

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: P886951

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMB-1200LM-3000K

Issue Date: 7/9/2024

Test Information

Test Method: LM-79-2019
Report Number: P886951
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-47)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 7/9/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO
Catalog Number: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMB-1200LM-3000K
Description: 4IN ROUND ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE BLACK TRIM
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 3000K CCT
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 978.1 lumens
Efficiency: N/A
Efficacy: 55.6 lumens/watt
Spacing Criteria (0/90/45): 1.15 / 0.8 / 0.99
Luminous Opening: Circular (Dia: 0.25' x H: 0')
CIE Type: Direct

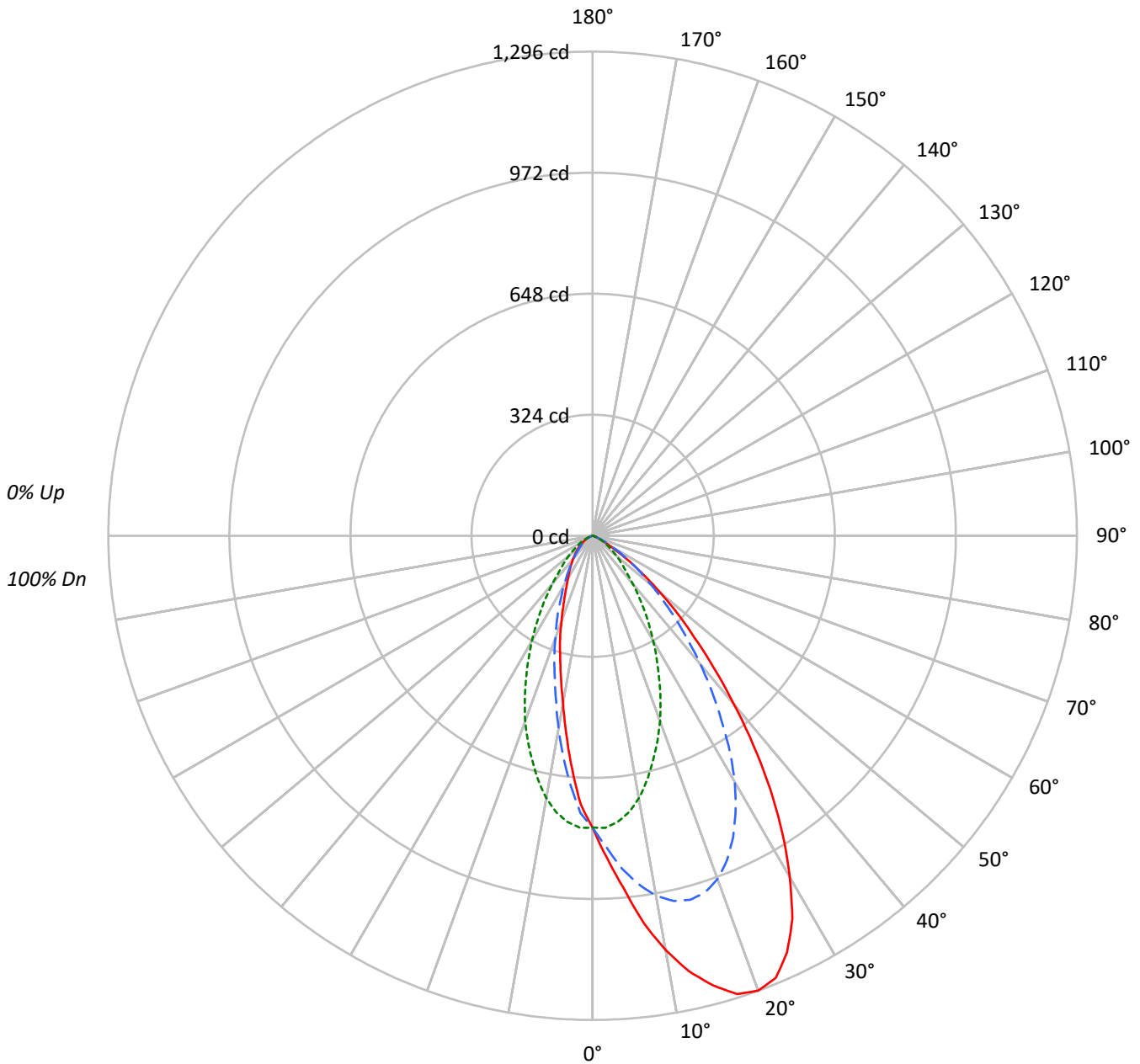
Input Watts (W): 17.6
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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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	113	109	106	104	110	107	105	102	103	101	99	99	98	96	96	95	93	91					91			
2	106	100	95	91	103	98	94	90	95	91	88	92	89	86	89	87	85	83					83			
3	99	92	86	81	97	90	85	81	87	83	79	85	81	78	83	79	77	75					75			
4	93	84	78	73	91	83	77	72	81	76	71	79	74	71	77	73	70	68					68			
5	87	78	71	66	86	77	70	65	75	69	65	73	68	64	71	67	64	62					62			
6	82	72	65	60	80	71	64	60	69	64	59	68	63	59	66	62	58	57					57			
7	77	67	60	55	76	66	59	55	64	59	54	63	58	54	62	57	54	52					52			
8	73	62	55	50	72	61	55	50	60	54	50	59	54	50	58	53	50	48					48			
9	69	58	51	47	68	57	51	47	56	50	46	55	50	46	54	50	46	44					44			
10	65	54	48	43	64	54	47	43	53	47	43	52	47	43	51	46	43	41					41			

