

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: P886972

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4SWMW-1200LM-3500K

Issue Date: 7/10/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886972  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-57)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 7/10/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML412LSFL9FS1E-TIR4D25AWW-TL4SWMW-1200LM-3500K  
Description: 4IN SQUARE ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE WHITE TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 3500K CCT  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1073.7 lumens  
Efficiency: N/A  
Efficacy: 61.0 lumens/watt  
Spacing Criteria (0/90/45): 1.12 / 0.8 / 0.99  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

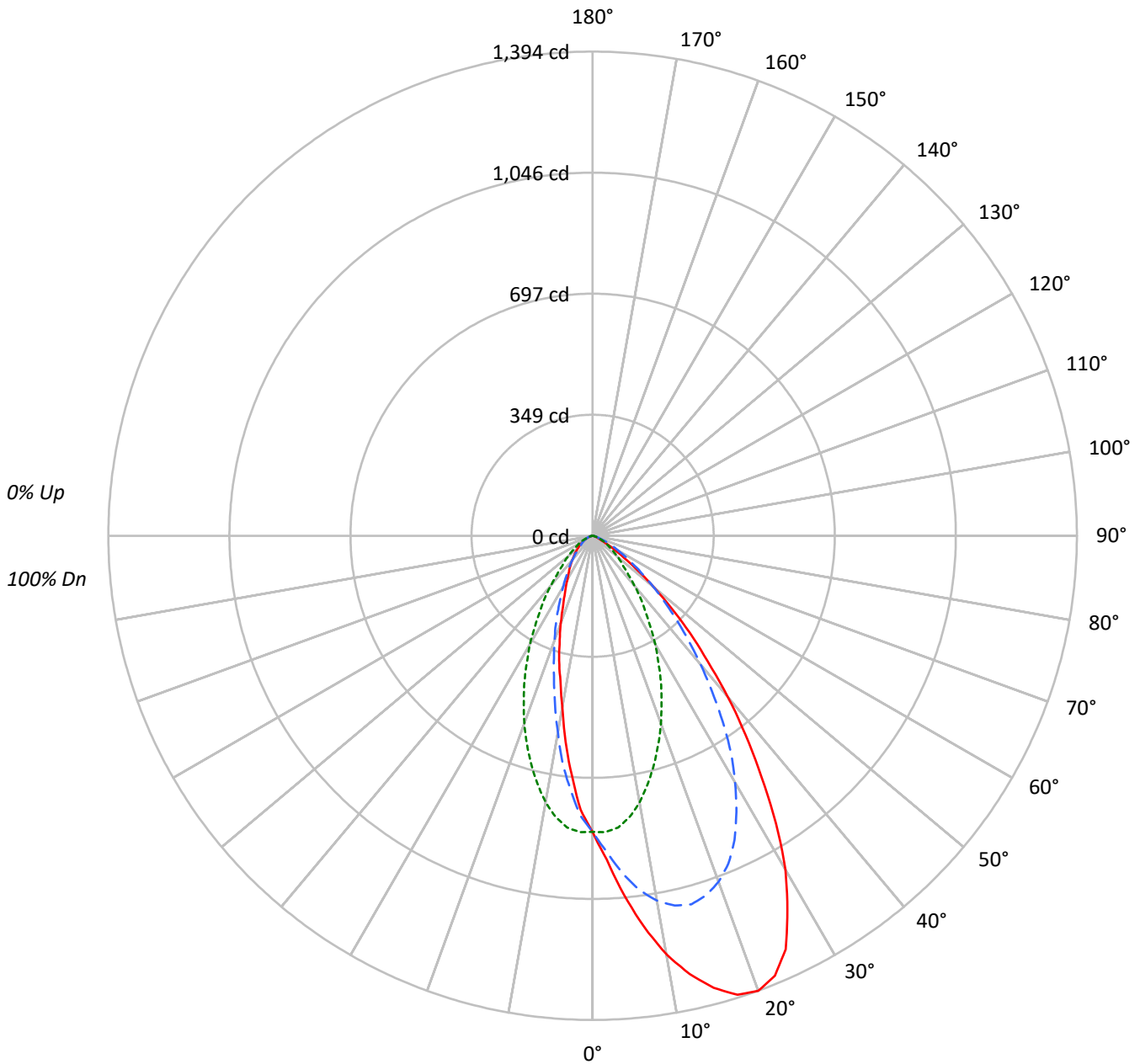
Input Watts (W): 17.6  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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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					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	112	109	106	104	110	107	104	102	103	101	99	99	97	96	96	94	93	91								
2	105	100	95	91	103	98	93	90	95	91	88	91	88	86	89	86	84	82								
3	99	91	85	81	97	90	84	80	87	82	79	84	81	77	82	79	76	74								
4	93	84	77	72	91	82	76	72	80	75	71	78	74	70	76	72	69	67								
5	87	77	70	65	85	76	70	65	74	69	64	72	68	64	71	66	63	61								
6	82	71	64	59	80	70	64	59	69	63	59	67	62	58	66	61	58	56								
7	77	66	59	54	75	65	59	54	64	58	54	63	57	53	62	57	53	52								
8	73	62	55	50	71	61	54	50	60	54	50	59	53	49	58	53	49	48								
9	69	57	51	46	67	57	50	46	56	50	46	55	50	46	54	49	46	44								
10	65	54	47	43	64	53	47	43	53	47	43	52	46	43	51	46	42	41								

