

Scaled data based on original data using

LM-41-14 Approved Method for Photometric Testing Of Indoor Fluorescent Luminaires

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: HALO

Report Number: P277715

Luminaire Tested: **ML4D09_D2WE - TIR50AWW25 - TL45R6GMWBB - TL46S6GMWBB**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P277715
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-893-20)
Test Lab: INNOVATION CENTER(G3)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: ML4D09_D2WE - TIR50AWW25 - TL45R6GMWBB - TL46S6GMWBB
Description: ML4 900LM 3000K, D2W, 25° ASYMM WW, WITH SQUARE ASYMM WW, LINEAR SPREAD LENS, MATTE WHITE FLANGE, BLACK LENS FRAME
Light Source: (1) HIGH LUMEN LED 90CRI / 3000K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 339.9 lumens
Efficiency: N/A
Efficacy: 28.3 lumens/watt
Spacing Criteria (0/90/45): 1.26 / 0.77 / 1.07
Luminous Opening: Rectangular (W 0.17' x L: 0.17' x H: 0')
CIE Type: Direct

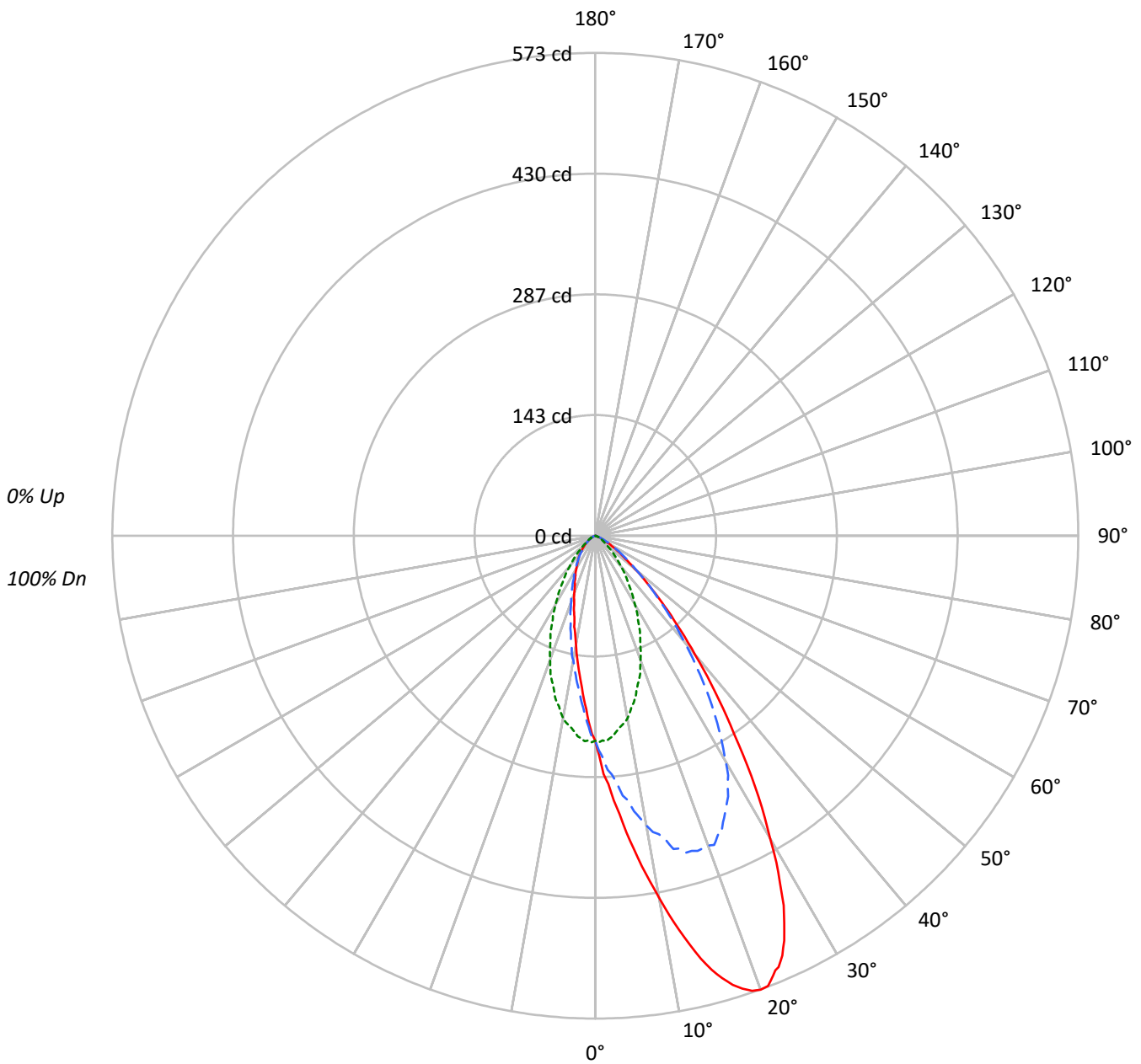
Input Watts (W): 12
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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Luminous Intensity Polar Plot



