

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: P601182

Luminaire Tested: **ML406AWWD2W1E - TIR4D25AWW - TL41R\_ TL42S\_ 3000K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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**Test Information**

Test Method: LM-79-08  
 Report Number: P601182  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Issue Date: 7/29/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: HALO  
 Catalog Number: ML406AWWD2W1E - TIR4D25AWW - TL41R\_ TL42S\_ 3000K  
 Description: RETROFIT, 25D WW OPTIC, OPEN TRIM  
 Light Source: (1) SELECTABLE LUMEN LED D2W / 3000K CCT  
 Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 413.4 lumens  
 Efficiency: N/A  
 Efficacy: 49.8 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

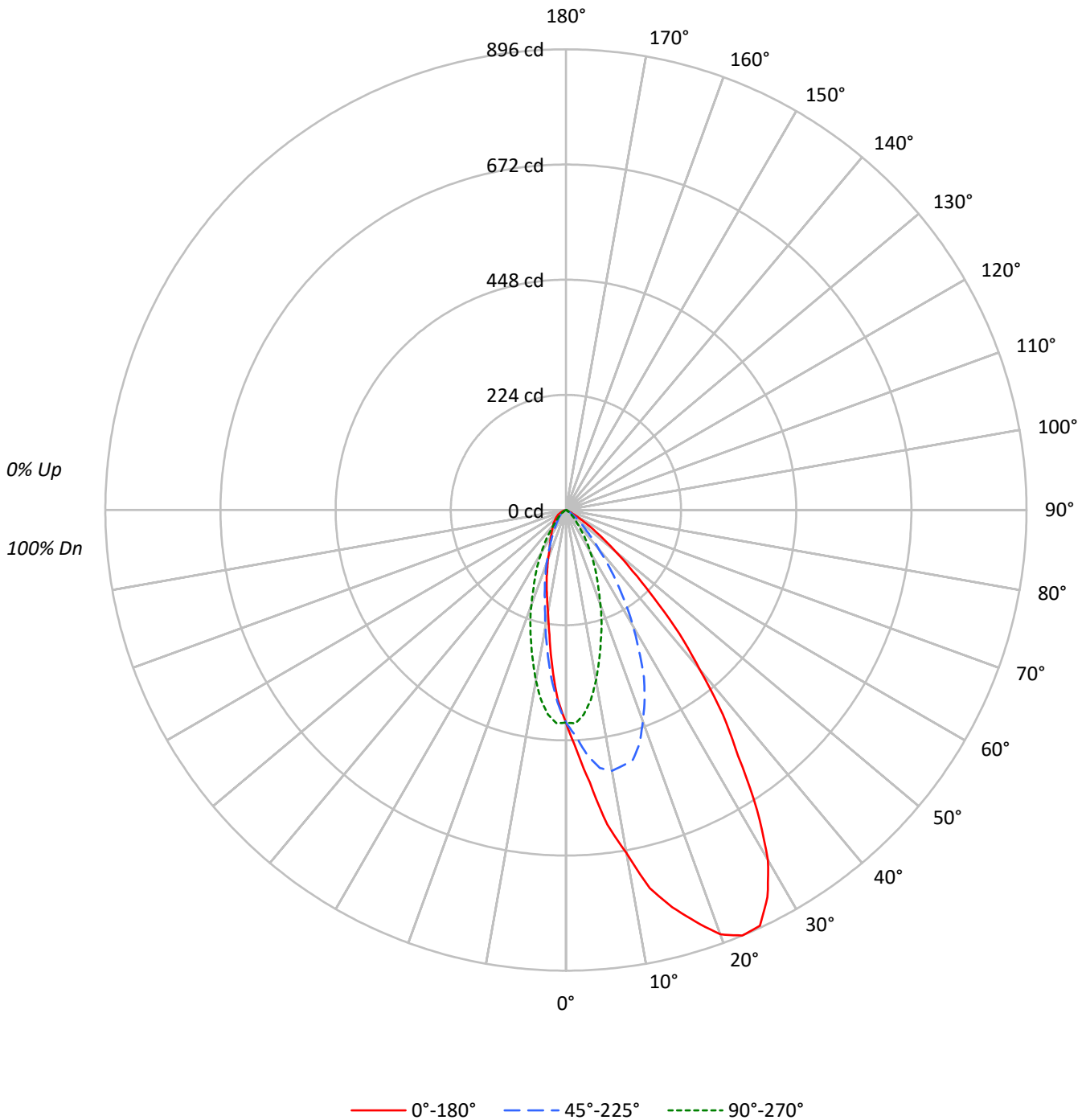
Input Watts (W): 8.3  
 Input Voltage (V): NR  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: NR  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 25 FT



