

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: P601436

Luminaire Tested: **ML4DM10LSAWW9FS1E - TIR4D25AWW - TL43R2G\_ TL44S2G\_ 5000K**

Issue Date: 7/29/2022

Tested By:

Approved By:



Cooper Lighting Solutions laboratories have been accredited by National Voluntary Laboratory Accreditation Program (NVLAP) that it adheres to the requirements of ISO/IEC 17025:2005 and appropriate IESNA test methods. This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government. Results contained in this report are valid for luminaire sample tested, as supplied by requestor. Information related to the luminaire tested has been supplied by requestor and can affect the validity of the test results. Report shall not be reproduced except in full without approval of Cooper Lighting Solutions Lighting Laboratory. Test performed at address noted above.

**Test Information**

Test Method: LM-79-08  
 Report Number: P601436  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Issue Date: 7/29/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: HALO  
 Catalog Number: ML4DM10LSAWW9FS1E - TIR4D25AWW - TL43R2G\_ TL44S2G\_ 5000K  
 Description: DIRECT MOUNT, 25D WW OPTIC, DIFFUSE CLEAR LENS TRIM  
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 5000K CCT  
 Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 876.3 lumens  
 Efficiency: N/A  
 Efficacy: 73.0 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

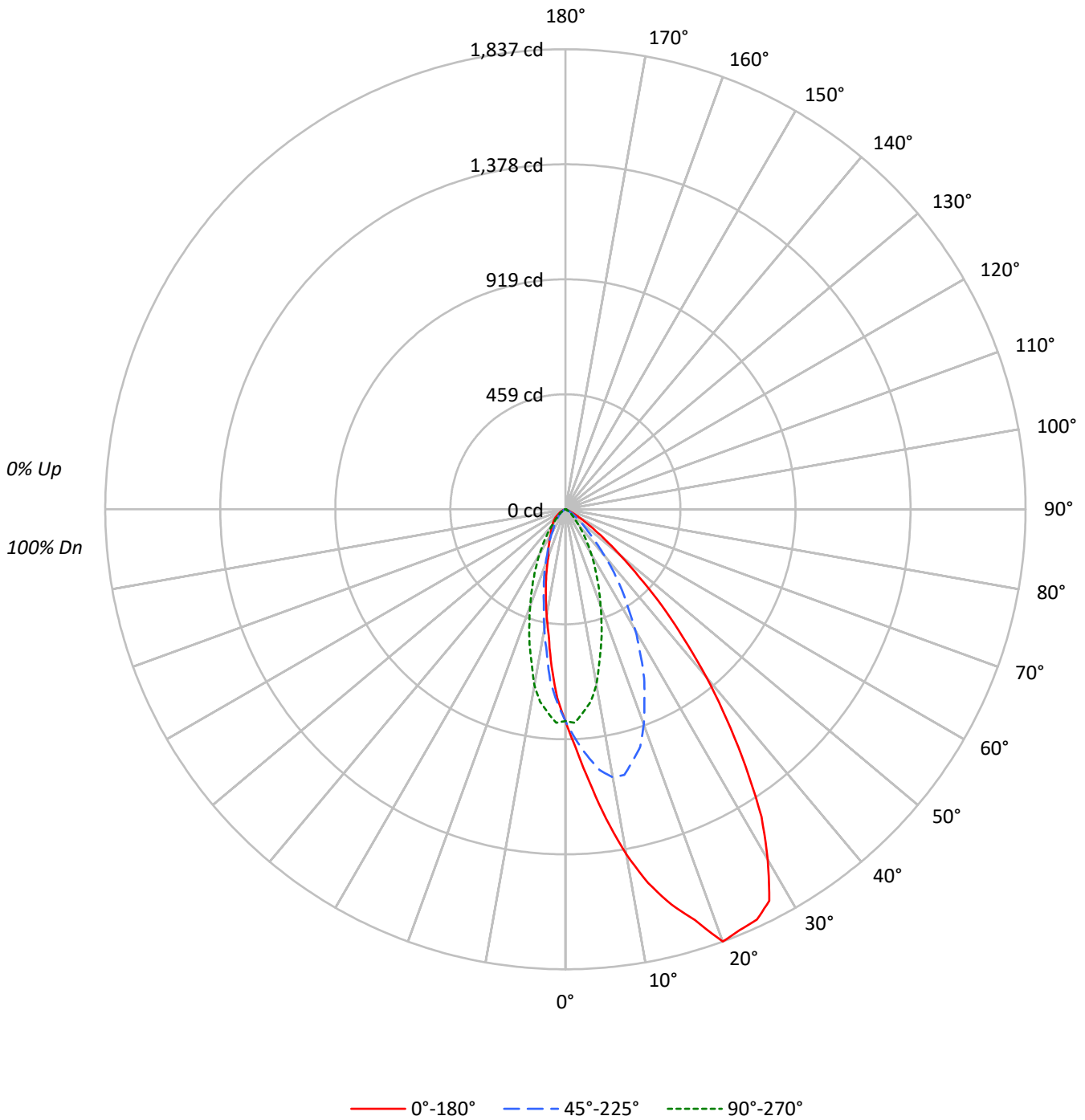
Input Watts (W): 12  
 Input Voltage (V): NR  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: NR  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 25 FT



