

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: P601171

Luminaire Tested: **ML406AWW9FS1E - TIR4D25AWW - TL43R2G\_ TL44S2G\_ 2700K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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**Test Information**

Test Method: LM-79-08  
 Report Number: P601171  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Issue Date: 7/29/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: HALO  
 Catalog Number: ML406AWW9FS1E - TIR4D25AWW - TL43R2G\_ TL44S2G\_ 2700K  
 Description: RETROFIT, 25D WW OPTIC, DIFFUSE CLEAR LENS TRIM  
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 2700K CCT  
 Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 579.0 lumens  
 Efficiency: N/A  
 Efficacy: 69.8 lumens/watt  
 Spacing Criteria (0/90/45): 1.33 / 0.62 / 0.83  
 Luminous Opening: Circular (Dia: 0.21' x H: 0')  
 CIE Type: Direct

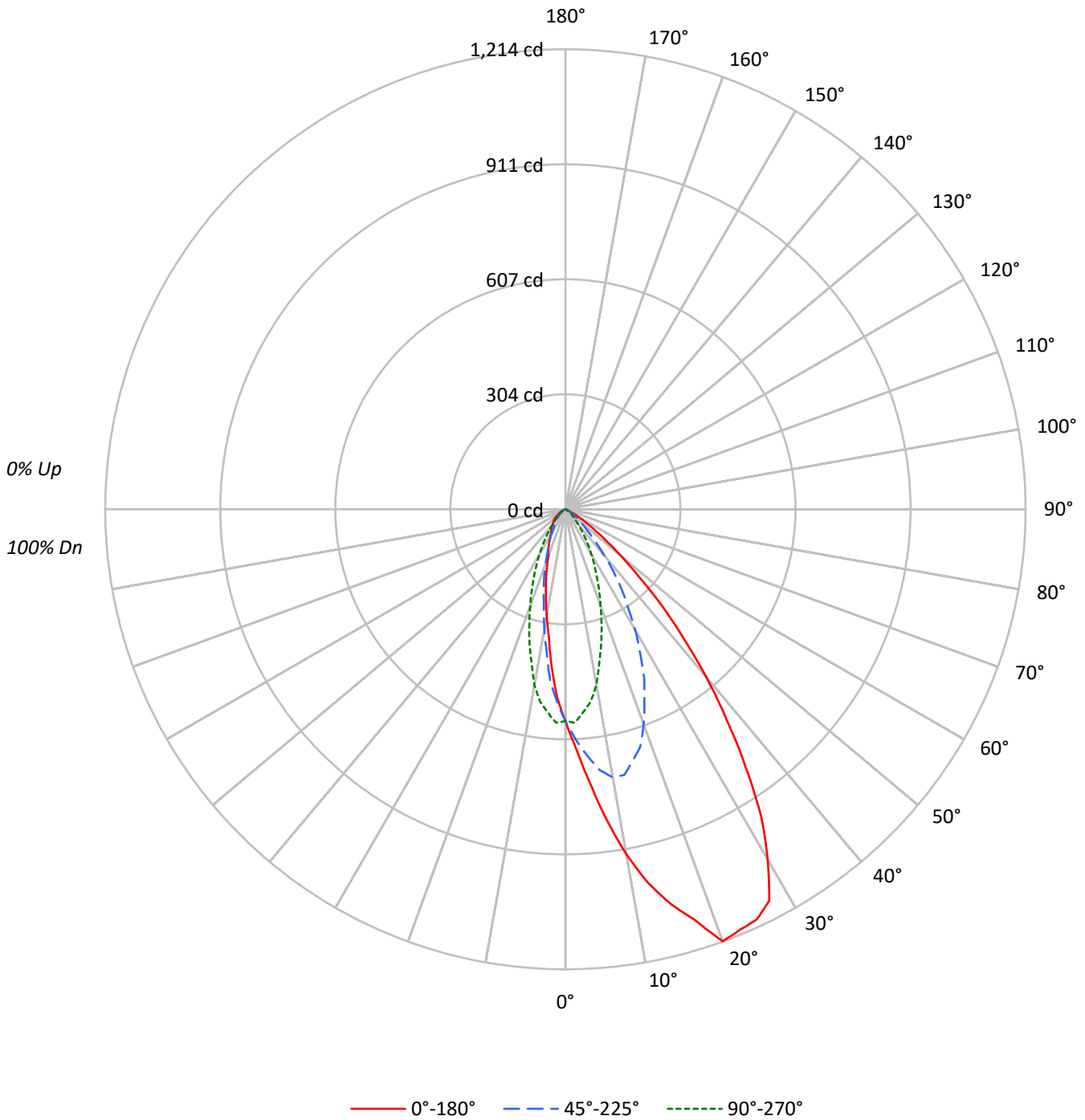
Input Watts (W): 8.3  
 Input Voltage (V): NR  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: NR  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 25 FT



