

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: P886959

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMW-1200LM-5000K

Issue Date: 7/9/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886959  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-45)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 7/9/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML412LSFL9FS1E-TIR4D25AWW-TL4RMMW-1200LM-5000K  
Description: 4IN ROUND ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE WHITE TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 5000K CCT  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1174.4 lumens  
Efficiency: N/A  
Efficacy: 66.7 lumens/watt  
Spacing Criteria (0/90/45): 1.16 / 0.81 / 1.01  
Luminous Opening: Circular (Dia: 0.25' x H: 0')  
CIE Type: Direct

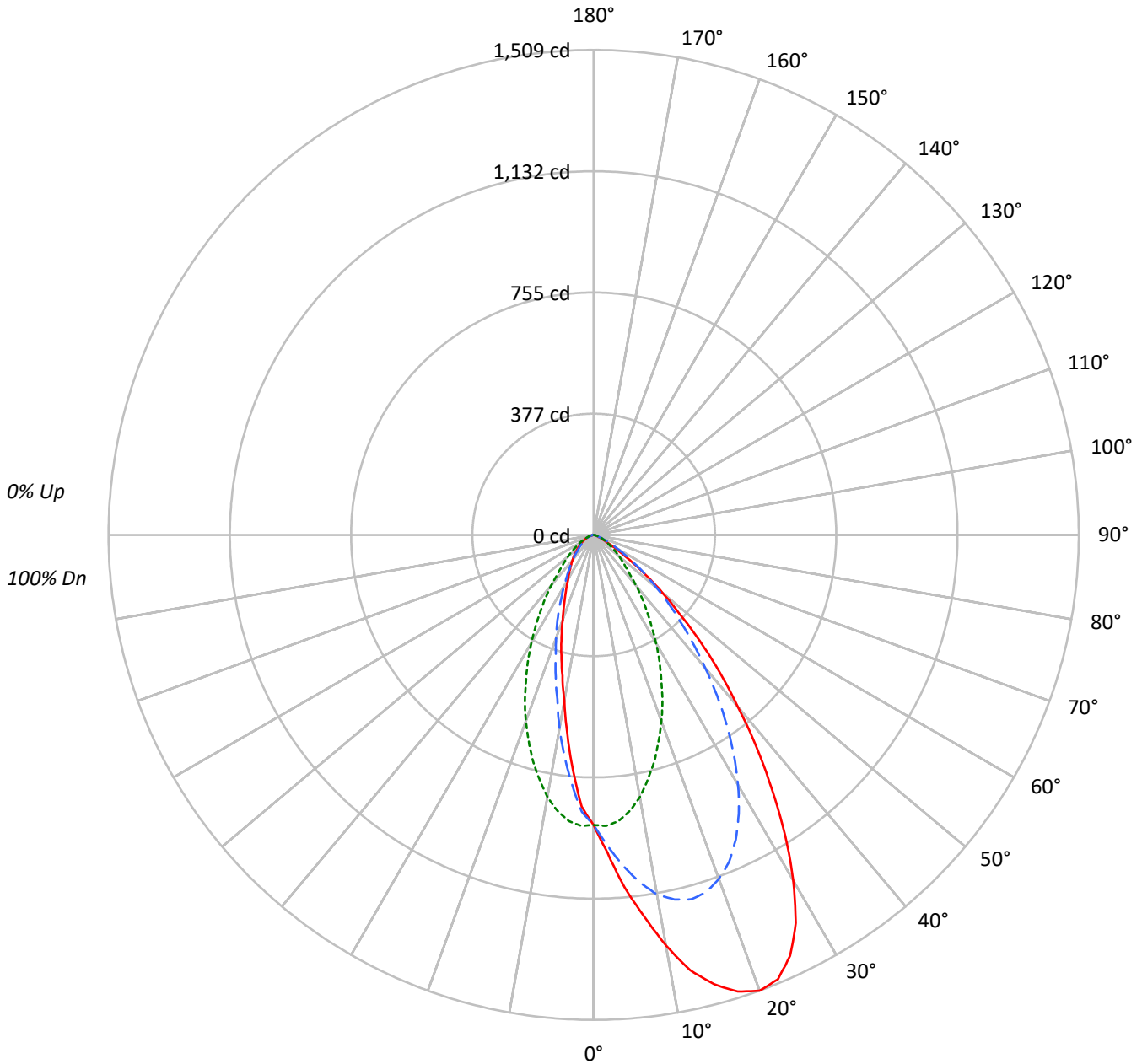
Input Watts (W): 17.6  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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### Luminous Intensity Polar Plot





