

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: P601279

Luminaire Tested: **ML410LSAWW9FS1E - TIR4D25AWW - TL43R2G_ TL44S2G_ 2700K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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Test Information

Test Method: LM-79-08
 Report Number: P601279
 Test Lab: COOPER LIGHTING SOLUTIONS
 Issue Date: 7/29/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: HALO
 Catalog Number: ML410LSAWW9FS1E - TIR4D25AWW - TL43R2G_ TL44S2G_ 2700K
 Description: RETROFIT, 25D WW OPTIC, DIFFUSE CLEAR LENS TRIM
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 2700K CCT
 Ballast/Driver: -

Summary

Lumens per Lamp: N/A
 Luminaire Lumens: 793.8 lumens
 Efficiency: N/A
 Efficacy: 66.1 lumens/watt
 Spacing Criteria (0/90/45): 1.33 / 0.62 / 0.83
 Luminous Opening: Circular (Dia: 0.21' x H: 0')
 CIE Type: Direct

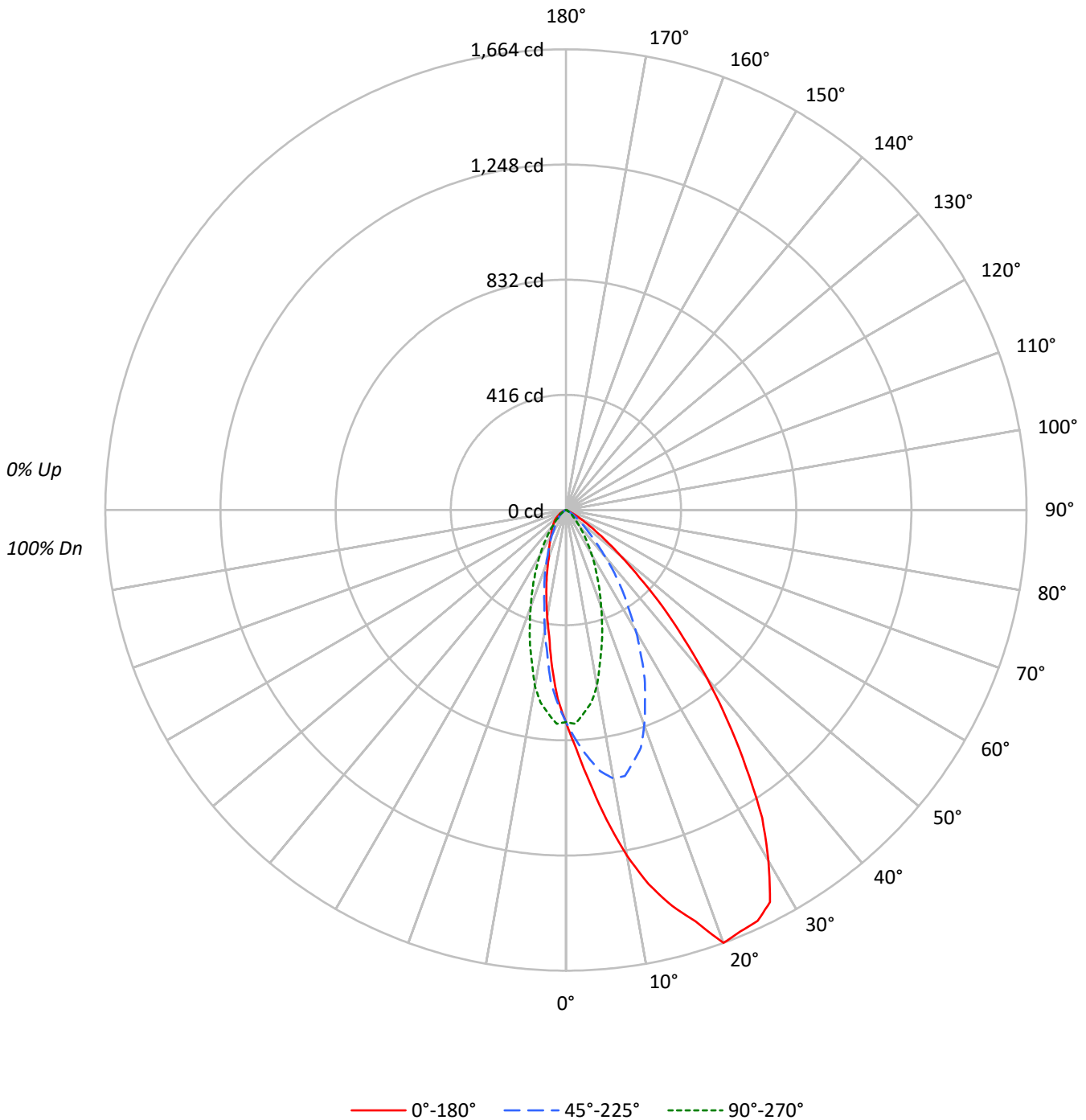
Input Watts (W): 12
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