Meas			
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	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	105	110	108	105	103	104	102	100	100	98	97	97	95	94	92
2	107	101	97	93	104	100	96	92	96	93	90	93	91	88	91	88	86	85
3	101	94	88	84	99	92	87	83	89	85	82	87	83	80	85	82	79	78
4	95	87	81	76	93	85	80	75	83	78	75	81	77	74	79	76	73	71
5	89	80	74	69	88	79	73	69	78	72	68	76	71	68	74	70	67	65
6	84	75	68	64	83	74	68	63	72	67	63	71	66	62	70	65	62	60
7	80	70	63	59	78	69	63	58	68	62	58	66	62	58	65	61	57	56
8	76	65	59	54	74	65	59	54	64	58	54	62	57	54	61	57	53	52
9	72	61	55	51	70	61	55	50	60	54	50	59	54	50	58	53	50	48
10	68	58	51	47	67	57	51	47	56	51	47	55	50	47	55	50	47	45

**AVERAGE LUMINANCE (cd/sqm):**

	0°	90°	180°
0°	176418	176418	176418
5°	228188	170435	131702
10°	296332	150891	90868
15°	352860	119483	64792
20°	407773	90829	43751
25°	416174	68358	35921
30°	389153	49660	28112
35°	319176	33575	25095
40°	238129	21888	21888
45°	160538	14736	19247
50°	93926	10807	16702
55°	49602	7707	13212
60°	23998	4421	10104
65°	9713	2989	6724
70°	4616	1846	3693
75°	2440	1220	0
80°	1818	1818	0
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	51.9	9.0
10°-20°	134.3	23.2
20°-30°	164.5	28.4
30°-40°	128.9	22.3
40°-50°	66.4	11.5
50°-60°	25.2	4.4
60°-70°	6.4	1.1
70°-80°	1.3	0.2
80°-90°	0.1	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>350.7</b>	<b>60.6</b>
<b>0°-40°</b>	<b>479.6</b>	<b>82.8</b>
<b>0°-60°</b>	<b>571.2</b>	<b>98.7</b>
<b>0°-90°</b>	<b>579.0</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>579.0</b>	<b>100.0</b>

