

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: P601278

Luminaire Tested: **ML410LSAWW9FS1E - TIR4D25AWW - TL41R_ TL42S_ 5000K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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Test Information

Test Method: LM-79-08
 Report Number: P601278
 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_ 5000K
 Description: RETROFIT, 25D WW OPTIC, OPEN TRIM
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 5000K CCT
 Ballast/Driver: -

Summary

Lumens per Lamp: N/A
 Luminaire Lumens: 752.2 lumens
 Efficiency: N/A
 Efficacy: 62.7 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

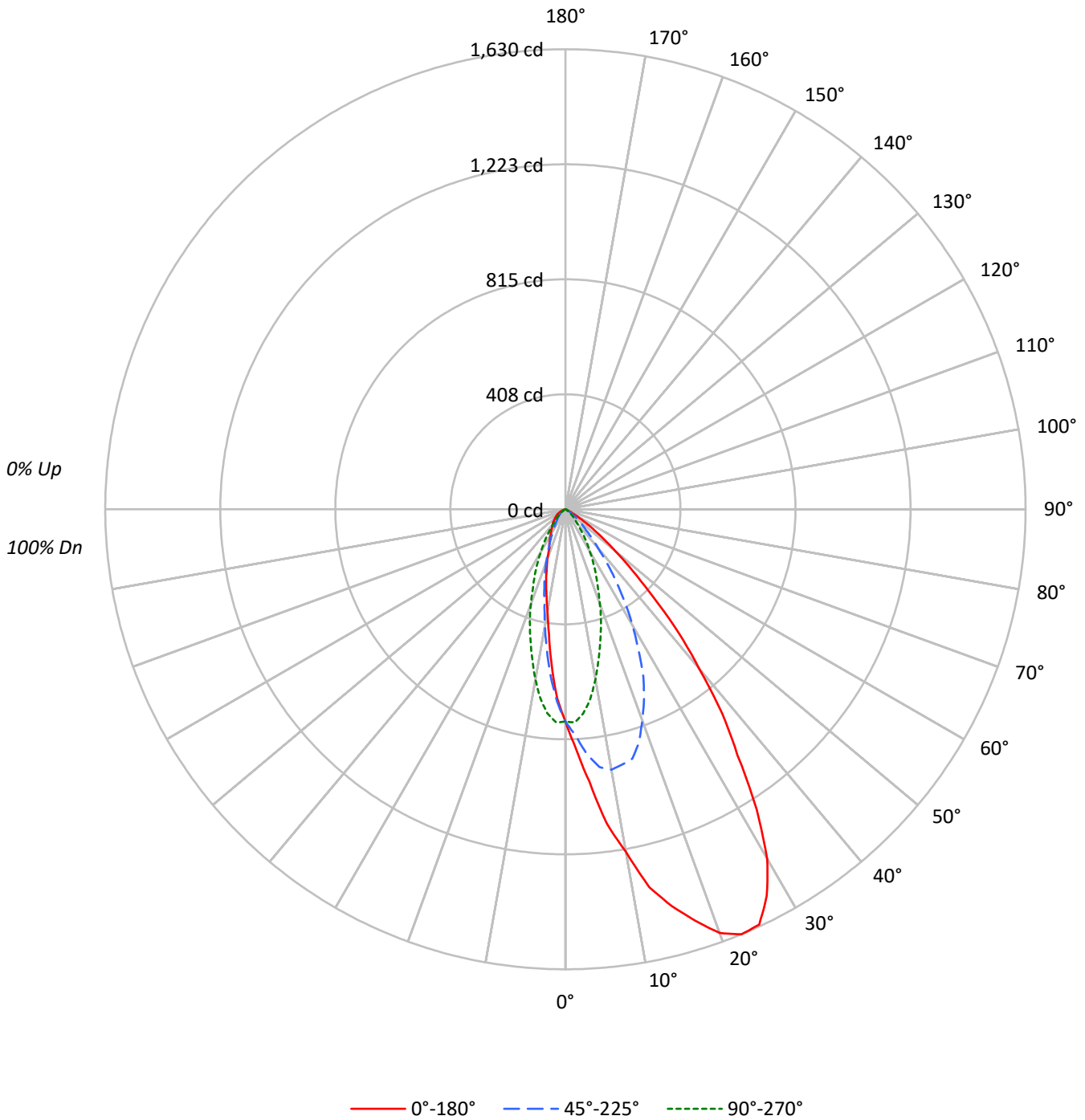
Input Watts (W): 12
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



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

TEST NUMBER: P601278
CATALOG NUMBER: ML410LSAWW9FS1E - TIR4D25AWW - TL41R_TL42S_5000K

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

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	237487	237487	237487
5°	306765	230185	176648
10°	394928	196069	117000
15°	475580	155966	86237
20°	536909	120131	62569
25°	565711	88914	46826
30°	521471	63370	37774
35°	409686	42788	32804
40°	304411	25928	28978
45°	196531	17639	25856
50°	115098	12723	23039
55°	61108	8808	20369
60°	25703	4673	17935
65°	9190	3661	13823
70°	1108	2308	7940
75°	1464	1464	0
80°	0	0	0
85°	0	0	0

