

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: P601284

Luminaire Tested: **ML410LSAWW9FS1E - 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: P601284
 Test Lab: COOPER LIGHTING SOLUTIONS
 Issue Date: 7/29/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: HALO
 Catalog Number: ML410LSAWW9FS1E - TIR4D25AWW - TL45R6G_ TL46S6G_ 2700K
 Description: RETROFIT, 25D WW OPTIC, LINEAR SPREAD LENS TRIM
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 2700K CCT
 Ballast/Driver: -

Summary

Lumens per Lamp: N/A
 Luminaire Lumens: 836.3 lumens
 Efficiency: N/A
 Efficacy: 69.7 lumens/watt
 Spacing Criteria (0/90/45): 1.21 / 0.78 / 1
 Luminous Opening: Circular (Dia: 0.21' x H: 0')
 CIE Type: Direct

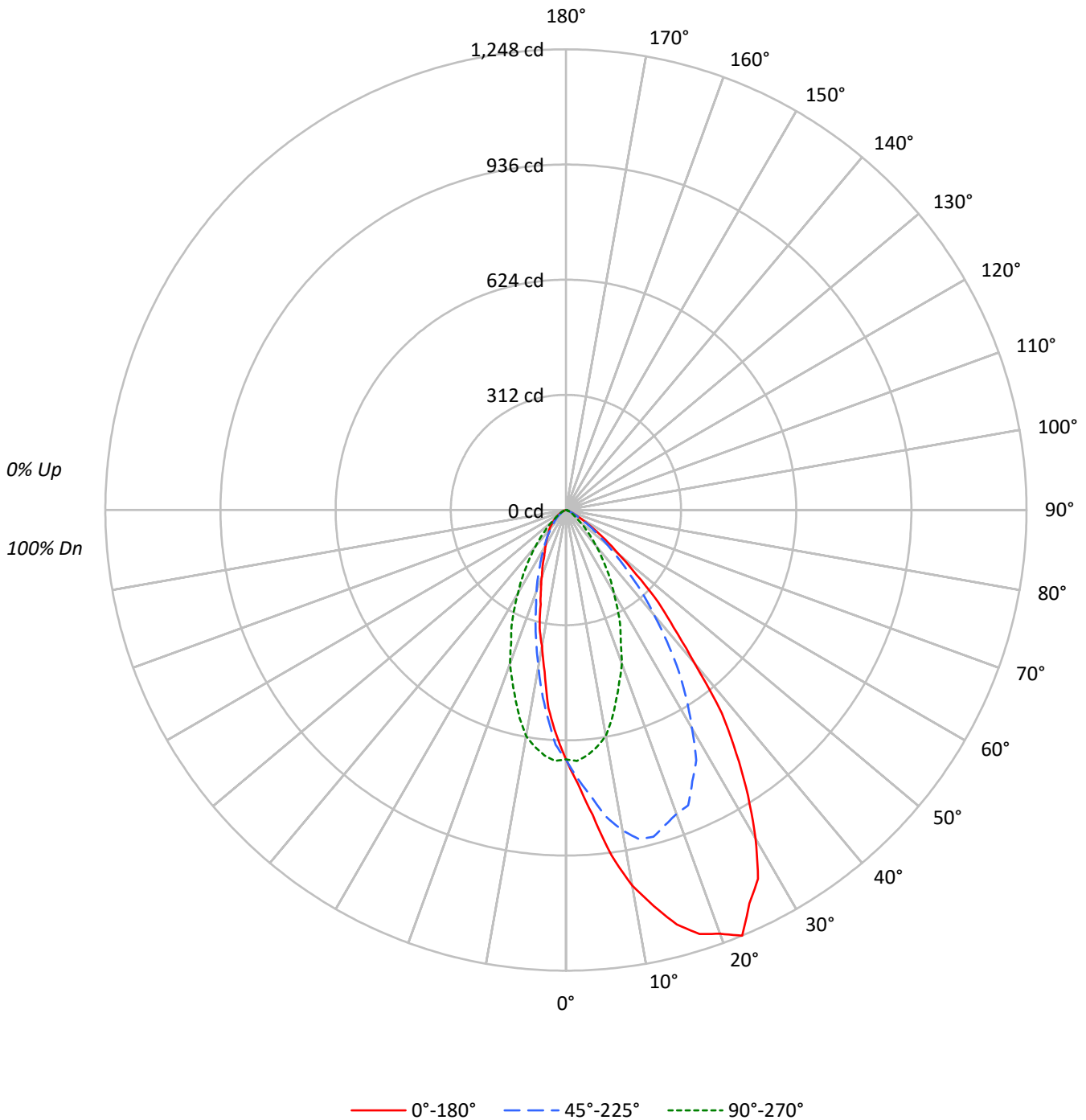
Input Watts (W): 12
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