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

	0°	45°	90°	135°	180°
0°	82606	82606	82606	82606	82606
5°	100951	94737	81988	71310	67167
10°	120365	104951	76640	56622	49283
15°	135114	110157	68410	42975	37309
20°	143722	109278	59227	32969	27577
25°	140475	103336	49672	25066	20512
30°	124122	91744	40304	18961	16220
35°	100216	77143	31139	14499	13612
40°	76560	61062	23585	11318	11457
45°	54322	46581	17235	8905	9782
50°	34377	34136	13820	7068	8199
55°	18714	23950	10978	6300	7026
60°	8680	16517	8874	5774	5987
65°	4653	10877	6831	4883	4653
70°	3031	6189	5127	4532	3314
75°	1984	3387	3593	2807	1609
80°	614	1785	1172	1785	1172
85°	0	1223	1223	1223	1223

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 54322 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	80.5	7.5
10°-20°	215.5	20.1
20°-30°	275.9	25.7
30°-40°	238.1	22.2
40°-50°	149.4	13.9
50°-60°	74.0	6.9
60°-70°	30.0	2.8
70°-80°	9.0	0.8
80°-90°	1.2	0.1
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°	572.0	53.3
0°-40°	810.1	75.5
0°-60°	1033.5	96.3
0°-90°	1073.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1073.7	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	853	853	853	853	853	
5°	1038	974	843	733	691	105
15°	1347	1098	682	428	372	381
25°	1314	967	465	234	192	592
35°	847	652	263	123	115	529
45°	396	340	126	65	71	307
55°	111	142	65	37	42	106
65°	20	47	30	21	20	23
75°	5	9	10	8	4	6
85°	0	1	1	1	1	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°	852.7	852.7	852.7	852.7	852.7	852.7	852.7	852.7	852.7	852.7	852.7
2.5°	933.7	939.0	925.2	925.2	914.5	904.9	895.3	880.4	867.6	853.8	827.1
5°	1038.1	1033.9	1021.1	1010.4	989.1	959.3	934.8	903.8	870.8	843.1	781.3
7.5°	1136.2	1130.9	1108.5	1086.1	1050.9	1005.1	959.3	909.2	859.1	816.4	725.9
10°	1223.6	1215.1	1188.4	1146.9	1097.8	1036.0	971.0	900.7	836.7	779.1	665.1
12.5°	1292.9	1281.2	1250.3	1195.9	1129.8	1050.9	969.9	883.6	803.7	732.2	600.1
15°	1347.2	1336.6	1292.9	1228.9	1144.7	1052.0	952.9	857.0	763.2	682.1	537.2
17.5°	1385.6	1370.7	1316.3	1238.5	1139.4	1031.8	924.1	816.4	717.3	628.9	477.5
20°	1394.1	1375.0	1316.3	1230.0	1119.2	1000.8	885.7	768.5	665.1	574.5	417.8
22.5°	1370.7	1350.4	1290.8	1198.0	1086.1	957.1	834.6	713.1	608.6	518.0	362.4
25°	1314.2	1291.8	1235.3	1145.8	1031.8	901.7	772.7	661.9	557.4	464.7	310.2
27.5°	1214.0	1203.4	1152.2	1068.0	959.3	833.5	706.7	599.0	494.6	409.3	266.5
