

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: P601286

Luminaire Tested: **ML410LSAWW9FS1E - 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: P601286
 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_ 3500K
 Description: RETROFIT, 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

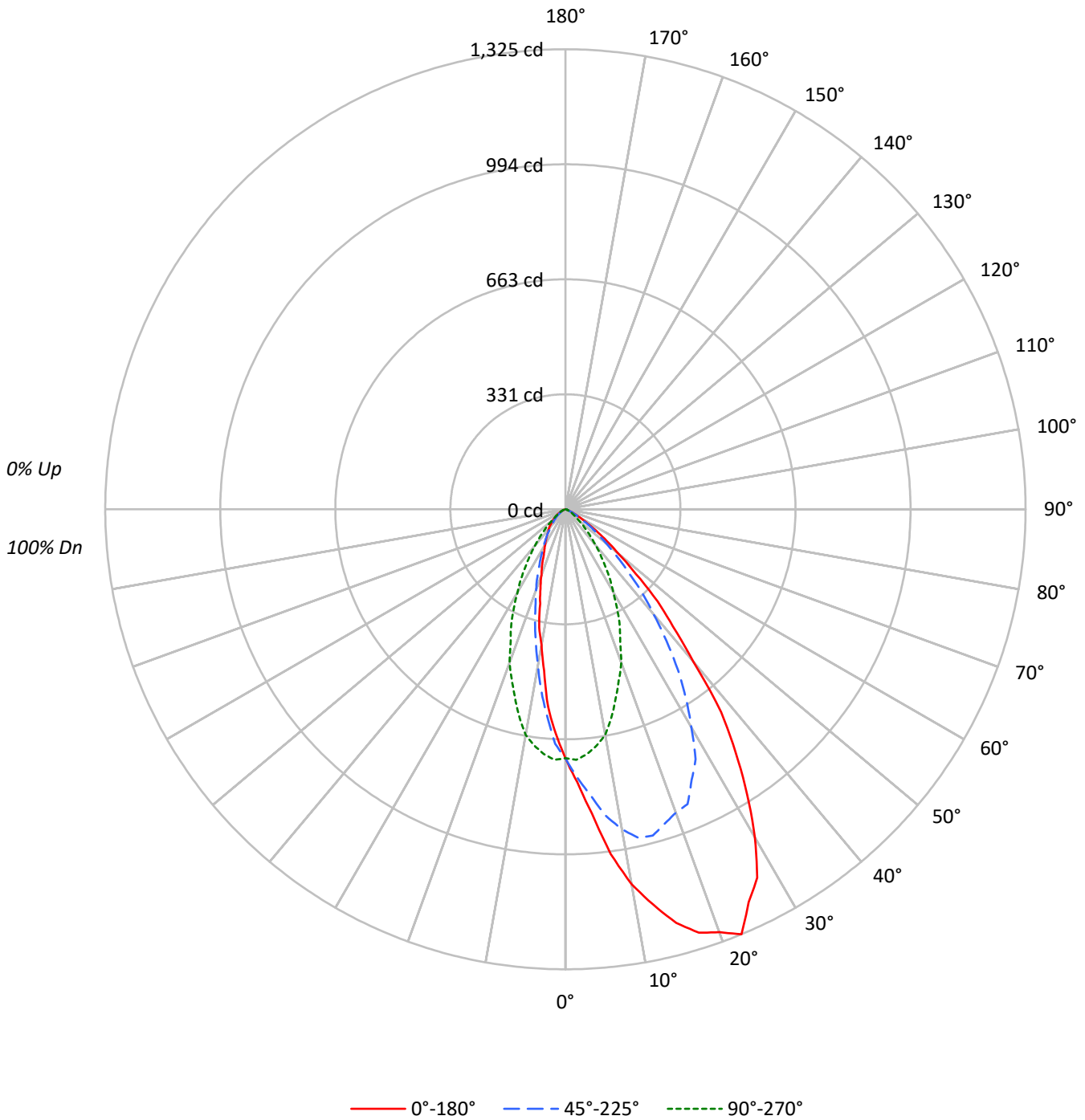
Input Watts (W): 12
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



Meas		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	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	100	100	96	96	96	92	92	92	88	88	88	84	84	84	
1	113	110	107	104	110	107	105	103	103	101	99	100	98	96	96	95	94	92	92	91	89	87	85	83	83	82	80	78	76	76	74	74	
2	106	100	96	92	104	99	95	91	95	92	89	92	90	87	90	87	85	83	83	82	80	78	76	76	74	74	72	72	70	68	66	63	
3	100	92	87	82	98	91	86	81	88	84	80	86	82	79	83	80	78	76	76	74	72	70	68	66	63	63	62	60	58	56	53	53	
4	94	85	79	74	92	84	78	73	82	76	72	79	75	72	78	74	71	69	74	69	65	63	61	58	56	53	53	51	49	47	46	46	
5	88	78	72	67	86	77	71	67	76	70	66	74	69	65	72	68	65	63	63	62	60	58	56	53	53	51	49	47	46	46	46	46	
6	83	73	66	61	81	72	65	61	70	65	60	69	64	60	67	63	59	58	67	63	59	58	56	53	53	51	49	47	46	46	46	46	
7	78	68	61	56	77	67	60	56	65	60	55	64	59	55	63	58	55	53	63	58	55	53	53	51	49	47	46	46	46	46	46	46	
8	74	63	56	52	72	62	56	51	61	55	51	60	55	51	59	54	51	49	59	54	51	49	47	46	46	46	46	46	46	46	46	46	46
9	70	59	52	48	68	58	52	48	57	52	47	56	51	47	55	51	47	46	55	51	47	46	46	46	46	46	46	46	46	46	46	46	46
10	66	55	49	44	65	55	48	44	54	48	44	53	48	44	52	47	44	42	52	47	44	42	42	42	42	42	42	42	42	42	42	42	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
0°-30°	494.4	55.7
0°-40°	701.5	79.0
0°-60°	868.5	97.8
0°-90°	887.6	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	887.6	100.0

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)