— 0°-180° - - - 45°-225° ···· 90°-270°



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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	0		
RCR																										
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100					100			
1	113	110	107	104	110	107	105	103	103	101	99	100	98	96	96	95	94	92					92			
2	106	100	96	92	104	99	94	91	95	92	89	92	89	87	90	87	85	83					83			
3	100	92	87	82	97	91	86	81	88	84	80	86	82	79	83	80	77	76					76			
4	94	85	79	74	92	84	78	73	81	76	72	79	75	71	77	74	71	69					69			
5	88	78	72	67	86	77	71	66	75	70	66	74	69	65	72	68	65	63					63			
6	83	73	66	61	81	72	65	61	70	64	60	69	64	60	67	63	59	58					58			
7	78	67	61	56	76	67	60	56	65	59	55	64	59	55	63	58	55	53					53			
8	74	63	56	51	72	62	56	51	61	55	51	60	55	51	59	54	51	49					49			
9	69	59	52	47	68	58	52	47	57	51	47	56	51	47	55	50	47	45					45			
10	66	55	48	44	65	54	48	44	54	48	44	53	47	44	52	47	44	42					42			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	94201	94201	94201
5°	129180	93005	70444
10°	171635	86604	51978
15°	213903	75861	38913
20°	236369	64783	30103
25°	226691	53445	23943
30°	185779	42060	20135
35°	135812	32167	17030
40°	93126	23775	14164
45°	61377	16988	11508
50°	37376	11454	9043
55°	22970	8107	6756
60°	13175	6200	5425
65°	6418	4585	3668
70°	2266	2266	2266
75°	1497	1497	1497
80°	0	0	0
85°	0	0	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	23.7	7.0
10°-20°	70.5	20.8
20°-30°	96.4	28.4
30°-40°	78.8	23.2
40°-50°	44.1	13.0
50°-60°	18.9	5.6
60°-70°	6.3	1.9
70°-80°	1.2	0.3
80°-90°	0.0	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°	190.6	56.1
0°-40°	269.4	79.3
0°-60°	332.4	97.8
0°-90°	339.9	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	339.9	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	243	243	243	243	243	
5°	332	295	239	195	181	35
15°	533	384	189	114	97	150
25°	530	364	125	64	56	237
35°	287	236	68	36	36	181
45°	112	106	31	20	21	88
55°	34	38	12	10	10	32
65°	7	10	5	4	4	8
75°	1	1	1	1	1	1
85°	0	0	0	0	0	0
90°	0	0	0	0	0	0



