

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: P886957

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMW-1200LM-3500K

Issue Date: 7/9/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886957  
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-3500K  
Description: 4IN ROUND 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: 1074.7 lumens  
Efficiency: N/A  
Efficacy: 61.1 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

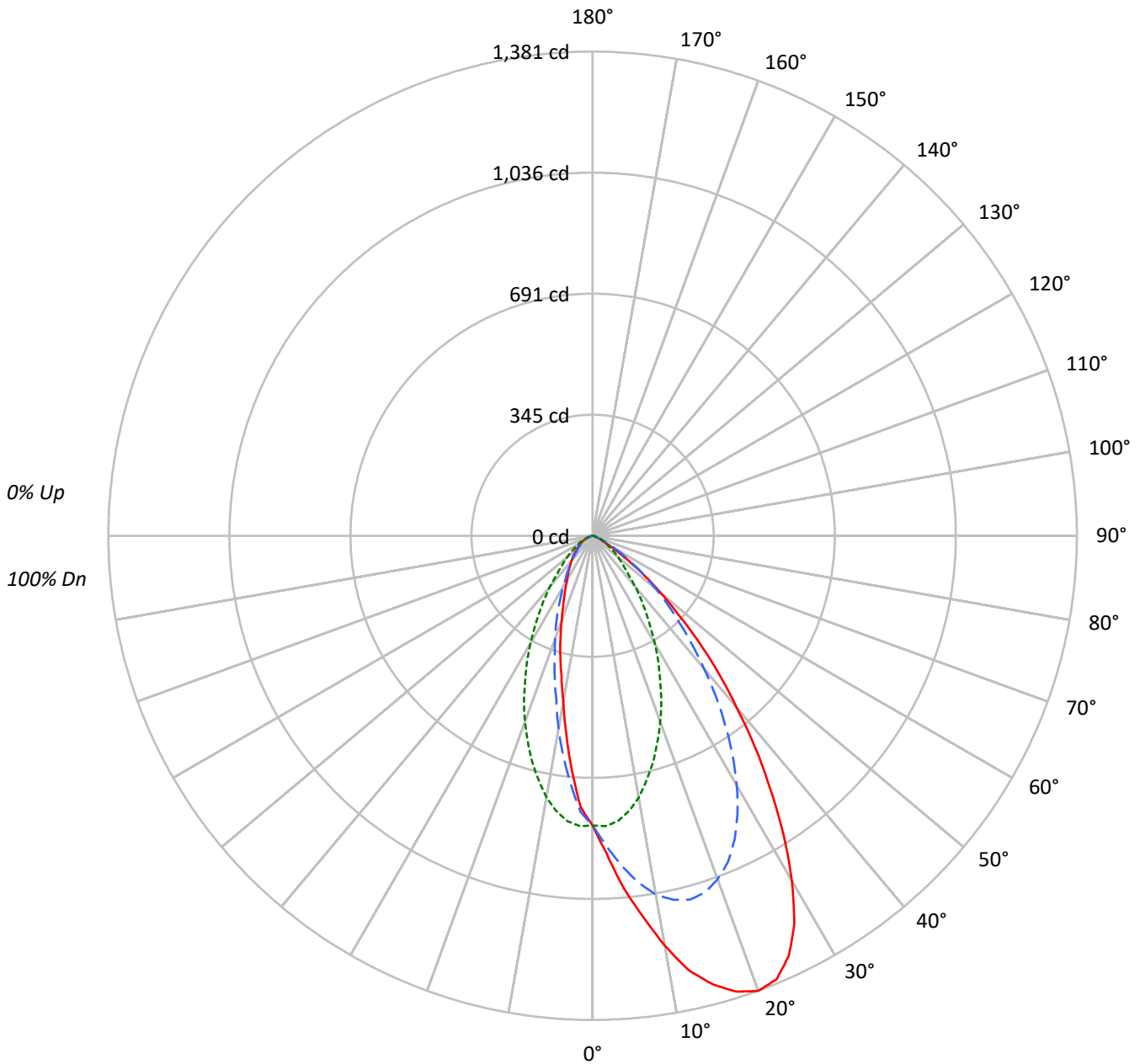
Input Watts (W): 17.6  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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### Luminous Intensity Polar Plot