TEST NUMBER: P601278

CATALOG NUMBER: ML410LSAWW9FS1E - TIR4D25AWW - TL41R_ TL42S_ 5000K

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	69.4	9.2
10°-20°	179.5	23.9
20°-30°	219.4	29.2
30°-40°	164.2	21.8
40°-50°	81.4	10.8
50°-60°	30.0	4.0
60°-70°	7.5	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°	468.2	62.2
0°-40°	632.4	84.1
0°-60°	743.7	98.9
0°-90°	752.2	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	752.2	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	752	752	752	752	752	
5°	968	870	726	596	557	101
15°	1455	915	477	290	264	414
25°	1624	652	255	128	134	728
35°	1063	313	111	59	85	670
45°	440	102	40	33	58	351
55°	111	28	16	14	37	106
65°	12	4	5	5	18	15
75°	1	1	1	0	0	1
85°	0	0	0	0	0	0
90°	0	0	0	0	0	

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CATALOG NUMBER: ML410LSAWW9FS1E - TIR4D25AWW - TL41R_ TL42S_ 5000K

CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	45°	67.5°	90°	112.5°	135°
0°	752.1	752.1	752.1	752.1	752.1	752.1	752.1	752.1	752.1	752.1	752.1
2.5°	847.0	847.0	856.9	840.8	840.8	835.9	800.2	779.2	755.8	721.3	680.6
5°	967.8	992.5	972.8	945.6	961.7	954.3	870.4	794.0	726.2	659.6	595.5
7.5°	1123.2	1129.3	1112.1	1077.6	1070.2	1065.2	921.0	795.2	676.9	577.0	503.0
10°	1231.7	1240.3	1232.9	1220.6	1178.7	1168.8	937.0	748.4	611.5	505.5	416.7
12.5°	1371.0	1368.5	1357.4	1321.7	1273.6	1260.0	927.1	706.5	542.5	425.4	341.5
15°	1454.8	1469.6	1453.6	1358.7	1336.5	1302.0	914.8	649.7	477.1	368.6	289.7
17.5°	1527.6	1521.4	1490.6	1430.2	1373.5	1342.6	866.7	567.1	419.2	307.0	239.2
20°	1597.8	1599.1	1551.0	1477.0	1385.8	1330.3	795.2	510.4	357.5	252.7	198.5
22.5°	1629.9	1627.4	1565.8	1456.1	1350.0	1293.3	727.4	446.3	299.6	204.7	159.0
25°	1623.7	1579.4	1538.7	1409.2	1289.6	1220.6	652.2	390.8	255.2	172.6	128.2
27.5°	1544.8	1522.6	1453.6	1324.1	1186.1	1115.8	558.5	334.1	213.3	135.6	104.8
30°	1430.2	1404.3	1321.7	1214.4	1033.2	977.7	475.9	273.7	173.8	115.9	86.3
32.5°	1260.0	1240.3	1155.2	1014.7	872.9	810.0	394.5	218.2	140.6	85.1	70.3
35°	1062.8	1061.5	986.3	871.7	723.7	659.6	313.2	175.1	111.0	67.8	59.2
37.5°	912.4	880.3	806.3	700.3	575.8	522.8	245.3	136.9	82.6	53.0	49.3
40°	738.5	725.0	647.3	557.3	447.5	408.1	181.2	102.3	62.9	43.2	44.4
42.5°	594.3	575.8	511.7	424.1	346.4	314.4	138.1	78.9	49.3	37.0	39.5
45°	440.1	431.5	394.5	315.6	256.4	234.3	102.3	61.6	39.5	30.8	33.3
47.5°	320.6	310.7	284.8	234.3	186.2	172.6	78.9	48.1	32.1	24.7	25.9
50°	234.3	228.1	210.8	170.1	136.9	125.8	59.2	37.0	25.9	19.7	22.2
52.5°	161.5	164.0	149.2	120.8	97.4	90.0	44.4	27.1	21.0	16.0	18.5
55°	111.0	108.5	102.3	78.9	62.9	57.9	28.4	18.5	16.0	12.3	13.6
57.5°	67.8	67.8	62.9	49.3	39.5	37.0	17.3	12.3	11.1	8.6	11.1
60°	40.7	40.7	34.5	28.4	23.4	21.0	9.9	7.4	7.4	6.2	8.6
62.5°	22.2	22.2	19.7	16.0	12.3	11.1	6.2	6.2	4.9	4.9	7.4
65°	12.3	11.1	9.9	7.4	6.2	6.2	3.7	4.9	4.9	4.9	4.9
67.5°	4.9	4.9	4.9	3.7	3.7	3.7	2.5	3.7	3.7	3.7	3.7
70°	1.2	2.5	2.5	2.5	1.2	1.2	2.5	2.5	2.5	2.5	2.5
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°	752.1	752.1
2.5°	681.8	670.7
5°	570.8	557.3
7.5°	453.7	445.1
10°	371.1	364.9
12.5°	313.2	309.5
15°	265.1	263.8
17.5°	223.2	219.5
20°	182.5	186.2
22.5°	150.4	147.9
25°	127.0	134.4
27.5°	108.5	118.4
30°	94.9	103.6
32.5°	81.4	94.9
35°	71.5	85.1
37.5°	64.1	76.4
40°	59.2	70.3
42.5°	51.8	65.3
45°	45.6	57.9
47.5°	39.5	51.8
50°	35.8	46.9
52.5°	30.8	41.9
55°	25.9	37.0
57.5°	23.4	33.3
60°	19.7	28.4
62.5°	14.8	23.4
65°	11.1	18.5
67.5°	7.4	13.6
70°	3.7	8.6
72.5°	1.2	2.5
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)