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

TEST NUMBER: P601436  
CATALOG NUMBER: ML4DM10LSAWW9FS1E - TIR4D25AWW - TL43R2G\_ TL44S2G\_ 5000K

### Luminous Intensity Polar Plot



TEST NUMBER: P601436

CATALOG NUMBER: ML4DM10LSAWW9FS1E - TIR4D25AWW - TL43R2G\_ TL44S2G\_ 5000K

**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	59	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°	267011	267011	267011
5°	345372	257951	199343
10°	448474	228357	137521
15°	534031	180811	98104
20°	617187	137504	66198
25°	629887	103477	54387
30°	588998	75147	42550
35°	483120	50806	37970
40°	360430	33100	33100
45°	242928	22328	29116
50°	142166	16358	25299
55°	75091	11671	20039
60°	36376	6694	15283
65°	14719	4558	10161
70°	7017	2770	5632
75°	3660	1830	0
80°	2728	2728	0
85°	0	0	0

TEST NUMBER: P601436

CATALOG NUMBER: ML4DM10LSAWW9FS1E - TIR4D25AWW - TL43R2G\_ TL44S2G\_ 5000K

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	78.6	9.0
10°-20°	203.2	23.2
20°-30°	248.9	28.4
30°-40°	195.1	22.3
40°-50°	100.5	11.5
50°-60°	38.1	4.4
60°-70°	9.7	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°	530.7	60.6
0°-40°	725.8	82.8
0°-60°	864.5	98.7
0°-90°	876.3	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	876.3	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	846	846	846	846	846	
5°	1090	986	814	690	629	114
15°	1634	1040	553	332	300	467
25°	1808	743	297	155	156	821
35°	1253	394	132	73	98	778
45°	544	136	50	39	65	423
55°	136	42	21	18	36	132
65°	20	8	6	6	14	24
75°	3	2	2	2	0	4
85°	0	0	0	0	0	0
90°	0	0	0	0	0	

