

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: P601439

Luminaire Tested: **ML4DM10LSAWW9FS1E - TIR4D25AWW - TL45R6G\_ TL46S6G\_ 3500K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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**Test Information**

Test Method: LM-79-08  
 Report Number: P601439  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Issue Date: 7/29/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: HALO  
 Catalog Number: ML4DM10LSAWW9FS1E - TIR4D25AWW - TL45R6G\_ TL46S6G\_ 3500K  
 Description: DIRECT MOUNT, 25D WW OPTIC, LINEAR SPREAD LENS TRIM  
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 3500K CCT  
 Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 887.6 lumens  
 Efficiency: N/A  
 Efficacy: 74.0 lumens/watt  
 Spacing Criteria (0/90/45): 1.21 / 0.78 / 1  
 Luminous Opening: Circular (Dia: 0.21' x H: 0')  
 CIE Type: Direct

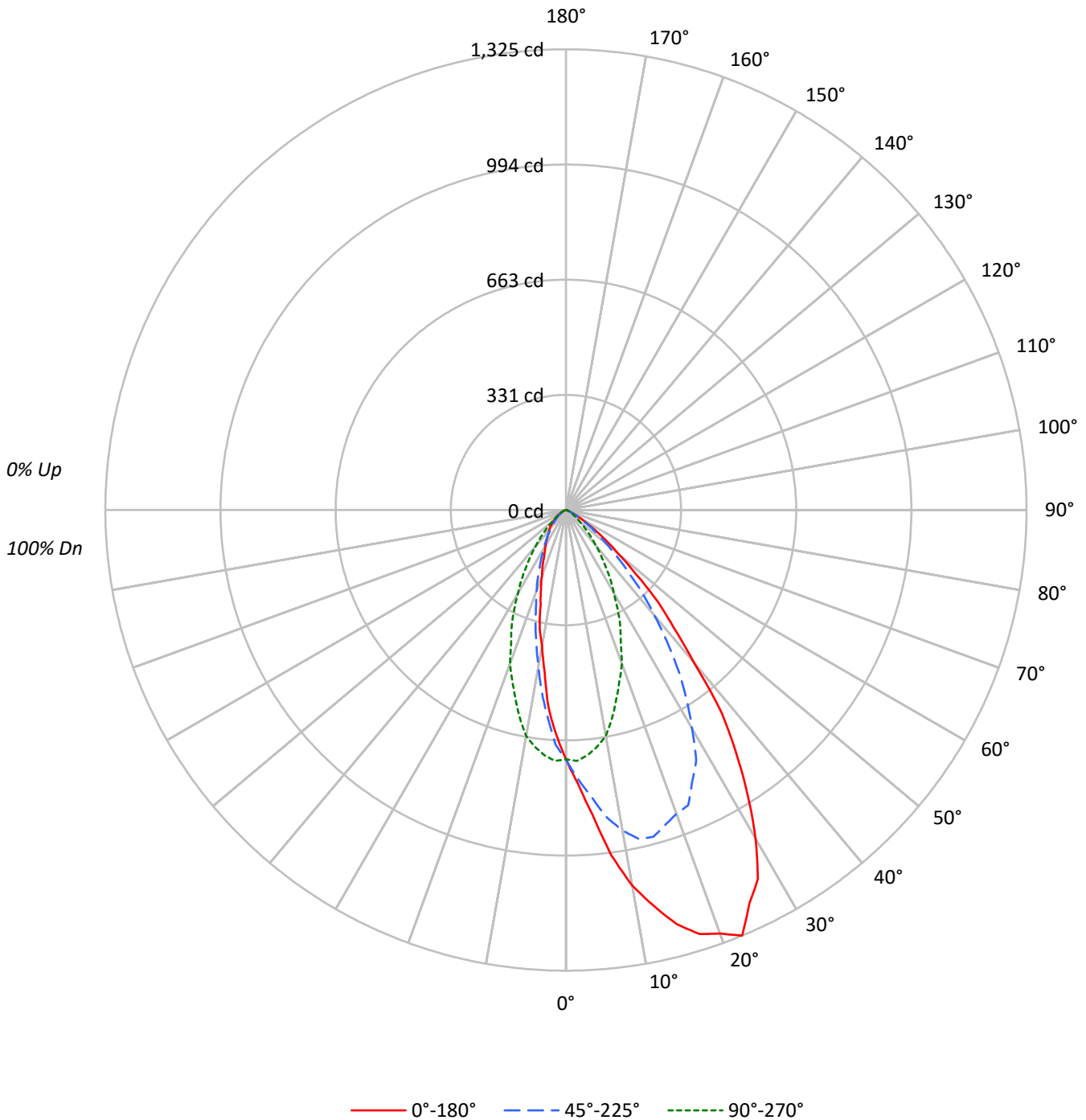
Input Watts (W): 12  
 Input Voltage (V): NR  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: NR  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 25 FT



