

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: P601178

Luminaire Tested: **ML406AWW9FS1E - 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: P601178
 Test Lab: COOPER LIGHTING SOLUTIONS
 Issue Date: 7/29/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: HALO
 Catalog Number: ML406AWW9FS1E - 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: 647.4 lumens
 Efficiency: N/A
 Efficacy: 78.0 lumens/watt
 Spacing Criteria (0/90/45): 1.21 / 0.78 / 1
 Luminous Opening: Circular (Dia: 0.21' x H: 0')
 CIE Type: Direct

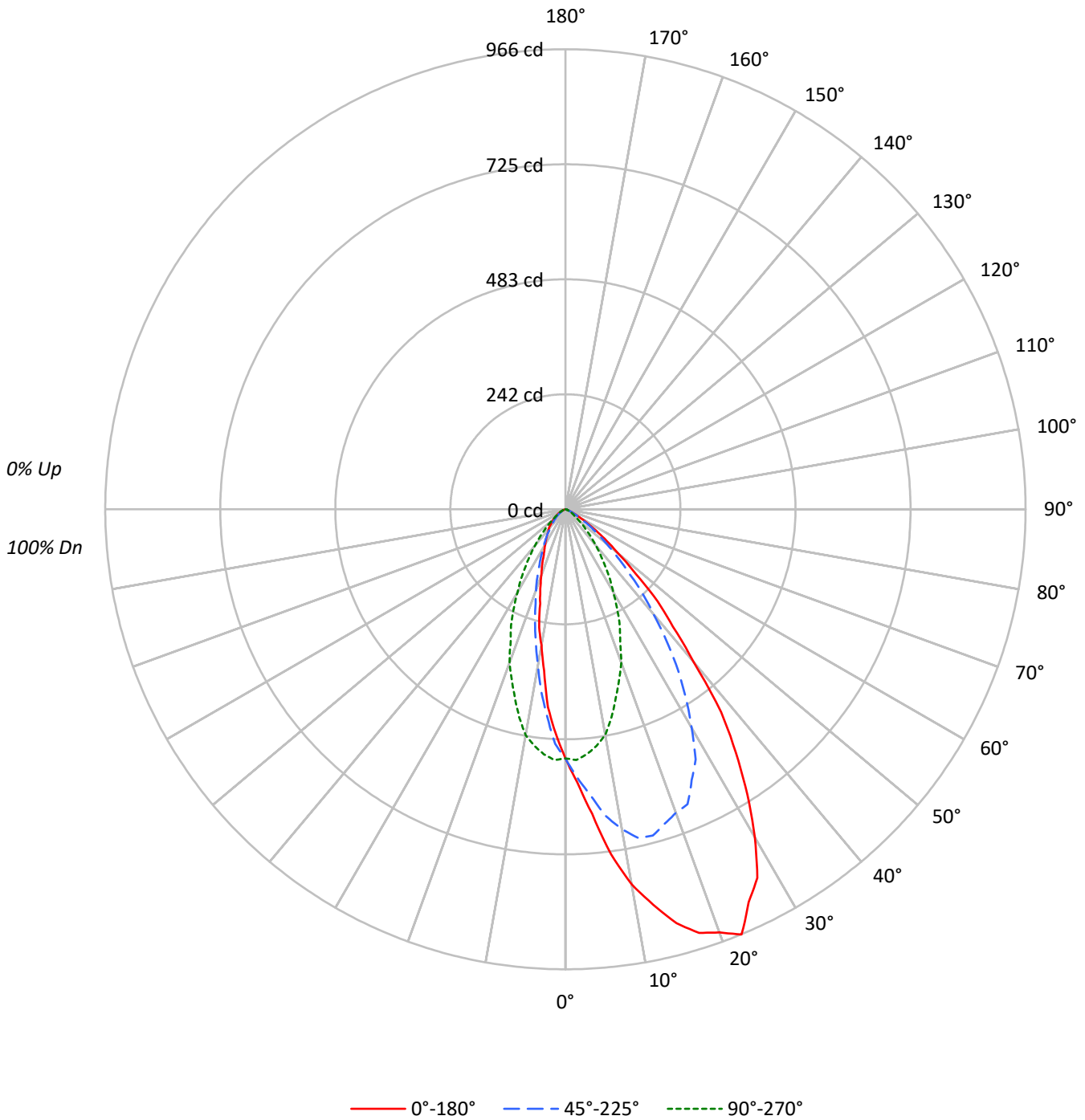
Input Watts (W): 8.3
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



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	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°	165145	165145	165145
5°	203369	163684	132272
10°	256317	154290	92824
15°	294181	133867	66950
20°	317717	115258	49531
25°	317156	94070	37698
30°	290051	73215	30919
35°	240307	55817	25634
40°	172548	40849	22589
45°	122313	27955	18622
50°	71771	17930	15376
55°	43051	12222	12222
60°	23051	9031	9031
65°	12702	6799	5828
70°	7201	4801	3601
75°	3172	3172	0
80°	2364	2364	0
85°	0	0	0

