

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: P886970

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4SWMW-1200LM-2700K

Issue Date: 7/10/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886970  
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-2700K  
Description: 4IN SQUARE ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE WHITE TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 2700K CCT  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1007.0 lumens  
Efficiency: N/A  
Efficacy: 57.2 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

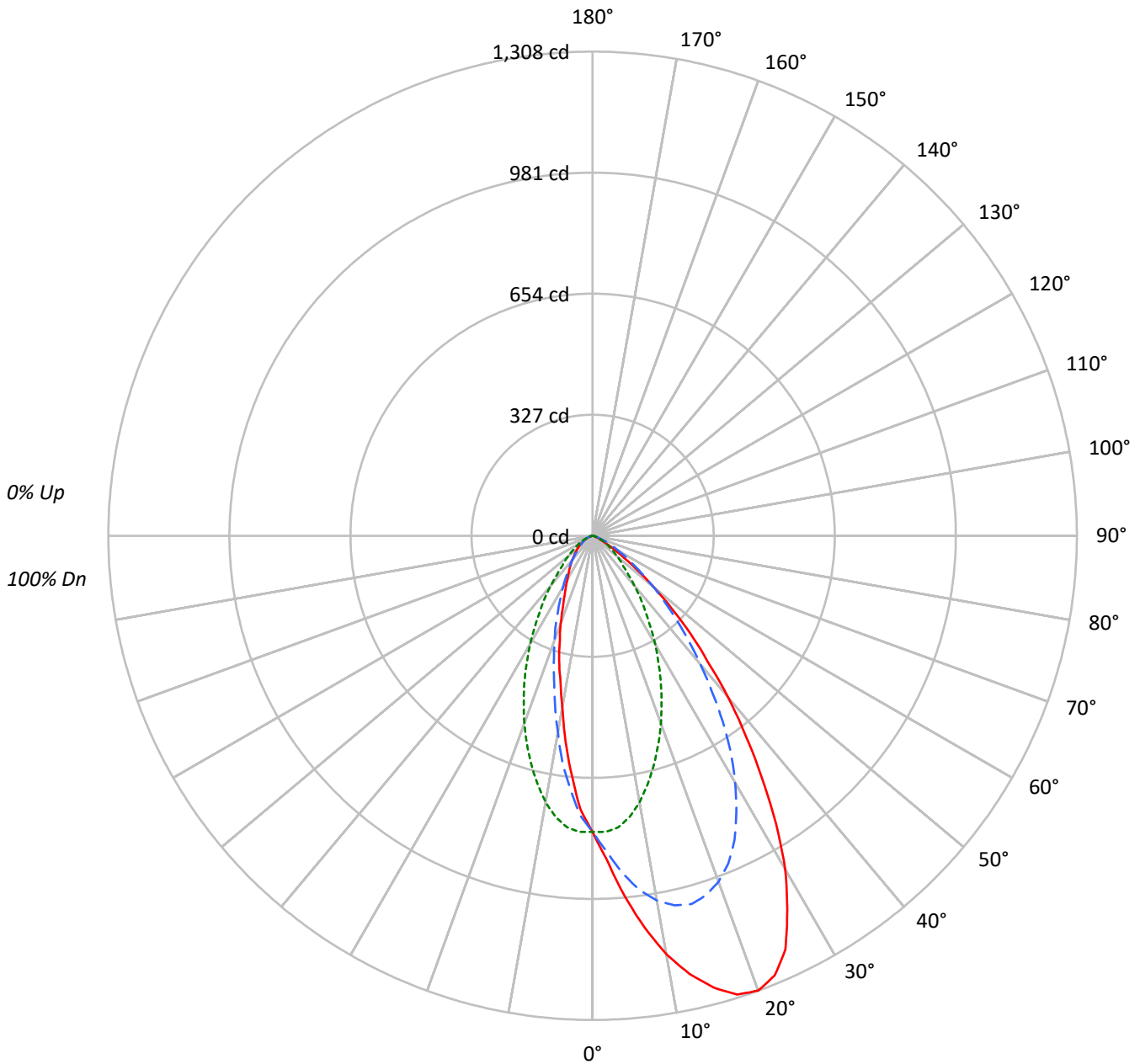
Input Watts (W): 17.6  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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

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

	0°	45°	90°	135°	180°
0°	77481	77481	77481	77481	77481
5°	94688	88853	76902	66885	62996
10°	112899	98439	71889	53100	46224
15°	126730	103322	64167	40308	34992
20°	134804	102495	55546	30917	25866
25°	131753	96917	46593	23505	19230
30°	116415	86056	37798	17786	15213
35°	93995	72353	29199	13600	12772
40°	71805	57275	22118	10623	10749
45°	50951	43690	16166	8357	9179
50°	32237	32011	12961	6631	7686
55°	17565	22463	10303	5911	6587
60°	8138	15500	8331	5425	5619
65°	4355	10201	6418	4585	4355
70°	2832	5807	4815	4249	3116
75°	1871	3182	3369	2620	1497
80°	558	1674	1116	1674	1116
85°	0	1112	1112	1112	1112

