	97	90	85	81	88	83	79	85	81	78	83	80	77	75		
4	93	85	78	73	91	83	77	73	81	76	72	79	75	71	77	73	70	68		
5	88	78	71	66	86	77	71	66	75	70	65	73	69	65	72	68	64	63		
6	82	72	65	60	81	71	65	60	70	64	60	68	63	59	67	62	59	57		
7	78	67	60	56	76	66	60	55	65	59	55	64	59	55	63	58	54	53		
8	73	63	56	51	72	62	56	51	61	55	51	60	54	51	59	54	50	49		
9	69	59	52	47	68	58	52	47	57	51	47	56	51	47	55	50	47	45		
10	66	55	48	44	65	54	48	44	54	48	44	53	48	44	52	47	44	42		

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

	0°	45°	90°	135°	180°
0°	91431	91431	91431	91431	91431
5°	110821	104471	90419	79430	74675
10°	130094	114448	84136	63498	56622
15°	144552	118496	75260	48612	40899
20°	151237	116103	64505	37113	30753
25°	143981	107793	53434	27396	22415
30°	125644	94171	42877	20728	17462
35°	101150	77722	32794	15433	14050
40°	75005	60196	24319	11647	11647
45°	53472	45094	18194	8782	9412
50°	34061	32403	13700	6842	7897
55°	18900	22734	10624	5709	6300
60°	8796	15684	8583	4514	4960
65°	4814	10281	5868	4011	4011
70°	2634	5608	3965	3314	2634
75°	1310	2620	1759	1759	449
80°	0	669	669	0	0
85°	0	0	0	0	0

