

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: P601282

Luminaire Tested: **ML410LSAWW9FS1E - TIR4D25AWW - TL43R2G_ TL44S2G_ 4000K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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Test Information

Test Method: LM-79-08
 Report Number: P601282
 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_ 4000K
 Description: RETROFIT, 25D WW OPTIC, DIFFUSE CLEAR LENS TRIM
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 4000K CCT
 Ballast/Driver: -

Summary

Lumens per Lamp: N/A
 Luminaire Lumens: 838.6 lumens
 Efficiency: N/A
 Efficacy: 69.9 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

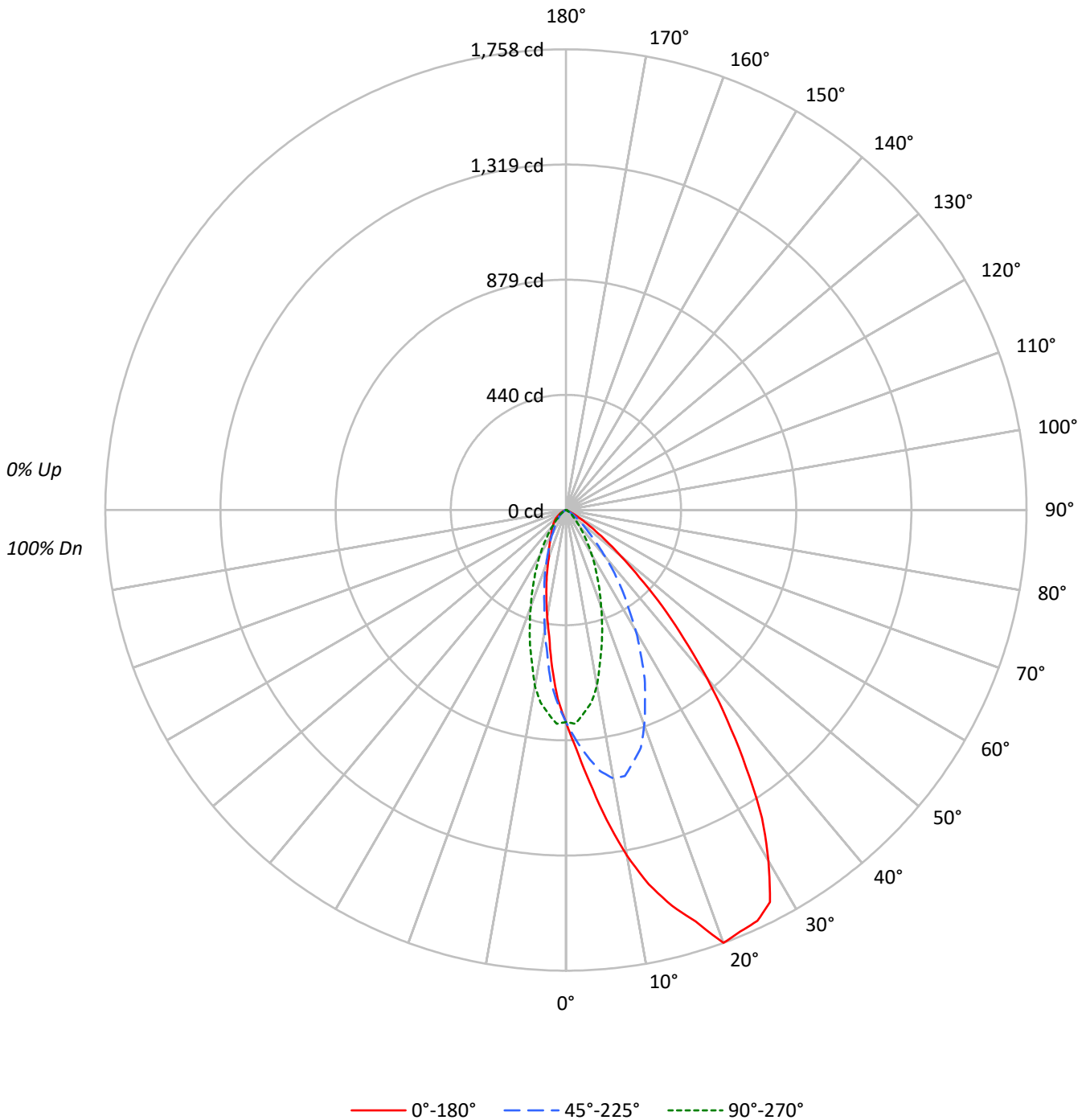
Input Watts (W): 12
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