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	110	108	105	103	104	102	100	100	98	97	97	95	94	92
2	107	101	97	93	104	100	96	92	96	93	90	93	91	88	91	88	86	85
3	101	94	88	84	99	92	87	83	89	85	82	87	83	80	85	82	79	78
4	95	87	81	76	93	85	80	75	83	78	75	81	77	74	79	76	73	71
5	89	80	74	69	88	79	73	69	78	72	68	76	71	68	74	70	67	65
6	84	75	68	64	83	74	68	63	72	67	63	71	66	62	70	65	62	60
7	80	70	63	59	78	69	63	58	68	62	58	66	62	58	65	61	57	56
8	76	65	59	54	74	65	58	54	64	58	54	62	57	54	61	57	53	52
9	72	61	55	51	70	61	55	50	60	54	50	59	54	50	58	53	50	48
10	68	58	51	47	67	57	51	47	56	51	47	55	50	47	55	50	47	45

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	241845	241845	241845
5°	312819	233640	180579
10°	406246	206843	124567
15°	483720	163779	88853
20°	559054	124533	59948
25°	570553	93722	49265
30°	533504	68073	38540
35°	437595	46026	34385
40°	326464	30008	30008
45°	220064	20229	26347
50°	128804	14836	22941
55°	67989	10570	18112
60°	32966	6063	13894
65°	13300	4109	9265
70°	6370	2493	5078
75°	3294	1708	0
80°	2546	2546	0
85°	0	0	0