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

**AVERAGE LUMINANCE (cd/sqm):**

	0°	90°	180°
0°	130537	130537	130537
5°	168597	126503	97088
10°	217071	107766	64320
15°	261393	85714	47401
20°	295102	66030	34376
25°	310920	48882	25747
30°	286623	34821	20747
35°	225158	23514	18040
40°	167313	14262	15911
45°	108023	9690	14201
50°	63223	6976	12625
55°	33582	4845	11176
60°	14146	2589	9852
65°	5081	2017	7621
70°	646	1293	4339
75°	854	854	0
80°	0	0	0
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	38.1	9.2
10°-20°	98.6	23.9
20°-30°	120.6	29.2
30°-40°	90.2	21.8
40°-50°	44.7	10.8
50°-60°	16.5	4.0
60°-70°	4.1	1.0
70°-80°	0.6	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°	257.3	62.2
0°-40°	347.6	84.1
0°-60°	408.8	98.9
0°-90°	413.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	413.4	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	413	413	413	413	413	
5°	532	478	399	327	306	56
15°	800	503	262	159	145	227
25°	892	358	140	70	74	400
35°	584	172	61	32	47	368
45°	242	56	22	18	32	193
55°	61	16	9	8	20	58
65°	7	2	3	3	10	8
75°	1	1	1	0	0	0
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°	413.4	413.4	413.4	413.4	413.4	413.4	413.4	413.4	413.4	413.4	413.4
2.5°	465.5	465.5	471.0	462.1	462.1	459.4	439.8	428.3	415.4	396.4	374.1
5°	531.9	545.5	534.7	519.7	528.6	524.5	478.4	436.4	399.1	362.5	327.3
7.5°	617.3	620.7	611.2	592.2	588.2	585.5	506.2	437.1	372.0	317.1	276.5
10°	677.0	681.7	677.6	670.9	647.8	642.4	515.0	411.3	336.1	277.8	229.0
12.5°	753.5	752.2	746.1	726.4	700.0	692.5	509.6	388.3	298.2	233.8	187.7
15°	799.6	807.7	798.9	746.7	734.6	715.6	502.8	357.1	262.2	202.6	159.2
17.5°	839.6	836.2	819.3	786.1	754.9	737.9	476.4	311.7	230.4	168.7	131.5
20°	878.2	878.9	852.5	811.8	761.7	731.2	437.1	280.5	196.5	138.9	109.1
22.5°	895.8	894.5	860.6	800.3	742.0	710.8	399.8	245.3	164.7	112.5	87.4
25°	892.4	868.0	845.7	774.5	708.8	670.9	358.5	214.8	140.3	94.9	70.5
27.5°	849.1	836.9	798.9	727.8	651.9	613.3	307.0	183.6	117.2	74.5	57.6
30°	786.1	771.8	726.4	667.5	567.9	537.4	261.6	150.4	95.5	63.7	47.4
32.5°	692.5	681.7	634.9	557.7	479.8	445.2	216.8	119.9	77.2	46.8	38.6
35°	584.1	583.4	542.1	479.1	397.8	362.5	172.1	96.2	61.0	37.3	32.5
37.5°	501.4	483.8	443.2	384.9	316.5	287.3	134.8	75.2	45.4	29.1	27.1
40°	405.9	398.4	355.8	306.3	246.0	224.3	99.6	56.2	34.6	23.7	24.4
42.5°	326.6	316.5	281.2	233.1	190.4	172.8	75.9	43.4	27.1	20.3	21.7
45°	241.9	237.2	216.8	173.5	140.9	128.7	56.2	33.9	21.7	16.9	18.3
47.5°	176.2	170.8	156.5	128.7	102.3	94.9	43.4	26.4	17.6	13.6	14.2
50°	128.7	125.4	115.9	93.5	75.2	69.1	32.5	20.3	14.2	10.8	12.2
52.5°	88.8	90.1	82.0	66.4	53.5	49.5	24.4	14.9	11.5	8.8	10.2
55°	61.0	59.6	56.2	43.4	34.6	31.8	15.6	10.2	8.8	6.8	7.5
57.5°	37.3	37.3	34.6	27.1	21.7	20.3	9.5	6.8	6.1	4.7	6.1
60°	22.4	22.4	19.0	15.6	12.9	11.5	5.4	4.1	4.1	3.4	4.7
62.5°	12.2	12.2	10.8	8.8	6.8	6.1	3.4	3.4	2.7	2.7	4.1
65°	6.8	6.1	5.4	4.1	3.4	3.4	2.0	2.7	2.7	2.7	2.7
67.5°	2.7	2.7	2.7	2.0	2.0	2.0	1.4	2.0	2.0	2.0	2.0
70°	0.7	1.4	1.4	1.4	0.7	0.7	1.4	1.4	1.4	1.4	1.4
72.5°	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
75°	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.0
77.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	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°	413.4	413.4
2.5°	374.7	368.6
5°	313.7	306.3
7.5°	249.4	244.6
10°	204.0	200.6
12.5°	172.1	170.1
15°	145.7	145.0
17.5°	122.7	120.6
20°	100.3	102.3
22.5°	82.7	81.3
25°	69.8	73.9
27.5°	59.6	65.1
30°	52.2	56.9
32.5°	44.7	52.2
35°	39.3	46.8
37.5°	35.2	42.0
40°	32.5	38.6
42.5°	28.5	35.9
45°	25.1	31.8
47.5°	21.7	28.5
50°	19.7	25.7
52.5°	16.9	23.0
55°	14.2	20.3
57.5°	12.9	18.3
60°	10.8	15.6
62.5°	8.1	12.9
65°	6.1	10.2
67.5°	4.1	7.5
70°	2.0	4.7
72.5°	0.7	1.4
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)