

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: P886977

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4SWSL-1200LM-3500K

Issue Date: 7/10/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886977  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-58)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 7/10/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML412LSFL9FS1E-TIR4D25AWW-TL4\$WSL-1200LM-3500K  
Description: 4IN SQUARE ML FLEX, SELECTABLE CCT, WITH WW TIR, METALLIC SILVER TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 3500K CCT  
Ballast/Driver: -

**Summary**

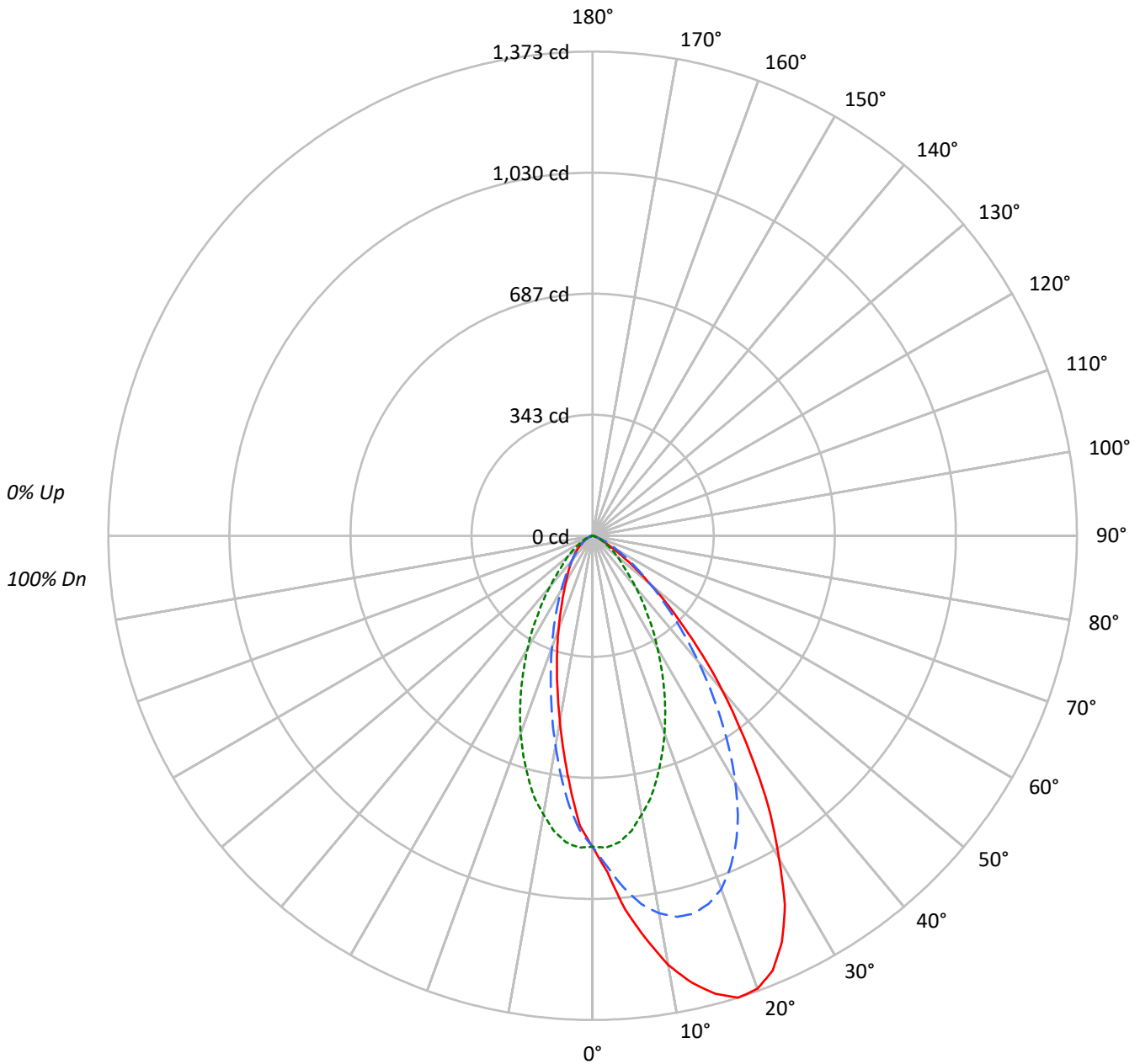
Lumens per Lamp: N/A  
Luminaire Lumens: 1061.7 lumens  
Efficiency: N/A  
Efficacy: 60.3 lumens/watt  
Spacing Criteria (0/90/45): 1.08 / 0.8 / 0.97  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