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	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	98	97	97	95	94	92	92	92	85					
1	113	110	107	105	110	108	105	103	104	102	100	100	98	97	97	95	94	92	91	88	86	85	85	85	85	85	85	85				
2	107	101	97	93	104	100	96	92	96	93	90	93	91	88	91	88	86	85	87	83	80	85	82	79	78	78	78	78				
3	101	94	88	84	99	92	87	83	89	85	82	87	83	80	85	82	79	78	87	83	80	85	82	79	78	78	78	78				
4	95	87	81	76	93	85	80	75	83	78	75	81	77	74	79	76	73	71	81	77	74	79	76	73	71	71	71	71				
5	89	80	74	69	88	79	73	69	78	72	68	76	71	68	74	70	67	65	76	71	68	74	70	67	65	65	65	65				
6	84	75	68	64	83	74	68	63	72	67	63	71	66	62	70	65	62	60	71	66	62	70	65	62	60	60	60	60				
7	80	70	63	59	78	69	63	58	68	62	58	66	62	58	65	61	57	56	66	62	58	65	61	57	56	56	56	56				
8	76	65	59	54	74	65	58	54	64	58	54	62	57	54	61	57	53	52	64	58	54	61	57	53	52	52	52	52				
9	72	61	55	51	70	61	55	50	60	54	50	59	54	50	58	53	50	48	60	54	50	58	53	50	48	48	48	48				
10	68	58	51	47	67	57	51	47	56	51	47	55	50	47	55	50	47	45	56	51	47	55	50	47	45	45	45	45				

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	255486	255486	255486
5°	330474	246826	190753
10°	429140	218514	131589
15°	511017	173030	93854
20°	590573	131556	63342
25°	602712	99018	52052
30°	563621	71902	40727
35°	462265	48647	36351
40°	344890	31698	31698
45°	232479	21390	27865
50°	136074	15671	24218
55°	71843	11176	19158
60°	34797	6442	14652
65°	14121	4334	9788
70°	6740	2677	5355
75°	3538	1830	0
80°	2728	2728	0
85°	0	0	0

