

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: P601239

Luminaire Tested: **ML408LSAWW95FS1E - TIR4D25AWW - TL45R6G\_ TL46S6G\_ 2700K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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**Test Information**

Test Method: LM-79-08  
 Report Number: P601239  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Issue Date: 7/29/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: HALO  
 Catalog Number: ML408LSAWW95FS1E - TIR4D25AWW - TL45R6G\_ TL46S6G\_ 2700K  
 Description: RETROFIT, 25D WW OPTIC, LINEAR SPREAD LENS TRIM  
 Light Source: (1) SELECTABLE LUMEN LED 95CRI / 2700K CCT  
 Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 727.0 lumens  
 Efficiency: N/A  
 Efficacy: 70.6 lumens/watt  
 Spacing Criteria (0/90/45): 1.21 / 0.78 / 1  
 Luminous Opening: Circular (Dia: 0.21' x H: 0')  
 CIE Type: Direct

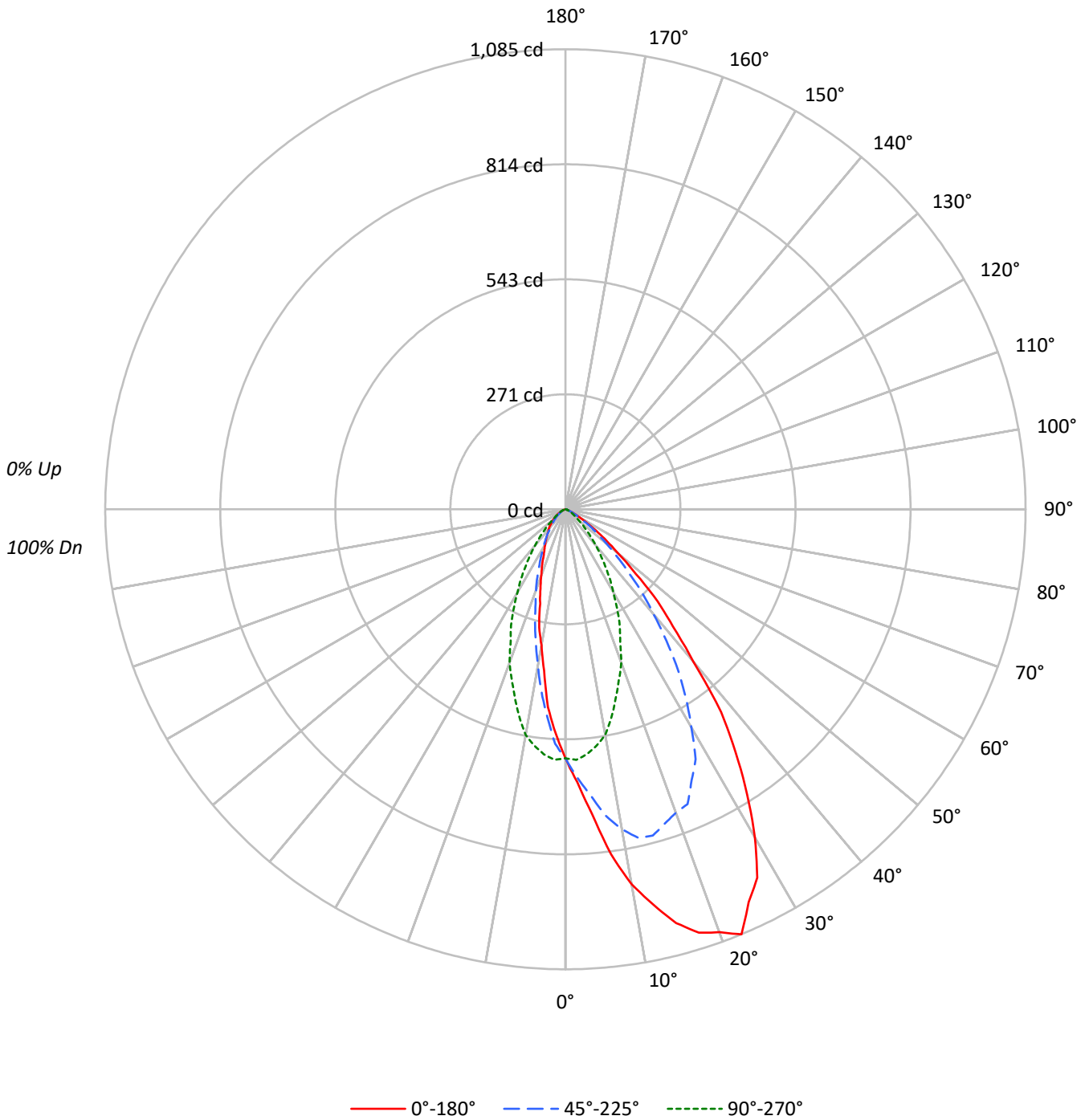
Input Watts (W): 10.3  
 Input Voltage (V): NR  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: NR  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 25 FT



Meas		Calibration Due Date	
Instrument	Identificatio		
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°	185417	185417	185417
5°	228346	183812	148533
10°	287803	173240	104239
15°	330271	150311	75155
20°	356730	129405	55613
25°	356108	105603	42332
30°	325673	82221	34711
35°	269796	62640	28795
40°	193735	45878	25350
45°	137317	31393	20944
50°	80564	20141	17243
55°	48391	13708	13708
60°	25893	10168	10168
65°	14196	7621	6575
70°	8124	5447	4062
75°	3538	3538	0
80°	2728	2728	0
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	55.6	7.7
10°-20°	151.4	20.8
20°-30°	197.9	27.2
30°-40°	169.7	23.3
40°-50°	97.1	13.4
50°-60°	39.7	5.5
60°-70°	12.7	1.7
70°-80°	2.7	0.4
80°-90°	0.3	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>404.9</b>	<b>55.7</b>
<b>0°-40°</b>	<b>574.6</b>	<b>79.0</b>
<b>0°-60°</b>	<b>711.3</b>	<b>97.8</b>
<b>0°-90°</b>	<b>727.0</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>727.0</b>	<b>100.0</b>

