

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State
Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: HALO

Report Number: P601277

Luminaire Tested: **ML410LSAWW9FS1E - TIR4D25AWW - TL41R_ TL42S_ 4000K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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Test Information

Test Method: LM-79-08
 Report Number: P601277
 Test Lab: COOPER LIGHTING SOLUTIONS
 Issue Date: 7/29/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: HALO
 Catalog Number: ML410LSAWW9FS1E - TIR4D25AWW - TL41R_ TL42S_ 4000K
 Description: RETROFIT, 25D WW OPTIC, OPEN TRIM
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 4000K CCT
 Ballast/Driver: -

Summary

Lumens per Lamp: N/A
 Luminaire Lumens: 719.8 lumens
 Efficiency: N/A
 Efficacy: 60.0 lumens/watt
 Spacing Criteria (0/90/45): 1.31 / 0.61 / 0.81
 Luminous Opening: Circular (Dia: 0.21' x H: 0')
 CIE Type: Direct

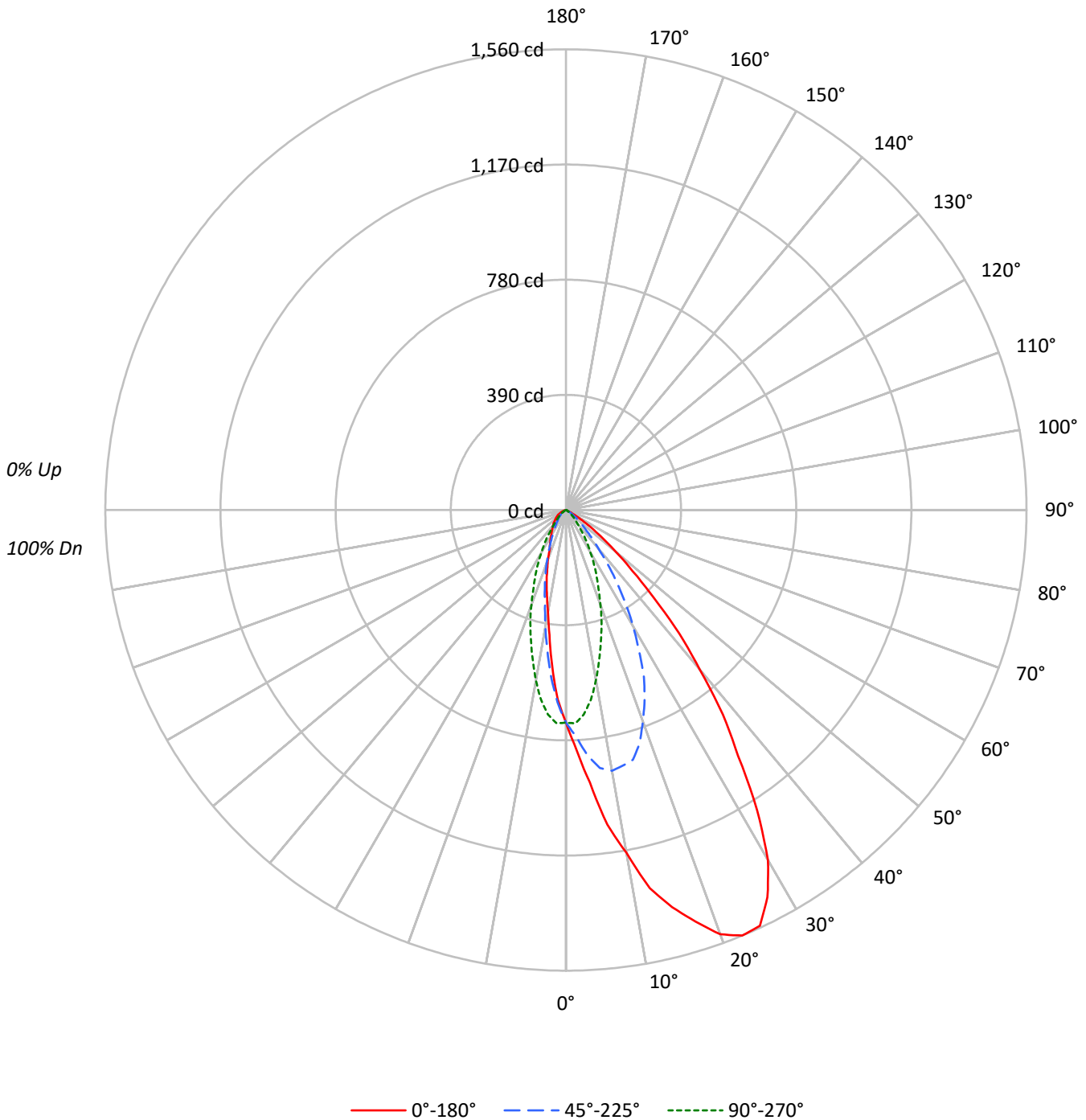
Input Watts (W): 12
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