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	49.5	7.7
10°-20°	134.8	20.8
20°-30°	176.2	27.2
30°-40°	151.1	23.3
40°-50°	86.4	13.4
50°-60°	35.3	5.5
60°-70°	11.3	1.7
70°-80°	2.4	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°	360.6	55.7
0°-40°	511.7	79.0
0°-60°	633.5	97.8
0°-90°	647.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	647.4	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	523	523	523	523	523	
5°	642	602	516	437	417	67
15°	900	710	410	246	205	254
25°	910	627	270	129	108	417
35°	623	412	145	68	66	385
45°	274	186	63	34	42	208
55°	78	64	22	16	22	74
65°	17	14	9	6	8	18
75°	3	3	3	1	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°	523.0	523.0	523.0	523.0	523.0	523.0	523.0	523.0	523.0	523.0	523.0
2.5°	573.8	585.6	581.6	588.2	586.9	575.1	563.4	545.1	526.9	516.4	493.0
5°	641.6	656.0	666.4	658.6	654.7	645.6	602.5	562.1	516.4	470.8	436.9
7.5°	730.3	726.4	738.1	714.7	716.0	712.1	649.5	571.2	500.8	434.3	386.0
10°	799.4	787.7	799.4	791.6	776.0	757.7	682.1	567.3	481.2	397.8	332.6
12.5°	850.3	866.0	866.0	847.7	832.0	811.2	706.8	564.7	447.3	353.4	286.9
15°	899.9	905.1	895.9	881.6	866.0	822.9	709.5	547.7	409.5	310.4	246.5
17.5°	932.5	933.8	929.9	916.8	894.6	868.6	692.5	532.1	374.3	276.5	207.4
20°	945.5	935.1	933.8	910.3	890.7	867.3	678.2	494.3	343.0	236.0	180.0
22.5°	966.4	941.6	941.6	918.1	877.7	873.8	670.3	451.2	300.0	202.1	153.9
25°	910.3	906.4	914.2	881.6	850.3	843.8	627.3	418.6	270.0	174.8	129.1
27.5°	872.5	862.0	851.6	830.7	800.7	785.1	592.1	376.9	234.7	146.1	109.5
30°	795.5	795.5	782.5	772.1	731.6	719.9	529.5	337.8	200.8	125.2	91.3
32.5°	710.8	699.0	700.3	688.6	663.8	654.7	470.8	294.7	173.5	101.7	79.6
35°	623.4	610.3	603.8	594.7	590.8	562.1	412.1	254.3	144.8	88.7	67.8
37.5°	537.3	524.3	519.0	504.7	483.8	477.3	348.2	211.3	121.3	73.0	56.1
40°	418.6	418.6	417.3	401.7	395.2	391.2	288.2	176.1	99.1	58.7	48.3
42.5°	333.9	337.8	335.2	328.6	314.3	311.7	240.0	143.5	80.9	49.6	40.4
45°	273.9	262.1	259.5	258.2	250.4	249.1	186.5	113.5	62.6	40.4	33.9
47.5°	200.8	199.5	202.1	195.6	186.5	194.3	147.4	86.1	49.6	32.6	28.7
50°	146.1	148.7	148.7	142.2	139.5	142.2	113.5	65.2	36.5	26.1	24.8
52.5°	109.5	108.2	106.9	108.2	106.9	106.9	84.8	48.3	28.7	20.9	19.6
55°	78.2	78.2	76.9	79.6	80.9	78.2	63.9	35.2	22.2	17.0	15.6
57.5°	54.8	54.8	52.2	54.8	54.8	57.4	45.6	26.1	18.3	13.0	13.0
60°	36.5	36.5	36.5	37.8	39.1	39.1	31.3	18.3	14.3	10.4	10.4
62.5°	24.8	24.8	24.8	26.1	26.1	28.7	22.2	14.3	11.7	9.1	7.8
65°	17.0	17.0	17.0	17.0	18.3	18.3	14.3	10.4	9.1	7.8	6.5
67.5°	10.4	11.7	10.4	11.7	11.7	11.7	9.1	7.8	6.5	5.2	3.9
70°	7.8	7.8	7.8	7.8	7.8	7.8	6.5	6.5	5.2	3.9	2.6
72.5°	5.2	5.2	5.2	5.2	5.2	5.2	3.9	3.9	3.9	2.6	2.6
75°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	1.3	1.3
77.5°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	0.0
80°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0
82.5°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	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°	523.0	523.0
2.5°	479.9	470.8
5°	406.9	417.3
7.5°	354.7	341.7
10°	297.3	289.5
12.5°	258.2	254.3
15°	213.9	204.8
17.5°	183.9	174.8
20°	153.9	147.4
22.5°	131.7	127.8
25°	113.5	108.2
27.5°	97.8	95.2
30°	84.8	84.8
32.5°	73.0	75.6
35°	65.2	66.5
37.5°	56.1	58.7
40°	52.2	54.8
42.5°	44.3	49.6
45°	37.8	41.7
47.5°	32.6	36.5
50°	27.4	31.3
52.5°	24.8	27.4
55°	20.9	22.2
57.5°	17.0	18.3
60°	13.0	14.3
62.5°	10.4	11.7
65°	7.8	7.8
67.5°	5.2	6.5
70°	2.6	3.9
72.5°	1.3	1.3
75°	1.3	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)