

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: P601287

Luminaire Tested: **ML410LSAWW9FS1E - TIR4D25AWW - TL45R6G_ TL46S6G_ 4000K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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Test Information

Test Method: LM-79-08
 Report Number: P601287
 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_ 4000K
 Description: RETROFIT, 25D WW OPTIC, LINEAR SPREAD LENS TRIM
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 4000K CCT
 Ballast/Driver: -

Summary

Lumens per Lamp: N/A
 Luminaire Lumens: 883.4 lumens
 Efficiency: N/A
 Efficacy: 73.6 lumens/watt
 Spacing Criteria (0/90/45): 1.21 / 0.78 / 1
 Luminous Opening: Circular (Dia: 0.21' x H: 0')
 CIE Type: Direct

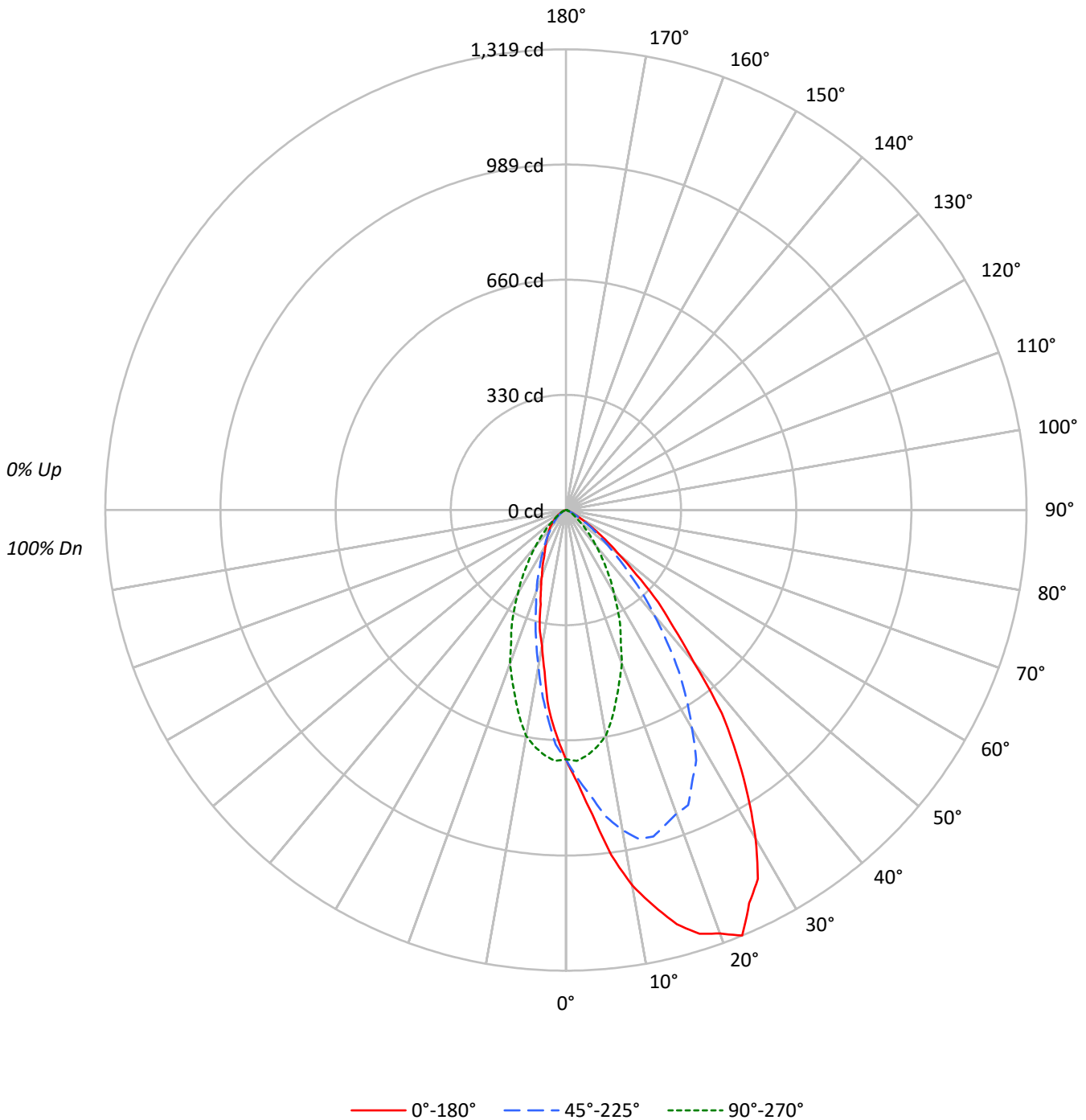
Input Watts (W): 12
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



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	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°	225330	225330	225330
5°	277508	223370	180483
10°	349750	210530	126651
15°	401373	182641	91337
20°	433513	157262	67576
25°	432758	128319	51460
30°	395789	99904	42186
35°	327888	76132	35001
40°	235450	55730	30792
45°	166879	38136	25409
50°	97905	24464	20976
55°	58796	16681	16681
60°	31450	12378	12378
65°	17259	9340	7995
70°	9879	6555	4893
75°	4392	4392	0
80°	3273	3273	0
85°	0	0	0