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 50951 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	75.5	7.5
10°-20°	202.1	20.1
20°-30°	258.8	25.7
30°-40°	223.3	22.2
40°-50°	140.1	13.9
50°-60°	69.4	6.9
60°-70°	28.2	2.8
70°-80°	8.4	0.8
80°-90°	1.1	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°	536.5	53.3
0°-40°	759.8	75.5
0°-60°	969.4	96.3
0°-90°	1007.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1007.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	800	800	800	800	800	
5°	974	914	791	688	648	98
15°	1264	1030	640	402	349	357
25°	1233	907	436	220	180	555
35°	795	612	247	115	108	496
45°	372	319	118	61	67	288
55°	104	133	61	35	39	100
65°	19	44	28	20	19	21
75°	5	8	9	7	4	5
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°	799.8	799.8	799.8	799.8	799.8	799.8	799.8	799.8	799.8	799.8	799.8
2.5°	875.7	880.7	867.7	867.7	857.7	848.7	839.7	825.8	813.8	800.8	775.8
5°	973.7	969.7	957.7	947.7	927.7	899.7	876.7	847.7	816.8	790.8	732.8
7.5°	1065.7	1060.7	1039.7	1018.7	985.7	942.7	899.7	852.7	805.8	765.8	680.8
10°	1147.7	1139.7	1114.7	1075.7	1029.7	971.7	910.7	844.7	784.8	730.8	623.8
12.5°	1212.6	1201.6	1172.7	1121.7	1059.7	985.7	909.7	828.8	753.8	686.8	562.8
15°	1263.6	1253.6	1212.6	1152.7	1073.7	986.7	893.7	803.8	715.8	639.8	503.8
17.5°	1299.6	1285.6	1234.6	1161.7	1068.7	967.7	866.7	765.8	672.8	589.8	447.9
20°	1307.6	1289.6	1234.6	1153.7	1049.7	938.7	830.8	720.8	623.8	538.8	391.9
22.5°	1285.6	1266.6	1210.6	1123.7	1018.7	897.7	782.8	668.8	570.8	485.9	339.9
25°	1232.6	1211.6	1158.7	1074.7	967.7	845.7	724.8	620.8	522.8	435.9	290.9
27.5°	1138.7	1128.7	1080.7	1001.7	899.7	781.8	662.8	561.8	463.9	383.9	249.9
30°	1040.7	1030.7	989.7	920.7	824.8	713.8	604.8	502.9	410.9	337.9	212.9
32.5°	921.7	909.7	880.7	820.8	743.8	646.8	537.8	443.9	360.9	288.9	182.9
35°	794.8	794.8	769.8	722.8	655.8	567.8	473.9	386.9	310.9	246.9	152.0
37.5°	677.8	680.8	659.8	616.8	562.8	493.9	407.9	329.9	263.9	211.9	128.0
40°	567.8	560.8	549.8	524.8	480.9	424.9	348.9	281.9	222.9	174.9	107.0
42.5°	458.9	463.9	450.9	436.9	405.9	358.9	297.9	237.9	182.9	143.0	88.0
45°	371.9	369.9	365.9	355.9	339.9	297.9	246.9	191.9	150.0	118.0	73.0
47.5°	285.9	288.9	287.9	287.9	276.9	246.9	201.9	155.0	126.0	103.0	63.0
50°	213.9	221.9	226.9	230.9	223.9	200.9	157.0	128.0	107.0	86.0	54.0
52.5°	154.0	158.0	171.9	187.9	180.9	158.0	129.0	107.0	88.0	72.0	46.0
55°	104.0	112.0	127.0	143.0	142.0	124.0	105.0	87.0	74.0	61.0	39.0
57.5°	66.0	70.0	88.0	107.0	107.0	98.0	84.0	73.0	58.0	49.0	33.0
60°	42.0	45.0	58.0	76.0	82.0	78.0	68.0	55.0	49.0	43.0	30.0
62.5°	28.0	29.0	39.0	52.0	60.0	60.0	51.0	45.0	40.0	35.0	26.0
65°	19.0	20.0	26.0	35.0	44.0	45.0	39.0	35.0	32.0	28.0	22.0
67.5°	13.0	14.0	18.0	24.0	29.0	31.0	30.0	28.0	25.0	21.0	17.0
70°	10.0	10.0	12.0	16.0	20.0	21.0	21.0	21.0	19.0	17.0	14.0
72.5°	7.0	8.0	8.0	11.0	13.0	14.0	15.0	15.0	14.0	13.0	11.0
75°	5.0	5.0	6.0	7.0	8.0	9.0	10.0	10.0	10.0	9.0	8.0
77.5°	3.0	3.0	4.0	4.0	5.0	6.0	6.0	6.0	5.0	5.0	5.0
80°	1.0	1.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0
82.5°	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0
85°	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
87.5°	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0
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°	799.8	799.8	799.8
2.5°	756.8	742.8	740.8
5°	687.8	664.8	647.8
7.5°	619.8	574.8	560.8
10°	539.8	491.9	469.9
12.5°	468.9	417.9	400.9
15°	401.9	357.9	348.9
17.5°	347.9	307.9	294.9
20°	299.9	261.9	250.9
22.5°	259.9	221.9	209.9
25°	219.9	188.9	179.9
27.5°	186.9	161.0	156.0
30°	159.0	138.0	136.0
32.5°	136.0	120.0	121.0
35°	115.0	105.0	108.0
37.5°	100.0	93.0	96.0
40°	84.0	82.0	85.0
42.5°	72.0	73.0	76.0
45°	61.0	65.0	67.0
47.5°	52.0	58.0	59.0
50°	44.0	51.0	51.0
52.5°	39.0	45.0	45.0
55°	35.0	39.0	39.0
57.5°	32.0	34.0	34.0
60°	28.0	28.0	29.0
62.5°	23.0	24.0	24.0
65°	20.0	20.0	19.0
67.5°	17.0	17.0	15.0
70°	15.0	14.0	11.0
72.5°	11.0	10.0	7.0
75°	7.0	6.0	4.0
77.5°	4.0	3.0	2.0
80°	3.0	2.0	2.0
82.5°	2.0	2.0	1.0
85°	1.0	1.0	1.0
87.5°	1.0	1.0	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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