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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

RF	20				20				20				20				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	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	103	110	107	104	102	103	101	99	99	97	96	96	94	93	91			
2	105	100	95	91	103	98	93	90	94	91	88	91	88	86	89	86	84	82			
3	99	91	85	80	97	90	84	80	87	82	78	84	80	77	82	79	76	74			
4	92	83	77	72	91	82	76	71	80	75	71	78	73	70	76	72	69	67			
5	87	77	70	65	85	76	69	65	74	68	64	72	67	63	70	66	63	61			
6	81	71	64	59	80	70	63	59	69	63	58	67	62	58	66	61	57	56			
7	77	66	59	54	75	65	58	54	64	58	53	62	57	53	61	56	53	51			
8	72	61	54	49	71	61	54	49	59	53	49	58	53	49	57	52	49	47			
9	68	57	50	46	67	57	50	46	56	50	45	55	49	45	54	49	45	44			
10	65	53	47	42	63	53	47	42	52	46	42	51	46	42	50	45	42	40			

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

	0°	45°	90°	135°	180°
0°	197923	197923	197923	197923	197923
5°	242262	227129	196632	171252	162029
10°	288884	252979	184388	136136	117210
15°	328651	266506	165517	103633	88037
20°	352224	265801	143769	79620	65759
25°	349690	253043	120321	61431	50446
30°	314656	227503	97914	46311	40107
35°	258778	192832	76694	36165	33970
40°	199688	154346	58681	28339	29341
45°	144821	118105	43353	22762	25274
50°	94973	87212	34967	18660	21867
55°	52987	60328	27144	16477	18695
60°	23989	37037	21972	14823	16358
65°	12089	19639	17538	12712	13283
70°	7437	11220	12694	10450	9681
75°	4914	6439	9828	6947	4914
80°	1515	2904	4420	4420	4420
85°	0	3019	5787	5787	5787