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	587	587	587	587	587	
5°	720	676	580	490	469	75
15°	1010	797	460	277	230	285
25°	1022	704	303	145	122	468
35°	700	463	162	76	75	432
45°	308	209	70	38	47	234
55°	88	72	25	18	25	83
65°	19	16	10	7	9	20
75°	3	3	3	2	0	4
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°	587.2	587.2	587.2	587.2	587.2	587.2	587.2	587.2	587.2	587.2	587.2
2.5°	644.3	657.5	653.1	660.4	658.9	645.7	632.6	612.1	591.6	579.9	553.5
5°	720.4	736.5	748.2	739.5	735.1	724.8	676.5	631.1	579.9	528.6	490.5
7.5°	820.0	815.6	828.8	802.4	803.9	799.5	729.2	641.4	562.3	487.6	433.4
10°	897.6	884.4	897.6	888.8	871.2	850.7	765.8	637.0	540.3	446.6	373.4
12.5°	954.7	972.3	972.3	951.8	934.2	910.8	793.6	634.0	502.2	396.8	322.1
15°	1010.3	1016.2	1006.0	989.8	972.3	924.0	796.6	615.0	459.8	348.5	276.7
17.5°	1047.0	1048.4	1044.0	1029.4	1004.5	975.2	777.5	597.4	420.2	310.4	232.8
20°	1061.6	1049.9	1048.4	1022.1	1000.1	973.7	761.4	555.0	385.1	265.0	202.1
22.5°	1085.0	1057.2	1057.2	1030.8	985.5	981.1	752.6	506.6	336.8	227.0	172.8
25°	1022.1	1017.7	1026.5	989.8	954.7	947.4	704.3	470.0	303.1	196.2	145.0
27.5°	979.6	967.9	956.2	932.7	899.1	881.5	664.8	423.2	263.6	164.0	123.0
30°	893.2	893.2	878.6	866.8	821.5	808.3	594.5	379.2	225.5	140.6	102.5
32.5°	798.0	784.9	786.3	773.1	745.3	735.1	528.6	330.9	194.7	114.2	89.3
35°	699.9	685.3	678.0	667.7	663.3	631.1	462.7	285.5	162.5	99.6	76.1
37.5°	603.3	588.6	582.8	566.7	543.2	535.9	391.0	237.2	136.2	82.0	63.0
40°	470.0	470.0	468.6	451.0	443.7	439.3	323.6	197.7	111.3	65.9	54.2
42.5°	374.9	379.2	376.3	369.0	352.9	350.0	269.4	161.1	90.8	55.6	45.4
45°	307.5	294.3	291.4	289.9	281.1	279.7	209.4	127.4	70.3	45.4	38.1
47.5°	225.5	224.0	227.0	219.6	209.4	218.2	165.5	96.6	55.6	36.6	32.2
50°	164.0	166.9	166.9	159.6	156.7	159.6	127.4	73.2	41.0	29.3	27.8
52.5°	123.0	121.5	120.1	121.5	120.1	120.1	95.2	54.2	32.2	23.4	22.0
55°	87.9	87.9	86.4	89.3	90.8	87.9	71.7	39.5	24.9	19.0	17.6
57.5°	61.5	61.5	58.6	61.5	61.5	64.4	51.2	29.3	20.5	14.6	14.6
60°	41.0	41.0	41.0	42.5	43.9	43.9	35.1	20.5	16.1	11.7	11.7
62.5°	27.8	27.8	27.8	29.3	29.3	32.2	24.9	16.1	13.2	10.2	8.8
65°	19.0	19.0	19.0	19.0	20.5	20.5	16.1	11.7	10.2	8.8	7.3
67.5°	11.7	13.2	11.7	13.2	13.2	13.2	10.2	8.8	7.3	5.9	4.4
70°	8.8	8.8	8.8	8.8	8.8	8.8	7.3	7.3	5.9	4.4	2.9
72.5°	5.9	5.9	5.9	5.9	5.9	5.9	4.4	4.4	4.4	2.9	2.9
75°	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	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°	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	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°	587.2	587.2
2.5°	538.9	528.6
5°	456.9	468.6
7.5°	398.3	383.6
10°	333.9	325.1
12.5°	289.9	285.5
15°	240.1	229.9
17.5°	206.5	196.2
20°	172.8	165.5
22.5°	147.9	143.5
25°	127.4	121.5
27.5°	109.8	106.9
30°	95.2	95.2
32.5°	82.0	84.9
35°	73.2	74.7
37.5°	63.0	65.9
40°	58.6	61.5
42.5°	49.8	55.6
45°	42.5	46.9
47.5°	36.6	41.0
50°	30.7	35.1
52.5°	27.8	30.7
55°	23.4	24.9
57.5°	19.0	20.5
60°	14.6	16.1
62.5°	11.7	13.2
65°	8.8	8.8
67.5°	5.9	7.3
70°	2.9	4.4
72.5°	1.5	1.5
75°	1.5	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)