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°	135°	180°
0°	171302	171302	171302	171302	171302
5°	208254	196566	169227	147677	138146
10°	250830	217887	158804	116587	101423
15°	282862	229048	141545	88672	76028
20°	302310	228115	123141	67813	56752
25°	297719	215190	101982	51608	42390
30°	267206	192587	82190	38614	33144
35°	221810	160428	63738	29526	27599
40°	168144	128183	47489	22413	23015
45°	119516	97157	36128	17273	19506
50°	79452	69797	27769	13714	16170
55°	46488	48457	20874	11431	12998
60°	21226	28463	16709	9473	10394
65°	10689	14969	11207	7472	8042
70°	5963	7245	7245	5257	4616
75°	2626	2626	3474	1779	847
80°	0	631	1263	0	0
85°	0	0	0	0	0

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 10°
 Vertical Angle: 45°
 Luminance: 121129 cd/sqm



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	73.7	7.5
10°-20°	197.8	20.2
20°-30°	254.7	26.0
30°-40°	220.7	22.6
40°-50°	138.6	14.2
50°-60°	66.4	6.8
60°-70°	22.3	2.3
70°-80°	3.8	0.4
80°-90°	0.1	0.0
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°	526.2	53.8
0°-40°	746.9	76.4
0°-60°	951.9	97.3
0°-90°	978.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	978.1	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	781	781	781	781	781	
5°	946	893	769	671	628	96
15°	1246	1009	624	391	335	352
25°	1230	889	422	213	175	557
35°	829	599	238	110	103	513
45°	385	313	116	56	63	303
55°	122	127	55	30	34	113
65°	21	29	22	14	16	23
75°	3	3	4	2	1	4
85°	0	0	0	0	0	0
90°	0	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°	781.2	781.2	781.2	781.2	781.2	781.2	781.2	781.2	781.2	781.2	781.2
2.5°	861.6	851.3	853.3	848.2	839.9	827.6	819.3	807.0	795.6	782.2	758.5
5°	946.1	947.1	935.8	923.4	909.0	877.0	853.3	825.5	796.7	768.8	714.2
7.5°	1045.0	1038.9	1024.4	993.5	961.6	919.3	877.0	832.7	789.4	746.2	663.7
10°	1126.5	1117.2	1094.5	1054.3	1010.0	947.1	889.4	825.5	766.8	713.2	608.1
12.5°	1194.5	1186.2	1155.3	1101.7	1038.9	963.6	886.3	809.0	736.9	670.9	546.2
15°	1246.0	1234.7	1194.5	1132.6	1054.3	963.6	875.0	782.2	699.8	623.5	487.5
17.5°	1286.2	1268.7	1217.2	1145.0	1051.2	950.2	847.2	749.3	657.5	576.1	429.8
20°	1295.5	1280.0	1221.3	1137.8	1035.8	919.3	811.1	702.9	611.2	527.7	377.2
22.5°	1281.0	1257.3	1203.8	1113.1	1000.7	879.1	764.7	658.6	558.6	474.1	325.7
25°	1230.5	1214.1	1156.3	1062.6	950.2	828.6	710.1	597.8	508.1	421.5	282.4
27.5°	1157.4	1137.8	1081.1	999.7	891.5	765.7	651.3	545.2	453.5	371.0	242.2
30°	1055.3	1041.9	993.5	911.1	820.4	700.8	590.5	488.5	399.9	324.6	207.2