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	75.2	9.0
10°-20°	194.5	23.2
20°-30°	238.2	28.4
30°-40°	186.7	22.3
40°-50°	96.2	11.5
50°-60°	36.5	4.4
60°-70°	9.3	1.1
70°-80°	1.9	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°	507.8	60.6
0°-40°	694.5	82.8
0°-60°	827.3	98.6
0°-90°	838.6	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	838.6	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	809	809	809	809	809	
5°	1043	944	779	660	602	109
15°	1563	995	529	318	287	447
25°	1730	710	284	148	149	786
35°	1199	377	126	70	94	744
45°	521	130	48	38	62	405
55°	130	41	20	17	35	126
65°	19	7	6	6	13	23
75°	3	2	2	2	0	3
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°	809.1	809.1	809.1	809.1	809.1	809.1	809.1	809.1	809.1	809.1	809.1
2.5°	912.1	907.7	930.9	897.6	875.8	904.8	878.7	848.3	816.4	762.7	735.2
5°	1042.6	1045.5	1049.8	1039.7	1035.3	1032.4	944.0	861.3	778.7	697.5	659.8
7.5°	1191.9	1164.4	1181.8	1142.6	1149.9	1129.6	1004.9	848.3	741.0	636.6	548.1
10°	1338.4	1308.0	1322.5	1286.2	1277.5	1260.1	1039.7	813.5	681.5	540.9	465.5
12.5°	1463.1	1450.1	1435.6	1386.3	1368.9	1321.0	1039.7	767.1	597.4	466.9	379.9
15°	1563.2	1550.1	1534.2	1470.4	1416.7	1374.7	994.7	701.8	529.3	400.2	317.6
17.5°	1645.8	1595.1	1596.5	1505.2	1458.8	1403.7	951.2	635.1	458.2	335.0	269.7
20°	1757.5	1664.7	1648.7	1551.6	1464.6	1403.7	874.4	562.6	391.5	282.8	221.9
22.5°	1740.1	1657.4	1676.3	1532.7	1439.9	1415.3	788.8	485.8	336.4	237.8	178.4
25°	1729.9	1670.5	1638.6	1484.9	1373.2	1294.9	710.5	424.9	284.2	195.8	147.9
27.5°	1686.4	1596.5	1548.7	1393.5	1270.3	1206.4	617.7	359.6	237.8	155.2	124.7
30°	1545.8	1480.5	1429.8	1267.4	1136.8	1075.9	535.1	298.7	197.2	127.6	98.6
32.5°	1393.5	1337.0	1258.7	1125.2	975.9	916.4	443.7	255.2	161.0	101.5	82.7
35°	1199.2	1152.8	1078.8	944.0	800.4	774.3	377.0	204.5	126.2	81.2	69.6
37.5°	1010.7	970.1	894.7	772.9	661.2	623.5	304.5	163.9	101.5	66.7	59.5
40°	836.7	788.8	739.5	620.6	529.3	488.7	233.5	127.6	76.9	53.7	50.8
42.5°	665.6	636.6	582.9	495.9	406.0	379.9	174.0	95.7	60.9	45.0	43.5
45°	520.6	490.1	439.4	381.4	306.0	285.7	130.5	74.0	47.9	36.3	37.7
47.5°	379.9	365.4	332.1	282.8	233.5	210.3	98.6	58.0	37.7	30.5	31.9
50°	277.0	262.5	246.5	201.6	162.4	156.6	74.0	45.0	31.9	24.7	26.1
52.5°	191.4	190.0	172.6	143.6	118.9	108.8	56.6	34.8	26.1	20.3	21.8
55°	130.5	129.1	117.5	100.1	84.1	76.9	40.6	26.1	20.3	16.0	17.4
57.5°	84.1	85.6	78.3	68.2	55.1	50.8	27.6	18.9	14.5	11.6	13.1
60°	55.1	55.1	47.9	43.5	34.8	31.9	18.9	13.1	10.2	8.7	10.2
62.5°	33.4	34.8	30.5	24.7	21.8	18.9	11.6	8.7	7.3	5.8	7.3
65°	18.9	20.3	17.4	14.5	13.1	11.6	7.3	5.8	5.8	4.4	5.8
67.5°	11.6	11.6	10.2	8.7	7.3	7.3	4.4	4.4	4.4	4.4	4.4
70°	7.3	7.3	5.8	5.8	4.4	4.4	2.9	4.4	2.9	2.9	2.9
72.5°	4.4	4.4	2.9	2.9	2.9	2.9	2.9	2.9	2.9	1.5	1.5
75°	2.9	2.9	2.9	2.9	1.5	1.5	1.5	1.5	1.5	1.5	1.5
77.5°	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.0
80°	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	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°	809.1	809.1
2.5°	717.8	720.7
5°	619.2	601.8
7.5°	514.8	487.2
10°	416.2	410.4
12.5°	350.9	343.7
15°	294.4	287.1
17.5°	246.5	233.5
20°	205.9	188.5
22.5°	171.1	172.6
25°	146.5	149.4
27.5°	126.2	129.1
30°	105.9	111.7
32.5°	95.7	104.4
35°	82.7	94.3
37.5°	74.0	85.6
40°	65.3	76.9
42.5°	58.0	69.6
45°	50.8	62.4
47.5°	45.0	56.6
50°	37.7	49.3
52.5°	31.9	42.1
55°	26.1	34.8
57.5°	21.8	29.0
60°	17.4	23.2
62.5°	13.1	17.4
65°	8.7	13.1
67.5°	5.8	8.7
70°	4.4	5.8
72.5°	1.5	2.9
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)