Input Watts (W): 17.6  
Input Voltage (V): NR  
Input Current (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					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					100			
1	113	109	106	104	110	107	105	102	103	101	99	99	98	96	96	95	93	91					91			
2	106	100	95	91	103	98	94	90	95	91	88	92	89	86	89	87	85	83					83			
3	99	92	86	81	97	90	85	81	88	83	79	85	81	78	83	79	77	75					75			
4	93	84	78	73	91	83	77	72	81	76	72	79	74	71	77	73	70	68					68			
5	87	78	71	66	86	77	70	66	75	69	65	73	68	64	71	67	64	62					62			
6	82	72	65	60	81	71	65	60	70	64	59	68	63	59	67	62	59	57					57			
7	77	67	60	55	76	66	60	55	65	59	55	63	58	54	62	58	54	52					52			
8	73	62	55	51	72	62	55	51	60	55	50	59	54	50	58	54	50	48					48			
9	69	58	52	47	68	58	51	47	57	51	47	56	50	47	55	50	46	45					45			
10	65	55	48	44	64	54	48	44	53	47	44	52	47	43	52	47	43	42					42			

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

	0°	45°	90°	135°	180°
0°	85434	85434	85434	85434	85434
5°	103489	97318	84827	74558	69890
10°	121575	106938	78883	59474	52549
15°	134854	111220	71007	45663	39144
20°	140928	109876	61454	34742	29134
25°	135751	102807	51179	26445	21656
30°	118205	90592	41154	19923	16824
35°	95710	74843	31777	14877	13872
40°	72286	58994	23863	11457	11331
45°	49965	44409	17235	8768	9494
50°	31815	32222	13820	6752	7716
55°	18190	22337	10269	5759	6300
60°	9087	15394	7653	4960	4960
65°	5135	10143	6120	4149	3920
70°	3031	5594	3937	3314	2719
75°	1984	2807	2396	1984	786
80°	614	1172	614	0	0
85°	0	0	1223	0	0