32.5°	946.1	927.5	888.4	821.4	735.9	629.7	525.6	428.7	346.3	279.3	174.2
35°	828.6	818.3	779.1	717.3	644.1	554.5	461.7	372.1	297.8	238.1	146.3
37.5°	707.0	694.6	669.9	620.4	562.7	482.3	396.8	319.5	253.5	201.0	121.6
40°	587.4	579.2	560.7	525.6	480.3	415.3	336.0	268.0	210.2	165.9	101.0
42.5°	481.3	479.2	467.9	442.1	405.0	346.3	286.5	222.6	174.2	136.0	81.4
45°	385.4	390.6	379.3	363.8	336.0	290.6	236.0	183.4	145.3	116.5	69.1
47.5°	308.2	304.0	303.0	296.8	273.1	236.0	189.6	151.5	125.7	98.9	59.8
50°	232.9	231.9	237.0	238.1	218.5	190.7	154.6	127.8	102.0	81.4	49.5
52.5°	171.1	173.1	181.4	187.6	175.2	150.5	127.8	102.0	84.5	68.0	42.3
55°	121.6	121.6	134.0	141.2	135.0	118.5	97.9	80.4	66.0	54.6	34.0
57.5°	76.3	79.4	91.7	101.0	98.9	88.6	73.2	60.8	52.6	45.3	29.9
60°	48.4	50.5	60.8	68.0	68.0	61.8	53.6	46.4	43.3	38.1	25.8
62.5°	30.9	34.0	40.2	46.4	47.4	41.2	36.1	36.1	34.0	29.9	21.6
65°	20.6	21.6	26.8	29.9	29.9	27.8	26.8	26.8	25.8	21.6	15.5
67.5°	13.4	14.4	17.5	19.6	18.6	16.5	18.6	19.6	18.6	16.5	12.4
70°	9.3	9.3	10.3	12.4	11.3	11.3	12.4	12.4	12.4	11.3	8.2
72.5°	6.2	6.2	6.2	6.2	6.2	6.2	7.2	8.2	8.2	8.2	5.2
75°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	4.1	4.1	4.1	2.1
77.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
80°	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
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°	781.2	781.2	781.2
2.5°	743.1	733.8	720.4
5°	670.9	642.1	627.6
7.5°	598.8	554.5	536.9
10°	523.6	474.1	455.5
12.5°	452.4	406.1	389.6
15°	390.6	348.3	334.9
17.5°	341.1	300.9	289.6
20°	290.6	254.6	243.2
22.5°	251.5	217.5	205.1
25°	213.3	182.4	175.2
27.5°	180.4	155.6	150.5
30°	152.5	135.0	130.9
32.5°	129.9	117.5	116.5
35°	110.3	102.0	103.1
37.5°	93.8	88.6	91.7
40°	78.3	78.3	80.4
42.5°	67.0	69.1	72.1
45°	55.7	60.8	62.9
47.5°	46.4	52.6	54.6
50°	40.2	45.3	47.4
52.5°	35.0	39.2	40.2
55°	29.9	34.0	34.0
57.5°	25.8	27.8	28.9
60°	21.6	23.7	23.7
62.5°	17.5	19.6	19.6
65°	14.4	15.5	15.5
67.5°	11.3	11.3	11.3
70°	8.2	8.2	7.2
72.5°	4.1	4.1	4.1
75°	2.1	1.0	1.0
77.5°	0.0	0.0	0.0
80°	0.0	0.0	0.0
82.5°	0.0	0.0	0.0
85°	0.0	0.0	0.0
87.5°	0.0	0.0	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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Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
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Peachtree City, GA 30269

Scaled Data Report





— 0°-180° - - 45°-225° - - - - 90°-270°

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