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	243.1	243.1	243.1	243.1	243.1	243.1	243.1	243.1	243.1	243.1	243.1
1°	261.1	257.1	259.1	256.1	257.1	252.1	258.1	256.1	256.1	254.1	255.1
2°	283.1	272.1	274.1	271.1	272.1	271.1	271.1	273.1	269.1	270.1	264.1
3°	295.1	288.1	289.1	287.1	290.1	288.1	290.1	288.1	282.1	280.1	278.1
4°	315.1	310.1	308.1	301.1	307.1	301.1	306.1	301.1	298.1	294.1	284.1
5°	332.1	327.1	332.1	325.1	324.1	321.1	322.1	316.1	309.1	305.1	295.1
6°	354.1	346.1	350.1	344.1	343.1	340.1	336.1	330.1	323.1	317.1	310.1
7°	374.1	363.1	367.1	361.1	361.1	357.1	353.1	347.1	340.1	329.1	316.1
8°	396.2	394.2	387.2	382.1	377.1	370.1	369.1	361.1	352.1	342.1	330.1
9°	415.2	413.2	414.2	398.2	394.2	391.2	388.2	385.2	363.1	353.1	339.1
10°	436.2	438.2	430.2	418.2	414.2	410.2	404.2	400.2	376.1	364.1	349.1
11°	458.2	451.2	452.2	440.2	430.2	417.2	422.2	413.2	389.2	375.1	358.1
12°	478.2	472.2	474.2	458.2	453.2	443.2	438.2	421.2	401.2	388.2	362.1
13°	498.2	489.2	495.2	475.2	466.2	449.2	452.2	433.2	411.2	394.2	370.1
14°	517.2	512.2	512.2	488.2	484.2	474.2	469.2	450.2	425.2	404.2	383.2
15°	533.2	526.2	517.2	501.2	496.2	480.2	481.2	460.2	434.2	413.2	384.2
16°	546.2	535.2	533.2	516.2	509.2	496.2	484.2	466.2	441.2	416.2	391.2
17°	557.2	556.2	548.2	527.2	515.2	505.2	499.2	473.2	448.2	420.2	391.2
18°	565.2	559.2	557.2	538.2	522.2	511.2	506.2	480.2	452.2	423.2	393.2
19°	571.2	564.2	567.2	541.2	528.2	510.2	505.2	487.2	450.2	424.2	392.2
20°	573.2	567.2	560.2	545.2	530.2	519.2	508.2	488.2	454.2	424.2	391.2
21°	572.2	566.2	559.2	543.2	533.2	513.2	506.2	490.2	449.2	423.2	393.2
22.5°	558.2	556.2	552.2	533.2	522.2	507.2	504.2	480.2	447.2	419.2	382.1
23°	556.2	546.2	550.2	530.2	517.2	505.2	499.2	474.2	443.2	417.2	383.2
24°	545.2	540.2	535.2	521.2	508.2	498.2	484.2	467.2	429.2	406.2	372.1
25°	530.2	523.2	523.2	508.2	496.2	482.2	468.2	458.2	428.2	401.2	364.1
26°	511.2	506.2	505.2	492.2	481.2	470.2	458.2	444.2	416.2	391.2	355.1
27°	492.2	485.2	493.2	472.2	461.2	454.2	448.2	427.2	402.2	377.1	347.1
28°	466.2	466.2	473.2	449.2	441.2	432.2	430.2	412.2	388.2	363.1	334.1
29°	443.2	442.2	439.2	429.2	420.2	414.2	411.2	398.2	373.1	349.1	325.1
30°	415.2	418.2	416.2	405.2	400.2	392.2	386.2	377.1	351.1	333.1	309.1
32.5°	353.1	353.1	349.1	349.1	342.1	336.1	333.1	331.1	309.1	295.1	273.1
35°	287.1	287.1	286.1	282.1	282.1	279.1	277.1	273.1	264.1	253.1	236.1
37.5°	233.1	233.1	233.1	229.1	232.1	228.1	224.1	226.1	217.1	214.1	199.1
40°	184.1	185.1	186.1	182.1	182.1	183.1	179.1	184.1	178.1	173.1	164.1
42.5°	143.1	143.1	144.1	143.1	146.1	144.1	141.1	146.1	143.1	140.1	134.1
45°	112.0	112.0	113.0	113.0	116.0	113.0	112.0	113.0	111.0	110.0	106.0
47.5°	83.0	84.0	86.0	85.0	86.0	87.0	87.0	89.0	88.0	88.0	84.0
50°	62.0	63.0	64.0	64.0	67.0	67.0	66.0	69.0	68.0	67.0	64.0
52.5°	45.0	48.0	48.0	50.0	49.0	50.0	50.0	53.0	53.0	52.0	50.0
55°	34.0	34.0	35.0	35.0	36.0	37.0	37.0	39.0	39.0	39.0	38.0
57.5°	25.0	25.0	26.0	26.0	27.0	27.0	27.0	28.0	29.0	29.0	28.0
60°	17.0	17.0	18.0	18.0	19.0	19.0	19.0	20.0	21.0	21.0	20.0
62.5°	11.0	11.0	12.0	12.0	13.0	13.0	14.0	14.0	15.0	15.0	14.0
65°	7.0	7.0	7.0	8.0	8.0	9.0	9.0	10.0	10.0	10.0	10.0



