

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: P886955

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMW-1200LM-2700K

Issue Date: 7/9/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886955  
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-2700K  
Description: 4IN ROUND ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE WHITE TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 2700K CCT  
Ballast/Driver: -

**Summary**

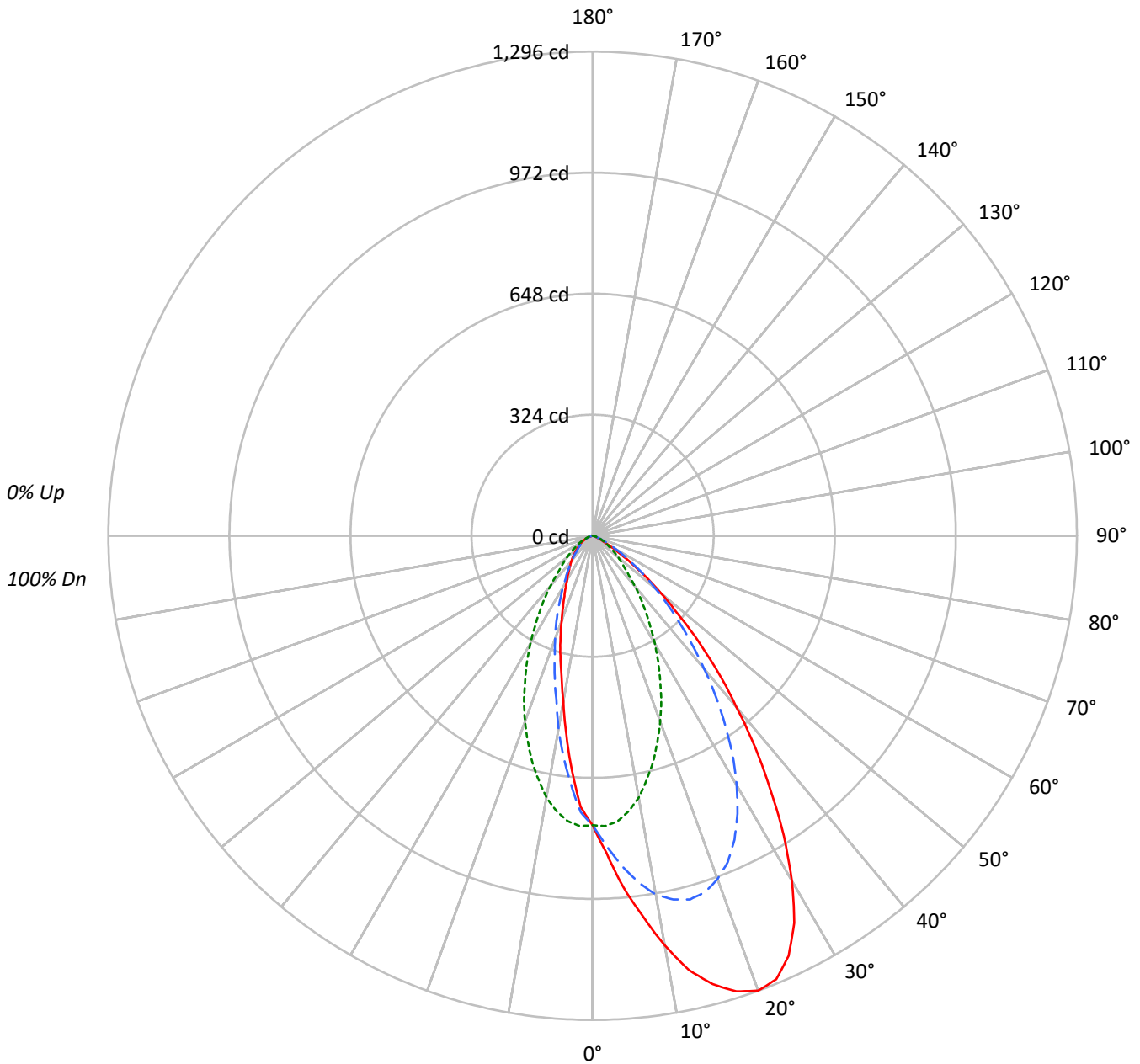
Lumens per Lamp: N/A  
Luminaire Lumens: 1008.0 lumens  
Efficiency: N/A  
Efficacy: 57.3 lumens/watt  
Spacing Criteria (0/90/45): 1.16 / 0.81 / 1.01  
Luminous Opening: Circular (Dia: 0.25' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 17.6  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): 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										
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	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°	169877	169877	169877	169877	169877
5°	207946	194959	168765	146995	139071
10°	247958	217141	158269	116854	100622
15°	282090	228764	142067	88968	75574
20°	302333	228150	123397	68349	56448
25°	300162	217198	103288	52721	43285
30°	270092	195283	84038	39728	34436
35°	222104	165514	65826	31052	29178
40°	171407	132491	50351	24331	25190
45°	124323	101375	37213	19537	21708
50°	81498	74846	30020	16034	18763
55°	45494	51802	23321	14145	16057
60°	20612	31796	18858	12718	14034
65°	10377	16863	15047	10896	11415
70°	6411	9617	10899	8976	8335
75°	4236	5507	8472	5931	4236
80°	1263	2526	3788	3788	3788
85°	0	2516	5032	5032	5032