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	71.2	9.0
10°-20°	184.1	23.2
20°-30°	225.5	28.4
30°-40°	176.7	22.3
40°-50°	91.1	11.5
50°-60°	34.6	4.4
60°-70°	8.8	1.1
70°-80°	1.8	0.2
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°	480.7	60.6
0°-40°	657.4	82.8
0°-60°	783.1	98.7
0°-90°	793.8	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	793.8	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	766	766	766	766	766	
5°	987	894	737	625	570	103
15°	1480	942	501	301	272	423
25°	1638	673	269	140	141	744
35°	1135	357	119	66	89	704
45°	493	124	45	36	59	383
55°	124	38	19	16	33	120
65°	18	7	6	6	12	22
75°	3	1	1	1	0	3
85°	0	0	0	0	0	0
90°	0	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°	765.9	765.9	765.9	765.9	765.9	765.9	765.9	765.9	765.9	765.9	765.9
2.5°	863.4	859.3	881.2	849.7	829.1	856.5	831.8	803.0	772.8	722.0	695.9
5°	986.9	989.7	993.8	984.2	980.1	977.3	893.6	815.4	737.1	660.2	624.6
7.5°	1128.3	1102.2	1118.7	1081.7	1088.5	1069.3	951.2	803.0	701.4	602.6	518.9
10°	1267.0	1238.1	1251.9	1217.5	1209.3	1192.8	984.2	770.1	645.1	512.0	440.6
12.5°	1385.0	1372.7	1358.9	1312.3	1295.8	1250.5	984.2	726.1	565.5	442.0	359.6
15°	1479.7	1467.4	1452.3	1391.9	1341.1	1301.3	941.6	664.4	501.0	378.9	300.6
17.5°	1558.0	1509.9	1511.3	1424.8	1380.9	1328.7	900.5	601.2	433.8	317.1	255.3
20°	1663.7	1575.8	1560.7	1468.7	1386.4	1328.7	827.7	532.6	370.6	267.7	210.0
22.5°	1647.2	1568.9	1586.8	1450.9	1363.0	1339.7	746.7	459.8	318.5	225.1	168.8
25°	1637.6	1581.3	1551.1	1405.6	1299.9	1225.8	672.6	402.2	269.0	185.3	140.0
27.5°	1596.4	1511.3	1466.0	1319.1	1202.4	1142.0	584.8	340.4	225.1	146.9	118.0
30°	1463.2	1401.5	1353.4	1199.7	1076.2	1018.5	506.5	282.8	186.7	120.8	93.3
32.5°	1319.1	1265.6	1191.5	1065.2	923.8	867.5	420.0	241.6	152.4	96.1	78.2
35°	1135.2	1091.3	1021.3	893.6	757.7	733.0	356.9	193.5	119.4	76.9	65.9
37.5°	956.7	918.3	846.9	731.6	625.9	590.2	288.3	155.1	96.1	63.1	56.3
40°	792.0	746.7	700.1	587.5	501.0	462.6	221.0	120.8	72.8	50.8	48.0
42.5°	630.0	602.6	551.8	469.4	384.3	359.6	164.7	90.6	57.7	42.6	41.2
45°	492.8	464.0	415.9	361.0	289.6	270.4	123.5	70.0	45.3	34.3	35.7
47.5°	359.6	345.9	314.3	267.7	221.0	199.0	93.3	54.9	35.7	28.8	30.2
50°	262.2	248.5	233.4	190.8	153.7	148.2	70.0	42.6	30.2	23.3	24.7
52.5°	181.2	179.8	163.3	135.9	112.6	102.9	53.5	32.9	24.7	19.2	20.6
55°	123.5	122.2	111.2	94.7	79.6	72.8	38.4	24.7	19.2	15.1	16.5
57.5°	79.6	81.0	74.1	64.5	52.2	48.0	26.1	17.8	13.7	11.0	12.4
60°	52.2	52.2	45.3	41.2	32.9	30.2	17.8	12.4	9.6	8.2	9.6
62.5°	31.6	32.9	28.8	23.3	20.6	17.8	11.0	8.2	6.9	5.5	6.9
65°	17.8	19.2	16.5	13.7	12.4	11.0	6.9	5.5	5.5	4.1	5.5
67.5°	11.0	11.0	9.6	8.2	6.9	6.9	4.1	4.1	4.1	4.1	4.1
70°	6.9	6.9	5.5	5.5	4.1	4.1	2.7	4.1	2.7	2.7	2.7
72.5°	4.1	4.1	2.7	2.7	2.7	2.7	2.7	2.7	2.7	1.4	1.4
75°	2.7	2.7	2.7	2.7	1.4	1.4	1.4	1.4	1.4	1.4	1.4
77.5°	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	0.0
80°	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	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°	765.9	765.9
2.5°	679.5	682.2
5°	586.1	569.7
7.5°	487.3	461.2
10°	394.0	388.5
12.5°	332.2	325.3
15°	278.6	271.8
17.5°	233.4	221.0
20°	194.9	178.4
22.5°	162.0	163.3
25°	138.6	141.4
27.5°	119.4	122.2
30°	100.2	105.7
32.5°	90.6	98.8
35°	78.2	89.2
37.5°	70.0	81.0
40°	61.8	72.8
42.5°	54.9	65.9
45°	48.0	59.0
47.5°	42.6	53.5
50°	35.7	46.7
52.5°	30.2	39.8
55°	24.7	32.9
57.5°	20.6	27.5
60°	16.5	22.0
62.5°	12.4	16.5
65°	8.2	12.4
67.5°	5.5	8.2
70°	4.1	5.5
72.5°	1.4	2.7
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)