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	4.0	4.0	4.0	5.0	5.0	5.0	6.0	6.0	7.0	7.0	6.0
70°	2.0	2.0	2.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0
72.5°	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0
75°	1.0	1.0	1.0	1.0	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	1.0
80°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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):

	67.5°	90°	112.5°	135°	157.5°	180°
0°	243.1	243.1	243.1	243.1	243.1	243.1
1°	249.1	245.1	240.1	238.1	234.1	235.1
2°	255.1	243.1	233.1	227.1	224.1	221.1
3°	259.1	244.1	227.1	216.1	210.1	206.1
4°	264.1	241.1	220.1	205.1	193.1	194.1
5°	268.1	239.1	213.1	195.1	182.1	181.1
6°	270.1	234.1	206.1	185.1	174.1	171.1
7°	275.1	230.1	199.1	176.1	162.1	160.1
8°	280.1	227.1	191.1	167.1	155.1	151.1
9°	279.1	224.1	183.1	159.1	144.1	141.1
10°	281.1	220.1	176.1	150.1	136.1	132.1
11°	278.1	214.1	168.1	145.1	128.1	124.0
12°	278.1	207.1	160.1	135.1	119.0	116.0
13°	276.1	203.1	153.1	128.1	112.0	111.0
14°	275.1	197.1	146.1	120.0	107.0	102.0
15°	273.1	189.1	139.1	114.0	99.0	97.0
16°	269.1	183.1	133.1	106.0	94.0	92.0
17°	270.1	178.1	127.0	101.0	89.0	86.0
18°	262.1	172.1	119.0	96.0	84.0	81.0
19°	258.1	164.1	113.0	89.0	79.0	78.0
20°	252.1	157.1	108.0	84.0	75.0	73.0
21°	245.1	150.1	101.0	80.0	71.0	69.0
22.5°	238.1	140.1	93.0	74.0	65.0	63.0
23°	233.1	136.1	92.0	72.0	63.0	62.0
24°	225.1	131.1	86.0	67.0	60.0	60.0
25°	220.1	125.0	81.0	64.0	58.0	56.0
26°	214.1	118.0	76.0	60.0	54.0	54.0
27°	206.1	111.0	72.0	56.0	51.0	52.0
28°	195.1	107.0	68.0	54.0	49.0	50.0
29°	187.1	100.0	63.0	51.0	47.0	47.0
30°	179.1	94.0	60.0	48.0	45.0	45.0
32.5°	159.1	81.0	51.0	42.0	40.0	40.0
35°	139.1	68.0	43.0	36.0	35.0	36.0
37.5°	120.0	58.0	36.0	31.0	31.0	32.0
40°	102.0	47.0	30.0	27.0	27.0	28.0
42.5°	84.0	39.0	26.0	23.0	24.0	24.0
45°	67.0	31.0	21.0	20.0	21.0	21.0
47.5°	53.0	25.0	17.0	17.0	18.0	18.0
50°	40.0	19.0	14.0	14.0	15.0	15.0
52.5°	31.0	15.0	11.0	12.0	13.0	12.0
55°	22.0	12.0	9.0	10.0	10.0	10.0
57.5°	17.0	10.0	8.0	8.0	9.0	8.0
60°	13.0	8.0	6.0	7.0	7.0	7.0
62.5°	10.0	6.0	5.0	5.0	5.0	5.0
65°	7.0	5.0	4.0	4.0	4.0	4.0



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CANDELA DISTRIBUTION (continued):

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	5.0	4.0	3.0	3.0	3.0	3.0
70°	3.0	2.0	2.0	2.0	2.0	2.0
72.5°	2.0	2.0	2.0	2.0	1.0	1.0
75°	1.0	1.0	1.0	1.0	1.0	1.0
77.5°	1.0	1.0	0.0	0.0	0.0	0.0
80°	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	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
87.5°	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

(END OF REPORT)