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 10°  
 Vertical Angle: 45°  
 Luminance: 50403 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	83.1	7.8
10°-20°	220.4	20.8
20°-30°	277.0	26.1
30°-40°	233.9	22.0
40°-50°	143.5	13.5
50°-60°	69.8	6.6
60°-70°	27.3	2.6
70°-80°	6.7	0.6
80°-90°	0.2	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°	580.4	54.7
0°-40°	814.4	76.7
0°-60°	1027.6	96.8
0°-90°	1061.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1061.7	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	882	882	882	882	882	
5°	1064	1001	872	767	719	106
15°	1345	1109	708	455	390	379
25°	1270	962	479	247	203	574
35°	809	633	269	126	117	504
45°	365	324	126	64	69	288
55°	108	132	61	34	37	102
65°	22	44	27	18	17	24
75°	5	8	6	5	2	6
85°	0	0	1	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°	881.9	881.9	881.9	881.9	881.9	881.9	881.9	881.9	881.9	881.9	881.9
2.5°	953.3	961.8	955.4	955.4	942.6	934.1	921.3	910.6	898.9	885.0	858.4
5°	1064.2	1057.8	1046.1	1034.3	1013.0	988.5	961.8	929.8	902.1	872.3	811.5
7.5°	1151.6	1147.4	1134.6	1109.0	1074.9	1031.1	985.3	937.3	890.4	843.5	758.2
10°	1235.9	1224.1	1204.9	1165.5	1116.4	1057.8	993.8	930.9	865.9	801.9	696.3
12.5°	1297.7	1284.9	1257.2	1207.1	1145.2	1068.5	989.5	911.7	829.6	761.4	630.2
15°	1344.6	1335.0	1295.6	1234.8	1154.8	1063.1	971.4	879.7	790.1	708.0	563.0
17.5°	1373.4	1358.5	1312.6	1238.0	1145.2	1042.9	939.4	839.2	744.3	652.6	499.0
20°	1367.0	1353.2	1305.2	1222.0	1120.7	1010.9	897.8	786.9	686.7	596.1	438.3
22.5°	1334.0	1323.3	1270.0	1181.5	1077.0	960.8	844.5	730.4	628.1	537.4	380.7
25°	1270.0	1252.9	1201.7	1123.9	1021.5	902.1	779.5	671.8	567.3	478.8	325.2
27.5°	1180.4	1159.1	1114.3	1045.0	946.9	837.1	714.4	605.7	508.6	421.2	279.4
30°	1056.7	1050.3	1005.5	952.2	860.5	759.2	649.4	538.5	447.9	367.9	237.8
32.5°	939.4	926.6	895.7	841.3	769.9	677.1	574.7	479.8	395.6	319.9	201.5
35°	809.3	804.0	773.1	737.9	673.9	591.8	505.4	420.1	337.0	268.7	170.6
37.5°	683.5	682.4	656.9	636.6	579.0	516.1	434.0	354.0	286.8	228.2	140.8
40°	571.6	565.2	550.2	527.8	492.6	440.4	367.9	297.5	238.9	188.7	116.2
42.5°	462.8	459.6	452.1	438.3	410.5	367.9	310.3	248.5	195.1	154.6	94.9
45°	364.7	367.9	367.9	359.4	341.2	307.1	255.9	202.6	158.9	125.8	77.8
47.5°	286.8	284.7	289.0	286.8	279.4	250.6	206.9	162.1	133.3	107.7	66.1
50°	211.1	218.6	222.9	231.4	225.0	202.6	164.2	134.4	112.0	91.7	56.5
52.5°	155.7	158.9	169.5	185.5	181.3	159.9	132.2	113.0	92.8	75.7	48.0
55°	107.7	110.9	126.9	141.8	139.7	124.8	107.7	91.7	74.6	60.8	39.5
57.5°	70.4	73.6	87.4	108.8	108.8	99.2	87.4	72.5	58.6	48.0	33.1
60°	46.9	49.1	60.8	76.8	80.0	78.9	69.3	54.4	45.9	39.5	27.7
62.5°	30.9	33.1	42.7	54.4	60.8	60.8	51.2	41.6	37.3	33.1	23.5
65°	22.4	23.5	29.9	36.3	43.7	44.8	37.3	33.1	29.9	26.7	20.3
67.5°	16.0	16.0	21.3	25.6	30.9	29.9	27.7	24.5	22.4	19.2	16.0
70°	10.7	11.7	13.9	17.1	20.3	19.2	19.2	18.1	16.0	13.9	11.7
72.5°	7.5	8.5	9.6	11.7	12.8	12.8	12.8	11.7	10.7	9.6	8.5
75°	5.3	5.3	5.3	6.4	7.5	7.5	8.5	7.5	6.4	6.4	5.3
77.5°	3.2	3.2	3.2	3.2	4.3	4.3	4.3	3.2	3.2	2.1	3.2
80°	1.1	1.1	1.1	2.1	2.1	2.1	2.1	1.1	1.1	1.1	1.1
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.1	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°	881.9	881.9	881.9
2.5°	836.0	823.2	822.1
5°	766.7	735.8	718.7
7.5°	685.6	641.9	621.7
10°	604.6	552.4	534.2
12.5°	528.9	473.4	456.4
15°	455.3	402.0	390.3
17.5°	393.5	344.4	332.7
20°	337.0	295.4	282.6
22.5°	290.0	250.6	237.8
25°	247.4	213.3	202.6
27.5°	211.1	181.3	174.9
30°	178.1	154.6	150.4
32.5°	149.3	133.3	132.2
35°	125.8	114.1	117.3
37.5°	108.8	99.2	102.4
40°	90.6	86.4	89.6
42.5°	76.8	74.6	78.9
45°	64.0	66.1	69.3
47.5°	54.4	58.6	60.8
50°	44.8	51.2	51.2
52.5°	38.4	44.8	43.7
55°	34.1	38.4	37.3
57.5°	29.9	32.0	30.9
60°	25.6	26.7	25.6
62.5°	21.3	22.4	21.3
65°	18.1	18.1	17.1
67.5°	14.9	13.9	13.9
70°	11.7	10.7	9.6
72.5°	8.5	7.5	5.3
75°	5.3	4.3	2.1
77.5°	2.1	1.1	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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