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	50	30	10
RCR																				
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100	100	100
1	113	110	107	104	110	107	105	103	103	101	99	100	98	96	96	95	94	92	92	92
2	106	100	96	92	104	99	95	91	95	92	89	92	90	87	90	87	85	83	83	83
3	100	92	87	82	98	91	86	81	88	84	80	86	82	79	83	80	78	76	76	76
4	94	85	79	74	92	84	78	73	82	76	72	79	75	72	78	74	71	69	69	69
5	88	78	72	67	86	77	71	67	76	70	66	74	69	65	72	68	65	63	63	63
6	83	73	66	61	81	72	65	61	70	65	60	69	64	60	67	63	59	58	58	58
7	78	68	61	56	77	67	60	56	65	60	55	64	59	55	63	58	55	53	53	53
8	74	63	56	52	72	62	56	51	61	55	51	60	55	51	59	54	51	49	49	49
9	70	59	52	48	68	58	52	48	57	52	47	56	51	47	55	51	47	46	46	46
10	66	55	49	44	65	55	48	44	54	48	44	53	48	44	52	47	44	42	42	42

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	213299	213299	213299
5°	262706	211420	170848
10°	331089	199308	119886
15°	379961	172900	86466
20°	410360	148861	63947
25°	409624	121490	48707
30°	374641	94581	39925
35°	310387	72084	33113
40°	222878	52762	29143
45°	157948	36127	24070
50°	92698	23187	19846
55°	55658	15745	15745
60°	29808	11683	11683
65°	16363	8817	7546
70°	9325	6186	4709
75°	4148	4148	0
80°	3091	3091	0
85°	0	0	0