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 124323 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	73.3	7.3
10°-20°	197.5	19.6
20°-30°	257.2	25.5
30°-40°	226.4	22.5
40°-50°	145.0	14.4
50°-60°	72.0	7.1
60°-70°	27.1	2.7
70°-80°	7.9	0.8
80°-90°	1.4	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°	528.0	52.4
0°-40°	754.5	74.8
0°-60°	971.5	96.4
0°-90°	1008.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1008.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	775	775	775	775	775	
5°	945	886	767	668	632	95
15°	1243	1008	626	392	333	351
25°	1241	898	427	218	179	561
35°	830	618	246	116	109	517
45°	401	327	120	63	70	311
55°	119	136	61	37	42	113
65°	20	32	29	21	22	22
75°	5	6	10	7	5	5
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°	774.7	774.7	774.7	774.7	774.7	774.7	774.7	774.7	774.7	774.7	774.7
2.5°	849.7	851.7	844.7	837.7	833.7	824.7	813.7	797.7	789.7	777.7	755.8
5°	944.7	944.7	937.7	916.7	898.7	872.7	850.7	821.7	793.7	766.7	714.8
7.5°	1026.7	1026.7	1012.7	992.7	955.7	914.7	873.7	826.7	783.7	742.8	663.8
10°	1113.6	1108.6	1089.6	1052.7	1001.7	948.7	884.7	821.7	765.7	710.8	605.8
12.5°	1190.6	1177.6	1147.6	1099.6	1033.7	960.7	885.7	806.7	734.8	668.8	545.8
15°	1242.6	1231.6	1191.6	1130.6	1051.7	963.7	873.7	781.7	698.8	625.8	489.8
17.5°	1278.6	1267.6	1215.6	1142.6	1050.7	949.7	848.7	748.8	657.8	576.8	431.9
20°	1295.6	1280.6	1226.6	1139.6	1032.7	922.7	811.7	704.8	611.8	528.8	379.9
22.5°	1284.6	1266.6	1204.6	1117.6	1005.7	884.7	769.7	661.8	560.8	479.8	329.9
25°	1240.6	1228.6	1163.6	1069.6	959.7	835.7	715.8	606.8	508.8	426.9	285.9
27.5°	1168.6	1147.6	1089.6	1010.7	899.7	778.7	657.8	552.8	459.8	379.9	245.9
30°	1066.7	1048.7	1003.7	928.7	830.7	711.8	598.8	492.8	406.9	331.9	210.9
32.5°	951.7	944.7	903.7	842.7	752.8	641.8	541.8	438.9	357.9	286.9	179.9
35°	829.7	819.7	791.7	732.8	662.8	573.8	473.8	382.9	311.9	245.9	151.0
37.5°	714.8	700.8	677.8	636.8	578.8	503.8	409.9	327.9	262.9	209.9	128.0
40°	598.8	591.8	570.8	539.8	496.8	428.9	350.9	280.9	225.9	175.9	107.0