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 144821 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	85.4	7.3
10°-20°	230.1	19.6
20°-30°	299.7	25.5
30°-40°	263.8	22.5
40°-50°	168.9	14.4
50°-60°	83.9	7.1
60°-70°	31.6	2.7
70°-80°	9.3	0.8
80°-90°	1.7	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°	615.2	52.4
0°-40°	879.0	74.8
0°-60°	1131.8	96.4
0°-90°	1174.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1174.4	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	903	903	903	903	903	
5°	1101	1032	893	778	736	111
15°	1448	1174	729	456	388	409
25°	1445	1046	497	254	208	654
35°	967	720	286	135	127	602
45°	467	381	140	73	82	362
55°	139	158	71	43	49	132
65°	23	38	34	24	26	26
75°	6	8	12	8	6	6
85°	0	1	2	2	2	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°	902.6	902.6	902.6	902.6	902.6	902.6	902.6	902.6	902.6	902.6	902.6
2.5°	990.0	992.3	984.1	976.0	971.3	960.8	948.0	929.4	920.1	906.1	880.5
5°	1100.6	1100.6	1092.4	1068.0	1047.0	1016.7	991.1	957.3	924.7	893.3	832.7
7.5°	1196.1	1196.1	1179.8	1156.5	1113.4	1065.7	1017.9	963.2	913.1	865.3	773.3
10°	1297.4	1291.6	1269.5	1226.4	1167.0	1105.3	1030.7	957.3	892.1	828.1	705.8
12.5°	1387.1	1372.0	1337.0	1281.1	1204.2	1119.2	1031.9	939.9	856.0	779.2	635.9
15°	1447.7	1434.8	1388.3	1317.2	1225.2	1122.7	1017.9	910.8	814.1	729.1	570.7
17.5°	1489.6	1476.8	1416.2	1331.2	1224.0	1106.4	988.8	872.3	766.3	672.0	503.1
20°	1509.4	1491.9	1429.0	1327.7	1203.1	1075.0	945.7	821.1	712.8	616.1	442.6
22.5°	1496.6	1475.6	1403.4	1302.1	1171.6	1030.7	896.8	771.0	653.4	559.0	384.3
25°	1445.3	1431.4	1355.7	1246.2	1118.1	973.6	833.9	706.9	592.8	497.3	333.1
27.5°	1361.5	1337.0	1269.5	1177.5	1048.2	907.3	766.3	644.1	535.7	442.6	286.5
30°	1242.7	1221.7	1169.3	1082.0	967.8	829.2	697.6	574.2	474.0	386.7	245.7
32.5°	1108.7	1100.6	1052.8	981.8	877.0	747.7	631.2	511.3	416.9	334.3	209.6
35°	966.7	955.0	922.4	853.7	772.2	668.5	552.0	446.1	363.4	286.5	175.9
37.5°	832.7	816.4	789.6	741.9	674.3	587.0	477.5	382.0	306.3	244.6	149.1
40°	697.6	689.5	665.0	628.9	578.8	499.6	408.8	327.3	263.2	205.0	124.6
42.5°	581.2	567.2	550.9	527.6	489.2	425.1	347.1	274.9	213.1	167.7	103.7
45°	467.0	456.5	451.9	435.6	406.5	355.2	290.0	222.4	175.9	139.8	86.2
47.5°	358.7	361.0	361.0	355.2	337.7	294.7	236.4	184.0	149.1	121.1	74.5
50°	278.4	276.0	281.8	286.5	271.4	239.9	188.7	153.7	126.9	102.5	64.1
52.5°	203.8	203.8	216.6	227.1	216.6	192.2	153.7	125.8	103.7	87.3	55.9
55°	138.6	144.4	154.9	174.7	168.9	146.7	124.6	100.2	85.0	71.0	46.6
57.5°	88.5	94.3	106.0	126.9	122.3	111.8	93.2	80.4	66.4	57.1	39.6
60°	54.7	58.2	68.7	86.2	88.5	80.4	68.7	59.4	55.9	50.1	36.1
62.5°	34.9	37.3	47.8	57.1	59.4	53.6	50.1	47.8	46.6	41.9	31.4
65°	23.3	24.5	30.3	38.4	38.4	37.3	34.9	37.3	37.3	33.8	25.6
67.5°	15.1	16.3	21.0	25.6	25.6	25.6	28.0	29.1	29.1	25.6	19.8
70°	11.6	11.6	14.0	16.3	17.5	17.5	18.6	22.1	22.1	19.8	16.3
72.5°	8.2	8.2	9.3	10.5	11.6	11.6	14.0	15.1	16.3	15.1	12.8
75°	5.8	5.8	5.8	7.0	7.0	8.2	9.3	10.5	11.6	11.6	9.3
77.5°	3.5	3.5	3.5	4.7	4.7	4.7	5.8	5.8	7.0	7.0	5.8
80°	1.2	1.2	2.3	2.3	2.3	2.3	3.5	3.5	3.5	3.5	3.5
82.5°	0.0	0.0	1.2	1.2	1.2	1.2	1.2	2.3	2.3	2.3	2.3
85°	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	2.3	2.3	2.3
87.5°	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
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°	902.6	902.6	902.6
2.5°	861.8	845.5	846.7
5°	778.0	741.9	736.1
7.5°	694.1	640.6	625.4
10°	611.4	548.6	526.4
12.5°	522.9	469.4	448.4
15°	456.5	405.3	387.8
17.5°	392.5	349.4	333.1
20°	341.2	301.6	281.8
22.5°	297.0	256.2	241.1
25°	253.9	217.8	208.5
27.5°	215.5	186.3	181.7
30°	182.9	161.9	158.4
32.5°	156.1	142.1	143.3
35°	135.1	125.8	126.9
37.5°	116.5	109.5	114.1
40°	99.0	97.8	102.5
42.5°	86.2	87.3	92.0
45°	73.4	78.0	81.5
47.5°	62.9	71.0	72.2
50°	54.7	62.9	64.1
52.5°	48.9	55.9	55.9
55°	43.1	48.9	48.9
57.5°	38.4	41.9	43.1
60°	33.8	34.9	37.3
62.5°	29.1	30.3	31.4
65°	24.5	25.6	25.6
67.5°	19.8	21.0	21.0
70°	16.3	16.3	15.1
72.5°	10.5	11.6	9.3
75°	8.2	7.0	5.8
77.5°	4.7	4.7	3.5
80°	3.5	3.5	3.5
82.5°	3.5	3.5	2.3
85°	2.3	2.3	2.3
87.5°	1.2	1.2	1.2
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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Scaled Data Report



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