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	64.0	7.7
10°-20°	174.2	20.8
20°-30°	227.6	27.2
30°-40°	195.2	23.3
40°-50°	111.6	13.4
50°-60°	45.6	5.5
60°-70°	14.6	1.7
70°-80°	3.1	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
0°-30°	465.8	55.7
0°-40°	661.0	79.0
0°-60°	818.2	97.8
0°-90°	836.3	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	836.3	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	676	676	676	676	676	
5°	829	778	667	564	539	86
15°	1162	916	529	318	264	328
25°	1176	810	349	167	140	538
35°	805	532	187	88	86	497
45°	354	241	81	44	54	269
55°	101	82	29	20	29	96
65°	22	18	12	8	10	24
75°	3	3	3	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°	675.5	675.5	675.5	675.5	675.5	675.5	675.5	675.5	675.5	675.5	675.5
2.5°	741.2	756.3	751.3	759.7	758.0	742.8	727.7	704.1	680.5	667.0	636.7
5°	828.8	847.3	860.8	850.6	845.6	833.8	778.2	726.0	667.0	608.1	564.3
7.5°	943.3	938.2	953.4	923.1	924.8	919.7	838.9	737.8	646.8	560.9	498.6
10°	1032.6	1017.4	1032.6	1022.5	1002.2	978.7	881.0	732.7	621.6	513.8	429.5
12.5°	1098.3	1118.5	1118.5	1094.9	1074.7	1047.7	913.0	729.4	577.8	456.5	370.6
15°	1162.3	1169.0	1157.2	1138.7	1118.5	1062.9	916.3	707.5	528.9	400.9	318.4
17.5°	1204.4	1206.1	1201.0	1184.2	1155.5	1121.8	894.4	687.3	483.4	357.1	267.8
20°	1221.2	1207.8	1206.1	1175.7	1150.5	1120.2	875.9	638.4	443.0	304.9	232.5
22.5°	1248.2	1216.2	1216.2	1185.9	1133.6	1128.6	865.8	582.8	387.4	261.1	198.8
25°	1175.7	1170.7	1180.8	1138.7	1098.3	1089.8	810.2	540.7	348.7	225.7	166.8
27.5°	1126.9	1113.4	1099.9	1073.0	1034.3	1014.0	764.7	486.8	303.2	188.7	141.5
30°	1027.5	1027.5	1010.7	997.2	945.0	929.8	683.9	436.3	259.4	161.7	117.9
32.5°	918.0	902.9	904.6	889.4	857.4	845.6	608.1	380.7	224.0	131.4	102.8
35°	805.2	788.3	779.9	768.1	763.1	726.0	532.3	328.5	187.0	114.5	87.6
37.5°	694.0	677.2	670.4	651.9	624.9	616.5	449.7	272.9	156.7	94.3	72.4
40°	540.7	540.7	539.0	518.8	510.4	505.3	372.3	227.4	128.0	75.8	62.3
42.5°	431.2	436.3	432.9	424.5	406.0	402.6	309.9	185.3	104.4	64.0	52.2
45°	353.7	338.6	335.2	333.5	323.4	321.7	240.9	146.5	80.9	52.2	43.8
47.5°	259.4	257.7	261.1	252.7	240.9	251.0	190.3	111.2	64.0	42.1	37.1
50°	188.7	192.0	192.0	183.6	180.2	183.6	146.5	84.2	47.2	33.7	32.0
52.5°	141.5	139.8	138.1	139.8	138.1	138.1	109.5	62.3	37.1	27.0	25.3
55°	101.1	101.1	99.4	102.8	104.4	101.1	82.5	45.5	28.6	21.9	20.2
57.5°	70.7	70.7	67.4	70.7	70.7	74.1	59.0	33.7	23.6	16.8	16.8
60°	47.2	47.2	47.2	48.8	50.5	50.5	40.4	23.6	18.5	13.5	13.5
62.5°	32.0	32.0	32.0	33.7	33.7	37.1	28.6	18.5	15.2	11.8	10.1
65°	21.9	21.9	21.9	21.9	23.6	23.6	18.5	13.5	11.8	10.1	8.4
67.5°	13.5	15.2	13.5	15.2	15.2	15.2	11.8	10.1	8.4	6.7	5.1
70°	10.1	10.1	10.1	10.1	10.1	10.1	8.4	8.4	6.7	5.1	3.4
72.5°	6.7	6.7	6.7	6.7	6.7	6.7	5.1	5.1	5.1	3.4	3.4
75°	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	1.7	1.7
77.5°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.0
80°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.0	0.0
82.5°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	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°	675.5	675.5
2.5°	619.9	608.1
5°	525.5	539.0
7.5°	458.2	441.3
10°	384.1	373.9
12.5°	333.5	328.5
15°	276.3	264.5
17.5°	237.5	225.7
20°	198.8	190.3
22.5°	170.1	165.1
25°	146.5	139.8
27.5°	126.3	123.0
30°	109.5	109.5
32.5°	94.3	97.7
35°	84.2	85.9
37.5°	72.4	75.8
40°	67.4	70.7
42.5°	57.3	64.0
45°	48.8	53.9
47.5°	42.1	47.2
50°	35.4	40.4
52.5°	32.0	35.4
55°	27.0	28.6
57.5°	21.9	23.6
60°	16.8	18.5
62.5°	13.5	15.2
65°	10.1	10.1
67.5°	6.7	8.4
70°	3.4	5.1
72.5°	1.7	1.7
75°	1.7	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)