42.5°	498.8	486.8	472.8	452.9	419.9	364.9	297.9	235.9	182.9	144.0	89.0
45°	400.9	391.9	387.9	373.9	348.9	304.9	248.9	190.9	151.0	120.0	74.0
47.5°	307.9	309.9	309.9	304.9	289.9	252.9	202.9	157.9	128.0	104.0	64.0
50°	238.9	236.9	241.9	245.9	232.9	205.9	161.9	132.0	109.0	88.0	55.0
52.5°	174.9	174.9	185.9	194.9	185.9	164.9	132.0	108.0	89.0	75.0	48.0
55°	119.0	124.0	133.0	150.0	145.0	126.0	107.0	86.0	73.0	61.0	40.0
57.5°	76.0	81.0	91.0	109.0	105.0	96.0	80.0	69.0	57.0	49.0	34.0
60°	47.0	50.0	59.0	74.0	76.0	69.0	59.0	51.0	48.0	43.0	31.0
62.5°	30.0	32.0	41.0	49.0	51.0	46.0	43.0	41.0	40.0	36.0	27.0
65°	20.0	21.0	26.0	33.0	33.0	32.0	30.0	32.0	32.0	29.0	22.0
67.5°	13.0	14.0	18.0	22.0	22.0	22.0	24.0	25.0	25.0	22.0	17.0
70°	10.0	10.0	12.0	14.0	15.0	15.0	16.0	19.0	19.0	17.0	14.0
72.5°	7.0	7.0	8.0	9.0	10.0	10.0	12.0	13.0	14.0	13.0	11.0
75°	5.0	5.0	5.0	6.0	6.0	7.0	8.0	9.0	10.0	10.0	8.0
77.5°	3.0	3.0	3.0	4.0	4.0	4.0	5.0	5.0	6.0	6.0	5.0
80°	1.0	1.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0
82.5°	0.0	0.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0
85°	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0
87.5°	0.0	0.0	0.0	0.0	1.0	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°	774.7	774.7	774.7
2.5°	739.8	725.8	726.8
5°	667.8	636.8	631.8
7.5°	595.8	549.8	536.8
10°	524.8	470.8	451.9
12.5°	448.9	402.9	384.9
15°	391.9	347.9	332.9
17.5°	336.9	299.9	285.9
20°	292.9	258.9	241.9
22.5°	254.9	219.9	206.9
25°	217.9	186.9	178.9
27.5°	184.9	159.9	155.9
30°	156.9	139.0	136.0
32.5°	134.0	122.0	123.0
35°	116.0	108.0	109.0
37.5°	100.0	94.0	98.0
40°	85.0	84.0	88.0
42.5°	74.0	75.0	79.0
45°	63.0	67.0	70.0
47.5°	54.0	61.0	62.0
50°	47.0	54.0	55.0
52.5°	42.0	48.0	48.0
55°	37.0	42.0	42.0
57.5°	33.0	36.0	37.0
60°	29.0	30.0	32.0
62.5°	25.0	26.0	27.0
65°	21.0	22.0	22.0
67.5°	17.0	18.0	18.0
70°	14.0	14.0	13.0
72.5°	9.0	10.0	8.0
75°	7.0	6.0	5.0
77.5°	4.0	4.0	3.0
80°	3.0	3.0	3.0
82.5°	3.0	3.0	2.0
85°	2.0	2.0	2.0
87.5°	1.0	1.0	1.0
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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