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

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

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

	0°	45°	90°	135°	180°
0°	181126	181126	181126	181126	181126
5°	221703	207869	179947	156724	148272
10°	264368	231514	168734	124602	107279
15°	300751	243895	151465	94847	80568
20°	322331	243248	131565	72876	60182
25°	320027	231570	110111	56229	46164
30°	287943	208209	89609	42361	36715
35°	236801	176463	70189	33087	31106
40°	182742	141250	53701	25934	26850
45°	132541	108089	39663	20808	23134
50°	86888	79810	31999	17091	19991
55°	48476	55205	24850	15063	17127
60°	21972	33879	20086	13552	14955
65°	11052	17979	16033	11623	12141
70°	6860	10258	11605	9553	8912
75°	4490	5888	9065	6354	4490
80°	1389	2652	4041	4041	4041
85°	0	2768	5284	5284	5284

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 132541 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	78.1	7.3
10°-20°	210.6	19.6
20°-30°	274.3	25.5
30°-40°	241.4	22.5
40°-50°	154.6	14.4
50°-60°	76.8	7.1
60°-70°	28.9	2.7
70°-80°	8.5	0.8
80°-90°	1.5	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°	563.0	52.4
0°-40°	804.4	74.8
0°-60°	1035.8	96.4
0°-90°	1074.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1074.7	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	826	826	826	826	826	
5°	1007	944	818	712	674	101
15°	1325	1074	667	418	355	374
25°	1323	957	455	232	191	598
35°	885	659	262	124	116	551
45°	427	349	128	67	75	332
55°	127	144	65	39	45	121
65°	21	35	31	22	23	24
75°	5	7	11	8	5	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°	826.0	826.0	826.0	826.0	826.0	826.0	826.0	826.0	826.0	826.0	826.0
2.5°	906.0	908.1	900.6	893.2	888.9	879.3	867.6	850.5	842.0	829.2	805.8
5°	1007.2	1007.2	999.7	977.4	958.2	930.5	907.0	876.1	846.3	817.5	762.1
7.5°	1094.6	1094.6	1079.7	1058.4	1018.9	975.2	931.5	881.4	835.6	791.9	707.7
10°	1187.3	1182.0	1161.8	1122.3	1068.0	1011.5	943.3	876.1	816.4	757.8	645.9
12.5°	1269.4	1255.5	1223.6	1172.4	1102.1	1024.3	944.3	860.1	783.4	713.0	581.9
15°	1324.8	1313.1	1270.5	1205.5	1121.2	1027.5	931.5	833.5	745.0	667.2	522.3
17.5°	1363.2	1351.5	1296.0	1218.2	1120.2	1012.5	904.9	798.3	701.3	615.0	460.4
20°	1381.3	1365.3	1307.8	1215.0	1101.0	983.8	865.5	751.4	652.3	563.8	405.0
22.5°	1369.6	1350.4	1284.3	1191.6	1072.2	943.3	820.7	705.6	597.9	511.6	351.7
25°	1322.7	1309.9	1240.6	1140.4	1023.2	891.0	763.1	647.0	542.5	455.1	304.8