TEST NUMBER: P601436

CATALOG NUMBER: ML4DM10LSAWW9FS1E - TIR4D25AWW - TL43R2G\_ TL44S2G\_ 5000K

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	45°	67.5°	90°	112.5°	135°
0°	845.6	845.6	845.6	845.6	845.6	845.6	845.6	845.6	845.6	845.6	845.6
2.5°	953.2	948.7	972.9	938.0	915.3	945.6	918.3	886.5	853.2	797.1	768.3
5°	1089.6	1092.6	1097.2	1086.6	1082.0	1079.0	986.5	900.2	813.8	728.9	689.5
7.5°	1245.7	1216.9	1235.1	1194.2	1201.7	1180.5	1050.2	886.5	774.4	665.3	572.8
10°	1398.7	1366.9	1382.1	1344.2	1335.1	1316.9	1086.6	850.2	712.2	565.3	486.5
12.5°	1529.1	1515.4	1500.3	1448.7	1430.6	1380.6	1086.6	801.7	624.4	488.0	397.0
15°	1633.6	1620.0	1603.3	1536.6	1480.6	1436.6	1039.6	733.5	553.1	418.3	331.9
17.5°	1720.0	1667.0	1668.5	1573.0	1524.5	1466.9	994.1	663.8	478.9	350.1	281.9
20°	1836.7	1739.7	1723.0	1621.5	1530.6	1466.9	913.8	588.0	409.2	295.5	231.9
22.5°	1818.5	1732.1	1751.8	1601.8	1504.8	1479.1	824.4	507.7	351.6	248.5	186.4
25°	1807.9	1745.8	1712.4	1551.8	1435.1	1353.3	742.6	444.0	297.0	204.6	154.6
27.5°	1762.4	1668.5	1618.5	1456.3	1327.5	1260.8	645.6	375.8	248.5	162.2	130.3
30°	1615.4	1547.2	1494.2	1324.5	1188.1	1124.4	559.2	312.2	206.1	133.4	103.0
32.5°	1456.3	1397.2	1315.4	1176.0	1019.9	957.7	463.7	266.7	168.2	106.1	86.4
35°	1253.3	1204.8	1127.5	986.5	836.5	809.2	394.0	213.7	131.8	84.9	72.7
37.5°	1056.3	1013.8	935.0	807.7	691.0	651.6	318.2	171.2	106.1	69.7	62.1
40°	874.4	824.4	772.9	648.6	553.1	510.7	244.0	133.4	80.3	56.1	53.0
42.5°	695.6	665.3	609.2	518.3	424.3	397.0	181.9	100.0	63.6	47.0	45.5
45°	544.0	512.2	459.2	398.6	319.8	298.5	136.4	77.3	50.0	37.9	39.4
47.5°	397.0	381.9	347.0	295.5	244.0	219.7	103.0	60.6	39.4	31.8	33.3
50°	289.4	274.3	257.6	210.6	169.7	163.7	77.3	47.0	33.3	25.8	27.3
52.5°	200.0	198.5	180.3	150.0	124.3	113.7	59.1	36.4	27.3	21.2	22.7
55°	136.4	134.9	122.7	104.6	87.9	80.3	42.4	27.3	21.2	16.7	18.2
57.5°	87.9	89.4	81.8	71.2	57.6	53.0	28.8	19.7	15.2	12.1	13.6
60°	57.6	57.6	50.0	45.5	36.4	33.3	19.7	13.6	10.6	9.1	10.6
62.5°	34.9	36.4	31.8	25.8	22.7	19.7	12.1	9.1	7.6	6.1	7.6
65°	19.7	21.2	18.2	15.2	13.6	12.1	7.6	6.1	6.1	4.5	6.1
67.5°	12.1	12.1	10.6	9.1	7.6	7.6	4.5	4.5	4.5	4.5	4.5
70°	7.6	7.6	6.1	6.1	4.5	4.5	3.0	4.5	3.0	3.0	3.0
72.5°	4.5	4.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.5	1.5
75°	3.0	3.0	3.0	3.0	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

TEST NUMBER: P601436

CATALOG NUMBER: ML4DM10LSAWW9FS1E - TIR4D25AWW - TL43R2G\_ TL44S2G\_ 5000K

**CANDELA DISTRIBUTION (continued):**

	157.5°	180°
0°	845.6	845.6
2.5°	750.1	753.2
5°	647.1	628.9
7.5°	538.0	509.2
10°	434.9	428.9
12.5°	366.7	359.2
15°	307.6	300.1
17.5°	257.6	244.0
20°	215.2	197.0
22.5°	178.8	180.3
25°	153.1	156.1
27.5°	131.8	134.9
30°	110.6	116.7
32.5°	100.0	109.1
35°	86.4	98.5
37.5°	77.3	89.4
40°	68.2	80.3
42.5°	60.6	72.7
45°	53.0	65.2
47.5°	47.0	59.1
50°	39.4	51.5
52.5°	33.3	43.9
55°	27.3	36.4
57.5°	22.7	30.3
60°	18.2	24.2
62.5°	13.6	18.2
65°	9.1	13.6
67.5°	6.1	9.1
70°	4.5	6.1
72.5°	1.5	3.0
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)