Meas			
Instrument	Identificatio		Calibration Due Date
Photometer	GONIO 1 11111111	4/22/2021	10/22/2021
Power Meter	XITRON 2801 IN0197	12/1/2020	12/1/2021
AC Power Source	CHROMA 61505 IN0196	12/1/2020	12/1/2021
DC Power Supply	AGILENT E3634A IN0198	11/30/2020	11/30/2021
Room Thermometer	ONSET IN0143	12/1/2020	12/1/2021

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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	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	113	110	107	105	111	108	106	103	104	102	100	100	99	97	97	96	94	93
2	107	102	97	94	105	100	96	93	97	93	91	94	91	89	91	89	87	85
3	101	94	89	84	99	93	88	84	90	86	82	87	84	81	85	82	80	78
4	95	87	81	77	93	86	80	76	84	79	75	82	78	74	80	76	73	72
5	90	81	75	70	88	80	74	70	78	73	69	76	72	68	75	71	68	66
6	85	75	69	64	83	75	68	64	73	68	64	72	67	63	70	66	63	61
7	80	70	64	59	79	70	64	59	68	63	59	67	62	59	66	62	58	57
8	76	66	60	55	75	65	59	55	64	59	55	63	58	55	62	58	54	53
9	72	62	56	51	71	61	55	51	60	55	51	60	54	51	59	54	51	49
10	69	58	52	48	68	58	52	48	57	52	48	56	51	48	55	51	48	46

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	227225	227225	227225
5°	293547	220263	169009
10°	377902	187604	111966
15°	455083	149264	82543
20°	513757	114956	59847
25°	541322	85081	44805
30°	498975	60635	36133
35°	391993	40938	31378
40°	291303	24815	27700
45°	188091	16880	24739
50°	110088	12183	22008
55°	58465	8423	19488
60°	24567	4484	17114
65°	8817	3512	13225
70°	1108	2216	7663
75°	1464	1464	0
80°	0	0	0
85°	0	0	0

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	66.4	9.2
10°-20°	171.7	23.9
20°-30°	209.9	29.2
30°-40°	157.1	21.8
40°-50°	77.9	10.8
50°-60°	28.7	4.0
60°-70°	7.1	1.0
70°-80°	1.0	0.1
80°-90°	0.0	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°	448.0	62.2
0°-40°	605.1	84.1
0°-60°	711.7	98.9
0°-90°	719.8	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	719.8	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	720	720	720	720	720	
5°	926	833	695	570	533	97
15°	1392	875	457	277	252	396
25°	1554	624	244	123	129	697
35°	1017	300	106	57	81	641
45°	421	98	38	32	55	336
55°	106	27	15	13	35	101
65°	12	4	5	5	18	14
75°	1	1	1	0	0	1
85°	0	0	0	0	0	0
90°	0	0	0	0	0	