30°	1109.6	1098.9	1055.2	981.7	879.3	761.0	644.8	536.1	438.1	360.3	227.0
32.5°	982.7	969.9	939.0	875.1	793.0	689.6	573.4	473.2	384.8	308.0	195.1
35°	847.4	847.4	820.7	770.6	699.2	605.4	505.2	412.5	331.5	263.3	162.0
37.5°	722.7	725.9	703.5	657.6	600.1	526.5	434.9	351.7	281.4	226.0	136.4
40°	605.4	597.9	586.2	559.6	512.7	453.0	372.0	300.6	237.7	186.5	114.0
42.5°	489.2	494.6	480.7	465.8	432.7	382.6	317.6	253.7	195.1	152.4	93.8
45°	396.5	394.4	390.1	379.4	362.4	317.6	263.3	204.6	159.9	125.8	77.8
47.5°	304.8	308.0	307.0	307.0	295.2	263.3	215.3	165.2	134.3	109.8	67.1
50°	228.1	236.6	242.0	246.2	238.8	214.2	167.3	136.4	114.0	91.7	57.6
52.5°	164.1	168.4	183.3	200.4	192.9	168.4	137.5	114.0	93.8	76.7	49.0
55°	110.8	119.4	135.4	152.4	151.4	132.2	111.9	92.7	78.9	65.0	41.6
57.5°	70.3	74.6	93.8	114.0	114.0	104.5	89.5	77.8	61.8	52.2	35.2
60°	44.8	48.0	61.8	81.0	87.4	83.1	72.5	58.6	52.2	45.8	32.0
62.5°	29.8	30.9	41.6	55.4	64.0	64.0	54.4	48.0	42.6	37.3	27.7
65°	20.3	21.3	27.7	37.3	46.9	48.0	41.6	37.3	34.1	29.8	23.4
67.5°	13.9	14.9	19.2	25.6	30.9	33.0	32.0	29.8	26.6	22.4	18.1
70°	10.7	10.7	12.8	17.1	21.3	22.4	22.4	22.4	20.3	18.1	14.9
72.5°	7.5	8.5	8.5	11.7	13.9	14.9	16.0	16.0	14.9	13.9	11.7
75°	5.3	5.3	6.4	7.5	8.5	9.6	10.7	10.7	10.7	9.6	8.5
77.5°	3.2	3.2	4.3	4.3	5.3	6.4	6.4	6.4	5.3	5.3	5.3
80°	1.1	1.1	2.1	2.1	3.2	3.2	3.2	3.2	2.1	2.1	3.2
82.5°	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	2.1
85°	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
87.5°	0.0	0.0	0.0	0.0	0.0	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):**

	135°	157.5°	180°
0°	852.7	852.7	852.7
2.5°	806.9	791.9	789.8
5°	733.3	708.8	690.7
7.5°	660.8	612.9	597.9
10°	575.6	524.4	501.0
12.5°	499.9	445.5	427.4
15°	428.5	381.6	372.0
17.5°	370.9	328.3	314.4
20°	319.8	279.3	267.5
22.5°	277.1	236.6	223.8
25°	234.5	201.4	191.9
27.5°	199.3	171.6	166.3
30°	169.5	147.1	145.0
32.5°	145.0	127.9	129.0
35°	122.6	111.9	115.1
37.5°	106.6	99.1	102.3
40°	89.5	87.4	90.6
42.5°	76.7	77.8	81.0
45°	65.0	69.3	71.4
47.5°	55.4	61.8	62.9
50°	46.9	54.4	54.4
52.5°	41.6	48.0	48.0
55°	37.3	41.6	41.6
57.5°	34.1	36.2	36.2
60°	29.8	29.8	30.9
62.5°	24.5	25.6	25.6
65°	21.3	21.3	20.3
67.5°	18.1	18.1	16.0
70°	16.0	14.9	11.7
72.5°	11.7	10.7	7.5
75°	7.5	6.4	4.3
77.5°	4.3	3.2	2.1
80°	3.2	2.1	2.1
82.5°	2.1	2.1	1.1
85°	1.1	1.1	1.1
87.5°	1.1	1.1	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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