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	104	110	107	105	103	103	101	99	100	98	96	96	95	94	92
2	106	100	96	92	104	99	95	91	95	92	89	92	90	87	90	87	85	83
3	100	92	87	82	98	91	86	81	88	84	80	86	82	79	83	80	78	76
4	94	85	79	74	92	84	78	73	82	76	72	79	75	72	78	74	71	69
5	88	78	72	67	86	77	71	67	76	70	66	74	69	65	72	68	65	63
6	83	73	66	61	81	72	65	61	70	65	60	69	64	60	67	63	59	58
7	78	68	61	56	77	67	60	56	65	60	55	64	59	55	63	58	55	53
8	74	63	56	52	72	62	56	51	61	55	51	60	55	51	59	54	51	49
9	70	59	52	48	68	58	52	48	57	52	47	56	51	47	55	51	47	46
10	66	55	49	44	65	55	48	44	54	48	44	53	48	44	52	47	44	42

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

	0°	90°	180°
0°	226372	226372	226372
5°	278808	224416	181339
10°	351417	211524	127261
15°	403269	183524	91762
20°	435562	158001	67878
25°	434779	128946	51704
30°	397648	100378	42368
35°	329430	76517	35156
40°	236563	56018	30956
45°	167683	38315	25543
50°	98347	24611	21074
55°	59071	16736	16736
60°	31640	12441	12441
65°	17334	9340	7995
70°	9879	6647	4985
75°	4392	4392	0
80°	3273	3273	0
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	67.9	7.7
10°-20°	184.8	20.8
20°-30°	241.6	27.2
30°-40°	207.2	23.3
40°-50°	118.5	13.3
50°-60°	48.5	5.5
60°-70°	15.5	1.7
70°-80°	3.3	0.4
80°-90°	0.4	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
<b>0°-30°</b>	<b>494.4</b>	<b>55.7</b>
<b>0°-40°</b>	<b>701.5</b>	<b>79.0</b>
<b>0°-60°</b>	<b>868.5</b>	<b>97.8</b>
<b>0°-90°</b>	<b>887.6</b>	<b>100.0</b>
90°-120°	0.0	0.0
90°-150°	0.0	0.0
<b>90°-180°</b>	<b>0.0</b>	<b>0.0</b>
<b>0°-180°</b>	<b>887.6</b>	<b>100.0</b>