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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	45°	67.5°	90°	112.5°	135°
0°	719.6	719.6	719.6	719.6	719.6	719.6	719.6	719.6	719.6	719.6	719.6
2.5°	810.5	810.5	819.9	804.6	804.6	799.9	765.6	745.6	723.2	690.1	651.2
5°	926.1	949.7	930.8	904.9	920.2	913.1	832.9	759.7	694.9	631.2	569.8
7.5°	1074.7	1080.6	1064.1	1031.1	1024.0	1019.3	881.3	760.9	647.7	552.1	481.3
10°	1178.6	1186.8	1179.7	1167.9	1127.8	1118.4	896.6	716.1	585.1	483.7	398.7
12.5°	1311.9	1309.5	1298.9	1264.7	1218.7	1205.7	887.2	676.0	519.1	407.0	326.8
15°	1392.1	1406.2	1390.9	1300.1	1278.8	1245.8	875.4	621.7	456.6	352.7	277.2
17.5°	1461.7	1455.8	1426.3	1368.5	1314.2	1284.7	829.4	542.7	401.1	293.8	228.9
20°	1528.9	1530.1	1484.1	1413.3	1326.0	1272.9	760.9	488.4	342.1	241.8	189.9
22.5°	1559.6	1557.2	1498.3	1393.3	1291.8	1237.5	696.0	427.1	286.7	195.8	152.2
25°	1553.7	1511.2	1472.3	1348.4	1234.0	1167.9	624.1	374.0	244.2	165.2	122.7
27.5°	1478.2	1457.0	1390.9	1267.0	1134.9	1067.7	534.4	319.7	204.1	129.8	100.3
30°	1368.5	1343.7	1264.7	1162.0	988.6	935.5	455.4	261.9	166.3	110.9	82.6
32.5°	1205.7	1186.8	1105.4	970.9	835.2	775.1	377.5	208.8	134.5	81.4	67.2
35°	1016.9	1015.7	943.8	834.1	692.5	631.2	299.7	167.5	106.2	64.9	56.6
37.5°	873.0	842.3	771.5	670.1	550.9	500.2	234.8	131.0	79.0	50.7	47.2
40°	706.7	693.7	619.4	533.2	428.2	390.5	173.4	97.9	60.2	41.3	42.5
42.5°	568.6	550.9	489.6	405.8	331.5	300.8	132.1	75.5	47.2	35.4	37.8
45°	421.2	412.9	377.5	302.0	245.4	224.1	97.9	59.0	37.8	29.5	31.9
47.5°	306.7	297.3	272.5	224.1	178.1	165.2	75.5	46.0	30.7	23.6	24.8
50°	224.1	218.3	201.7	162.8	131.0	120.3	56.6	35.4	24.8	18.9	21.2
52.5°	154.5	156.9	142.7	115.6	93.2	86.1	42.5	26.0	20.1	15.3	17.7
55°	106.2	103.8	97.9	75.5	60.2	55.4	27.1	17.7	15.3	11.8	13.0
57.5°	64.9	64.9	60.2	47.2	37.8	35.4	16.5	11.8	10.6	8.3	10.6
60°	38.9	38.9	33.0	27.1	22.4	20.1	9.4	7.1	7.1	5.9	8.3
62.5°	21.2	21.2	18.9	15.3	11.8	10.6	5.9	5.9	4.7	4.7	7.1
65°	11.8	10.6	9.4	7.1	5.9	5.9	3.5	4.7	4.7	4.7	4.7
67.5°	4.7	4.7	4.7	3.5	3.5	3.5	2.4	3.5	3.5	3.5	3.5
70°	1.2	2.4	2.4	2.4	1.2	1.2	2.4	2.4	2.4	2.4	2.4
72.5°	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
75°	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.0
77.5°	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	0.0	0.0	0.0
80°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	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):

	157.5°	180°
0°	719.6	719.6
2.5°	652.4	641.8
5°	546.2	533.2
7.5°	434.1	425.9
10°	355.1	349.2
12.5°	299.7	296.1
15°	253.6	252.5
17.5°	213.5	210.0
20°	174.6	178.1
22.5°	143.9	141.6
25°	121.5	128.6
27.5°	103.8	113.3
30°	90.8	99.1
32.5°	77.9	90.8
35°	68.4	81.4
37.5°	61.3	73.1
40°	56.6	67.2
42.5°	49.5	62.5
45°	43.7	55.4
47.5°	37.8	49.5
50°	34.2	44.8
52.5°	29.5	40.1
55°	24.8	35.4
57.5°	22.4	31.9
60°	18.9	27.1
62.5°	14.2	22.4
65°	10.6	17.7
67.5°	7.1	13.0
70°	3.5	8.3
72.5°	1.2	2.4
75°	0.0	0.0
77.5°	0.0	0.0
80°	0.0	0.0
82.5°	0.0	0.0
85°	0.0	0.0
87.5°	0.0	0.0
90°	0.0	0.0

(END OF REPORT)