27.5°	1246.0	1223.6	1161.8	1077.6	959.2	830.3	701.3	589.4	490.3	405.0	262.2
30°	1137.2	1118.1	1070.1	990.2	885.7	758.9	638.4	525.5	433.8	353.9	224.9
32.5°	1014.7	1007.2	963.5	898.5	802.6	684.3	577.7	467.9	381.6	305.9	191.8
35°	884.6	874.0	844.1	781.3	706.6	611.8	505.2	408.2	332.5	262.2	160.9
37.5°	762.1	747.1	722.6	678.9	617.1	537.2	437.0	349.6	280.3	223.8	136.4
40°	638.4	631.0	608.6	575.5	529.7	457.2	374.1	299.5	240.9	187.6	114.0
42.5°	531.8	519.1	504.1	482.8	447.6	389.0	317.6	251.5	195.0	153.5	94.9
45°	427.4	417.8	413.5	398.6	372.0	325.1	265.4	203.6	160.9	127.9	78.9
47.5°	328.3	330.4	330.4	325.1	309.1	269.7	216.4	168.4	136.4	110.8	68.2
50°	254.7	252.6	257.9	262.2	248.3	219.6	172.7	140.7	116.2	93.8	58.6
52.5°	186.5	186.5	198.2	207.8	198.2	175.9	140.7	115.1	94.9	79.9	51.2
55°	126.8	132.2	141.8	159.9	154.5	134.3	114.0	91.7	77.8	65.0	42.6
57.5°	81.0	86.3	97.0	116.2	111.9	102.3	85.3	73.5	60.8	52.2	36.2
60°	50.1	53.3	62.9	78.9	81.0	73.5	62.9	54.4	51.2	45.8	33.0
62.5°	32.0	34.1	43.7	52.2	54.4	49.0	45.8	43.7	42.6	38.4	28.8
65°	21.3	22.4	27.7	35.2	35.2	34.1	32.0	34.1	34.1	30.9	23.4
67.5°	13.9	14.9	19.2	23.4	23.4	23.4	25.6	26.6	26.6	23.4	18.1
70°	10.7	10.7	12.8	14.9	16.0	16.0	17.1	20.3	20.3	18.1	14.9
72.5°	7.5	7.5	8.5	9.6	10.7	10.7	12.8	13.9	14.9	13.9	11.7
75°	5.3	5.3	5.3	6.4	6.4	7.5	8.5	9.6	10.7	10.7	8.5
77.5°	3.2	3.2	3.2	4.3	4.3	4.3	5.3	5.3	6.4	6.4	5.3
80°	1.1	1.1	2.1	2.1	2.1	2.1	3.2	3.2	3.2	3.2	3.2
82.5°	0.0	0.0	1.1	1.1	1.1	1.1	1.1	2.1	2.1	2.1	2.1
85°	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	2.1	2.1	2.1
87.5°	0.0	0.0	0.0	0.0	1.1	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°	826.0	826.0	826.0
2.5°	788.7	773.8	774.9
5°	712.0	678.9	673.6
7.5°	635.2	586.2	572.3
10°	559.6	502.0	481.8
12.5°	478.6	429.5	410.3
15°	417.8	370.9	354.9
17.5°	359.2	319.7	304.8
20°	312.3	276.0	257.9
22.5°	271.8	234.5	220.6
25°	232.4	199.3	190.8
27.5°	197.2	170.5	166.3
30°	167.3	148.1	145.0
32.5°	142.8	130.0	131.1
35°	123.6	115.1	116.2
37.5°	106.6	100.2	104.5
40°	90.6	89.5	93.8
42.5°	78.9	79.9	84.2
45°	67.1	71.4	74.6
47.5°	57.6	65.0	66.1
50°	50.1	57.6	58.6
52.5°	44.8	51.2	51.2
55°	39.4	44.8	44.8
57.5°	35.2	38.4	39.4
60°	30.9	32.0	34.1
62.5°	26.6	27.7	28.8
65°	22.4	23.4	23.4
67.5°	18.1	19.2	19.2
70°	14.9	14.9	13.9
72.5°	9.6	10.7	8.5
75°	7.5	6.4	5.3
77.5°	4.3	4.3	3.2
80°	3.2	3.2	3.2
82.5°	3.2	3.2	2.1
85°	2.1	2.1	2.1
87.5°	1.1	1.1	1.1
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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