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	717	717	717	717	717	
5°	880	826	708	599	572	91
15°	1234	973	561	338	281	348
25°	1248	860	370	177	148	571
35°	855	565	198	93	91	528
45°	376	256	86	46	57	286
55°	107	88	30	22	30	101
65°	23	20	12	9	11	25
75°	4	4	4	2	0	5
85°	0	0	0	0	0	1
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°	716.9	716.9	716.9	716.9	716.9	716.9	716.9	716.9	716.9	716.9	716.9
2.5°	786.7	802.8	797.4	806.3	804.5	788.5	772.4	747.3	722.3	708.0	675.8
5°	879.6	899.3	913.6	902.9	897.5	885.0	826.0	770.6	708.0	645.4	598.9
7.5°	1001.2	995.9	1011.9	979.8	981.5	976.2	890.4	783.1	686.5	595.4	529.2
10°	1096.0	1079.9	1096.0	1085.2	1063.8	1038.8	935.1	777.7	659.7	545.3	455.9
12.5°	1165.7	1187.2	1187.2	1162.1	1140.7	1112.1	969.0	774.2	613.2	484.5	393.3
15°	1233.6	1240.8	1228.3	1208.6	1187.2	1128.2	972.6	750.9	561.4	425.5	337.9
17.5°	1278.3	1280.1	1274.8	1256.9	1226.5	1190.7	949.4	729.5	513.1	379.0	284.3
20°	1296.2	1281.9	1280.1	1247.9	1221.1	1188.9	929.7	677.6	470.2	323.6	246.7
22.5°	1324.8	1290.9	1290.9	1258.7	1203.2	1197.9	919.0	618.6	411.2	277.1	211.0
25°	1247.9	1242.6	1253.3	1208.6	1165.7	1156.8	860.0	573.9	370.1	239.6	177.0
27.5°	1196.1	1181.8	1167.5	1138.9	1097.8	1076.3	811.7	516.7	321.8	200.2	150.2
30°	1090.6	1090.6	1072.7	1058.4	1003.0	986.9	725.9	463.1	275.3	171.6	125.2
32.5°	974.4	958.3	960.1	944.0	910.0	897.5	645.4	404.1	237.8	139.5	109.1
35°	854.6	836.7	827.8	815.3	809.9	770.6	565.0	348.6	198.5	121.6	93.0
37.5°	736.6	718.7	711.6	691.9	663.3	654.4	477.4	289.6	166.3	100.1	76.9
40°	573.9	573.9	572.1	550.7	541.7	536.4	395.1	241.4	135.9	80.5	66.2
42.5°	457.7	463.1	459.5	450.5	430.9	427.3	329.0	196.7	110.8	67.9	55.4
45°	375.5	359.4	355.8	354.0	343.3	341.5	255.7	155.5	85.8	55.4	46.5
47.5°	275.3	273.5	277.1	268.2	255.7	266.4	202.0	118.0	67.9	44.7	39.3
50°	200.2	203.8	203.8	194.9	191.3	194.9	155.5	89.4	50.1	35.8	34.0
52.5°	150.2	148.4	146.6	148.4	146.6	146.6	116.2	66.2	39.3	28.6	26.8
55°	107.3	107.3	105.5	109.1	110.8	107.3	87.6	48.3	30.4	23.2	21.5
57.5°	75.1	75.1	71.5	75.1	75.1	78.7	62.6	35.8	25.0	17.9	17.9
60°	50.1	50.1	50.1	51.8	53.6	53.6	42.9	25.0	19.7	14.3	14.3
62.5°	34.0	34.0	34.0	35.8	35.8	39.3	30.4	19.7	16.1	12.5	10.7
65°	23.2	23.2	23.2	23.2	25.0	25.0	19.7	14.3	12.5	10.7	8.9
67.5°	14.3	16.1	14.3	16.1	16.1	16.1	12.5	10.7	8.9	7.2	5.4
70°	10.7	10.7	10.7	10.7	10.7	10.7	8.9	8.9	7.2	5.4	3.6
72.5°	7.2	7.2	7.2	7.2	7.2	7.2	5.4	5.4	5.4	3.6	3.6
75°	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	1.8	1.8
77.5°	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0
80°	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0	0.0
82.5°	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	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°	716.9	716.9
2.5°	657.9	645.4
5°	557.8	572.1
7.5°	486.3	468.4
10°	407.6	396.9
12.5°	354.0	348.6
15°	293.2	280.7
17.5°	252.1	239.6
20°	211.0	202.0
22.5°	180.6	175.2
25°	155.5	148.4
27.5°	134.1	130.5
30°	116.2	116.2
32.5°	100.1	103.7
35°	89.4	91.2
37.5°	76.9	80.5
40°	71.5	75.1
42.5°	60.8	67.9
45°	51.8	57.2
47.5°	44.7	50.1
50°	37.5	42.9
52.5°	34.0	37.5
55°	28.6	30.4
57.5°	23.2	25.0
60°	17.9	19.7
62.5°	14.3	16.1
65°	10.7	10.7
67.5°	7.2	8.9
70°	3.6	5.4
72.5°	1.8	1.8
75°	1.8	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)