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	67.6	7.7
10°-20°	184.0	20.8
20°-30°	240.5	27.2
30°-40°	206.2	23.3
40°-50°	117.9	13.4
50°-60°	48.2	5.5
60°-70°	15.4	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°	492.0	55.7
0°-40°	698.2	79.0
0°-60°	864.4	97.8
0°-90°	883.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	883.4	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	714	714	714	714	714	
5°	876	822	705	596	569	91
15°	1228	968	559	336	279	347
25°	1242	856	368	176	148	568
35°	851	562	198	92	91	525
45°	374	254	85	46	57	284
55°	107	87	30	21	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°	713.6	713.6	713.6	713.6	713.6	713.6	713.6	713.6	713.6	713.6	713.6
2.5°	783.0	799.0	793.6	802.5	800.7	784.7	768.7	743.8	718.9	704.7	672.6
5°	875.5	895.1	909.3	898.6	893.3	880.8	822.1	766.9	704.7	642.4	596.1
7.5°	996.5	991.1	1007.2	975.1	976.9	971.6	886.2	779.4	683.3	592.6	526.7
10°	1090.8	1074.8	1090.8	1080.1	1058.8	1033.9	930.6	774.1	656.6	542.7	453.8
12.5°	1160.2	1181.5	1181.5	1156.6	1135.3	1106.8	964.5	770.5	610.3	482.2	391.5
15°	1227.8	1234.9	1222.5	1202.9	1181.5	1122.8	968.0	747.4	558.7	423.5	336.3
17.5°	1272.3	1274.1	1268.7	1250.9	1220.7	1185.1	944.9	726.0	510.7	377.2	282.9
20°	1290.1	1275.9	1274.1	1242.1	1215.4	1183.3	925.3	674.4	468.0	322.1	245.6
22.5°	1318.6	1284.8	1284.8	1252.7	1197.6	1192.2	914.6	615.7	409.3	275.8	210.0
25°	1242.1	1236.7	1247.4	1202.9	1160.2	1151.3	855.9	571.2	368.3	238.4	176.2
27.5°	1190.4	1176.2	1162.0	1133.5	1092.6	1071.2	807.9	514.3	320.3	199.3	149.5
30°	1085.5	1085.5	1067.7	1053.4	998.3	982.3	722.5	460.9	274.0	170.8	124.6
32.5°	969.8	953.8	955.6	939.5	905.7	893.3	642.4	402.2	236.7	138.8	108.5
35°	850.6	832.8	823.9	811.4	806.1	766.9	562.3	347.0	197.5	121.0	92.5
37.5°	733.1	715.3	708.2	688.6	660.2	651.3	475.1	288.3	165.5	99.6	76.5
40°	571.2	571.2	569.4	548.1	539.2	533.8	393.3	240.2	135.2	80.1	65.8
42.5°	455.5	460.9	457.3	448.4	428.8	425.3	327.4	195.7	110.3	67.6	55.2
45°	373.7	357.7	354.1	352.3	341.7	339.9	254.5	154.8	85.4	55.2	46.3
47.5°	274.0	272.3	275.8	266.9	254.5	265.1	201.1	117.4	67.6	44.5	39.1
50°	199.3	202.9	202.9	194.0	190.4	194.0	154.8	89.0	49.8	35.6	33.8
52.5°	149.5	147.7	145.9	147.7	145.9	145.9	115.7	65.8	39.1	28.5	26.7
55°	106.8	106.8	105.0	108.5	110.3	106.8	87.2	48.0	30.3	23.1	21.4
57.5°	74.7	74.7	71.2	74.7	74.7	78.3	62.3	35.6	24.9	17.8	17.8
60°	49.8	49.8	49.8	51.6	53.4	53.4	42.7	24.9	19.6	14.2	14.2
62.5°	33.8	33.8	33.8	35.6	35.6	39.1	30.3	19.6	16.0	12.5	10.7
65°	23.1	23.1	23.1	23.1	24.9	24.9	19.6	14.2	12.5	10.7	8.9
67.5°	14.2	16.0	14.2	16.0	16.0	16.0	12.5	10.7	8.9	7.1	5.3
70°	10.7	10.7	10.7	10.7	10.7	10.7	8.9	8.9	7.1	5.3	3.6
72.5°	7.1	7.1	7.1	7.1	7.1	7.1	5.3	5.3	5.3	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°	713.6	713.6
2.5°	654.8	642.4
5°	555.2	569.4
7.5°	484.0	466.2
10°	405.7	395.0
12.5°	352.3	347.0
15°	291.8	279.4
17.5°	250.9	238.4
20°	210.0	201.1
22.5°	179.7	174.4
25°	154.8	147.7
27.5°	133.5	129.9
30°	115.7	115.7
32.5°	99.6	103.2
35°	89.0	90.8
37.5°	76.5	80.1
40°	71.2	74.7
42.5°	60.5	67.6
45°	51.6	56.9
47.5°	44.5	49.8
50°	37.4	42.7
52.5°	33.8	37.4
55°	28.5	30.3
57.5°	23.1	24.9
60°	17.8	19.6
62.5°	14.2	16.0
65°	10.7	10.7
67.5°	7.1	8.9
70°	3.6	5.3
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)