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 53472 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	88.9	8.0
10°-20°	234.3	21.1
20°-30°	291.5	26.3
30°-40°	242.8	21.9
40°-50°	147.6	13.3
50°-60°	71.1	6.4
60°-70°	27.5	2.5
70°-80°	6.0	0.5
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°	614.7	55.4
0°-40°	857.5	77.3
0°-60°	1076.3	97.0
0°-90°	1109.8	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1109.8	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	944	944	944	944	944	
5°	1140	1074	930	817	768	114
15°	1441	1182	750	485	408	406
25°	1347	1008	500	256	210	610
35°	855	657	277	130	119	531
45°	390	329	133	64	69	302
55°	112	135	63	34	37	106
65°	21	45	26	18	18	23
75°	4	7	5	5	1	4
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°	943.8	943.8	943.8	943.8	943.8	943.8	943.8	943.8	943.8	943.8	943.8
2.5°	1031.2	1032.4	1032.4	1020.7	1013.7	1000.9	988.1	975.3	957.8	946.1	918.2
5°	1139.6	1132.6	1126.7	1110.4	1088.3	1060.3	1027.7	993.9	961.3	929.8	863.4
7.5°	1240.9	1231.6	1218.8	1185.0	1148.9	1103.4	1052.2	998.6	946.1	901.9	808.6
10°	1322.5	1313.2	1288.7	1249.1	1194.3	1132.6	1060.3	991.6	924.0	855.3	739.9
12.5°	1391.2	1377.3	1348.1	1294.5	1220.0	1140.7	1054.5	969.4	883.2	807.5	665.3
15°	1441.3	1423.9	1386.6	1316.7	1229.3	1133.7	1031.2	933.3	836.6	750.4	596.6
17.5°	1472.8	1451.8	1400.6	1321.3	1220.0	1109.3	995.1	883.2	786.5	689.8	530.2
20°	1467.0	1441.3	1388.9	1300.4	1186.2	1066.2	945.0	831.9	721.3	625.7	462.6
22.5°	1423.9	1402.9	1345.8	1256.1	1139.6	1011.4	887.9	770.2	661.8	562.8	400.8
25°	1347.0	1328.3	1274.7	1186.2	1073.1	943.8	814.5	700.3	594.2	499.9	344.9
27.5°	1246.8	1231.6	1175.7	1095.3	990.4	870.4	743.4	633.9	530.2	442.8	294.8
30°	1123.2	1109.3	1059.2	992.7	897.2	786.5	671.2	566.3	467.2	383.3	248.2
32.5°	993.9	977.6	946.1	876.2	801.7	698.0	597.7	495.2	402.0	329.8	209.7
35°	855.3	840.1	815.6	762.0	700.3	614.1	520.8	427.6	344.9	277.3	174.8
37.5°	716.6	713.1	692.1	654.8	600.1	529.0	442.8	365.9	291.3	234.2	144.5
40°	593.1	594.2	575.6	548.8	505.7	446.3	381.0	306.4	242.4	192.3	118.8
42.5°	483.6	483.6	470.7	453.3	424.1	374.0	318.1	256.3	199.2	157.3	96.7
45°	390.3	377.5	379.9	368.2	348.4	309.9	257.5	202.7	165.5	132.8	80.4
47.5°	294.8	299.5	303.0	301.8	284.3	251.7	208.6	169.0	141.0	111.9	68.7
50°	226.0	226.0	233.0	237.7	228.4	201.6	167.8	141.0	114.2	90.9	57.1
52.5°	159.6	166.6	177.1	189.9	180.6	162.0	139.8	113.0	95.5	75.7	47.8
55°	111.9	115.4	130.5	144.5	141.0	128.2	109.5	92.1	75.7	62.9	39.6
57.5°	71.1	73.4	93.2	108.4	109.5	101.4	87.4	73.4	61.8	53.6	33.8
60°	45.4	50.1	61.8	79.2	82.7	79.2	68.7	58.3	52.4	44.3	29.1
62.5°	30.3	33.8	43.1	53.6	61.8	61.8	51.3	47.8	40.8	35.0	25.6
65°	21.0	23.3	29.1	37.3	45.4	44.3	40.8	36.1	31.5	25.6	19.8
67.5°	14.0	16.3	19.8	25.6	30.3	31.5	29.1	25.6	22.1	19.8	15.1
70°	9.3	10.5	12.8	17.5	19.8	19.8	19.8	17.5	15.1	14.0	10.5
72.5°	5.8	7.0	8.2	10.5	11.7	12.8	11.7	11.7	10.5	9.3	7.0
75°	3.5	4.7	4.7	5.8	7.0	7.0	7.0	5.8	5.8	4.7	4.7
77.5°	2.3	2.3	2.3	2.3	2.3	3.5	3.5	2.3	2.3	1.2	2.3
80°	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
82.5°	0.0	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



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**CANDELA DISTRIBUTION (continued):**

	135°	157.5°	180°
0°	943.8	943.8	943.8
2.5°	894.9	882.1	871.6
5°	816.8	784.2	767.9
7.5°	732.9	686.3	670.0
10°	645.5	587.3	575.6
12.5°	562.8	503.4	477.7
15°	484.7	425.3	407.8
17.5°	413.6	365.9	350.7
20°	360.0	314.6	298.3
22.5°	305.3	263.3	251.7
25°	256.3	222.6	209.7
27.5°	220.2	187.6	180.6
30°	185.3	159.6	156.1
32.5°	156.1	137.5	134.0
35°	130.5	117.7	118.8
37.5°	110.7	101.4	103.7
40°	92.1	88.6	92.1
42.5°	76.9	78.1	80.4
45°	64.1	68.7	68.7
47.5°	53.6	59.4	60.6
50°	45.4	51.3	52.4
52.5°	39.6	44.3	44.3
55°	33.8	37.3	37.3
57.5°	29.1	31.5	31.5
60°	23.3	25.6	25.6
62.5°	19.8	21.0	21.0
65°	17.5	17.5	17.5
67.5°	14.0	14.0	12.8
70°	11.7	10.5	9.3
72.5°	8.2	7.0	4.7
75°	4.7	3.5	1.2
77.5°	1.2	1.2	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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Scaled Data Report





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

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