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	559	559	559	559	559	
5°	720	652	538	456	416	75
15°	1079	687	366	219	198	308
25°	1194	491	196	102	103	542
35°	828	260	87	48	65	514
45°	360	90	33	26	43	280
55°	90	28	14	12	24	87
65°	13	5	4	4	9	16
75°	2	1	1	1	0	2
85°	0	0	0	0	0	0
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°	558.7	558.7	558.7	558.7	558.7	558.7	558.7	558.7	558.7	558.7	558.7
2.5°	629.8	626.8	642.8	619.8	604.8	624.8	606.8	585.7	563.7	526.7	507.6
5°	719.9	721.9	724.9	717.9	714.9	712.9	651.8	594.7	537.7	481.6	455.6
7.5°	823.0	804.0	816.0	789.0	794.0	780.0	693.9	585.7	511.6	439.6	378.5
10°	924.2	903.1	913.1	888.1	882.1	870.1	717.9	561.7	470.6	373.5	321.4
12.5°	1010.3	1001.3	991.2	957.2	945.2	912.1	717.9	529.7	412.5	322.4	262.3
15°	1079.4	1070.3	1059.3	1015.3	978.2	949.2	686.9	484.6	365.5	276.3	219.3
17.5°	1136.4	1101.4	1102.4	1039.3	1007.3	969.2	656.8	438.6	316.4	231.3	186.2
20°	1213.5	1149.4	1138.4	1071.3	1011.3	969.2	603.8	388.5	270.3	195.2	153.2
22.5°	1201.5	1144.4	1157.5	1058.3	994.3	977.2	544.7	335.4	232.3	164.2	123.2
25°	1194.5	1153.5	1131.4	1025.3	948.2	894.1	490.6	293.4	196.2	135.2	102.1
27.5°	1164.5	1102.4	1069.3	962.2	877.1	833.0	426.5	248.3	164.2	107.1	86.1
30°	1067.3	1022.3	987.2	875.1	785.0	742.9	369.5	206.3	136.2	88.1	68.1
32.5°	962.2	923.2	869.1	777.0	673.8	632.8	306.4	176.2	111.1	70.1	57.1
35°	828.0	796.0	744.9	651.8	552.7	534.7	260.3	141.2	87.1	56.1	48.1
37.5°	697.9	669.8	617.8	533.7	456.6	430.5	210.3	113.1	70.1	46.1	41.1
40°	577.7	544.7	510.6	428.5	365.5	337.4	161.2	88.1	53.1	37.0	35.0
42.5°	459.6	439.6	402.5	342.4	280.4	262.3	120.2	66.1	42.1	31.0	30.0
45°	359.5	338.4	303.4	263.3	211.3	197.2	90.1	51.1	33.0	25.0	26.0
47.5°	262.3	252.3	229.3	195.2	161.2	145.2	68.1	40.1	26.0	21.0	22.0
50°	191.2	181.2	170.2	139.2	112.1	108.1	51.1	31.0	22.0	17.0	18.0
52.5°	132.2	131.2	119.1	99.1	82.1	75.1	39.0	24.0	18.0	14.0	15.0
55°	90.1	89.1	81.1	69.1	58.1	53.1	28.0	18.0	14.0	11.0	12.0
57.5°	58.1	59.1	54.1	47.1	38.0	35.0	19.0	13.0	10.0	8.0	9.0
60°	38.0	38.0	33.0	30.0	24.0	22.0	13.0	9.0	7.0	6.0	7.0
62.5°	23.0	24.0	21.0	17.0	15.0	13.0	8.0	6.0	5.0	4.0	5.0
65°	13.0	14.0	12.0	10.0	9.0	8.0	5.0	4.0	4.0	3.0	4.0
67.5°	8.0	8.0	7.0	6.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
70°	5.0	5.0	4.0	4.0	3.0	3.0	2.0	3.0	2.0	2.0	2.0
72.5°	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0
75°	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
77.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
80°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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°	558.7	558.7
2.5°	495.6	497.6
5°	427.5	415.5
7.5°	355.4	336.4
10°	287.4	283.4
12.5°	242.3	237.3
15°	203.3	198.2
17.5°	170.2	161.2
20°	142.2	130.2
22.5°	118.1	119.1
25°	101.1	103.1
27.5°	87.1	89.1
30°	73.1	77.1
32.5°	66.1	72.1
35°	57.1	65.1
37.5°	51.1	59.1
40°	45.1	53.1
42.5°	40.1	48.1
45°	35.0	43.1
47.5°	31.0	39.0
50°	26.0	34.0
52.5°	22.0	29.0
55°	18.0	24.0
57.5°	15.0	20.0
60°	12.0	16.0
62.5°	9.0	12.0
65°	6.0	9.0
67.5°	4.0	6.0
70°	3.0	4.0
72.5°	1.0	2.0
75°	0.0	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)