

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: P277714

Luminaire Tested: **ML4D09_D2WE - TIR50AWW25 - TL41RMW - TL42SMW**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P277714
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-893-19)
Test Lab: INNOVATION CENTER(G3)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: ML4D09_D2WE - TIR50AWW25 - TL41RMW - TL42SMW
Description: ML4 900LM 3000K, D2W, 25° ASYMM WW, WITH ROUND PINHOLE MATTE WHITE FLANGE
Light Source: (1) HIGH LUMEN LED 90CRI / 3000K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 400.5 lumens
Efficiency: N/A
Efficacy: 33.4 lumens/watt
Spacing Criteria (0/90/45): 1.36 / 0.61 / 0.87
Luminous Opening: Circular (Dia: 0.17' x H: 0')
CIE Type: Direct

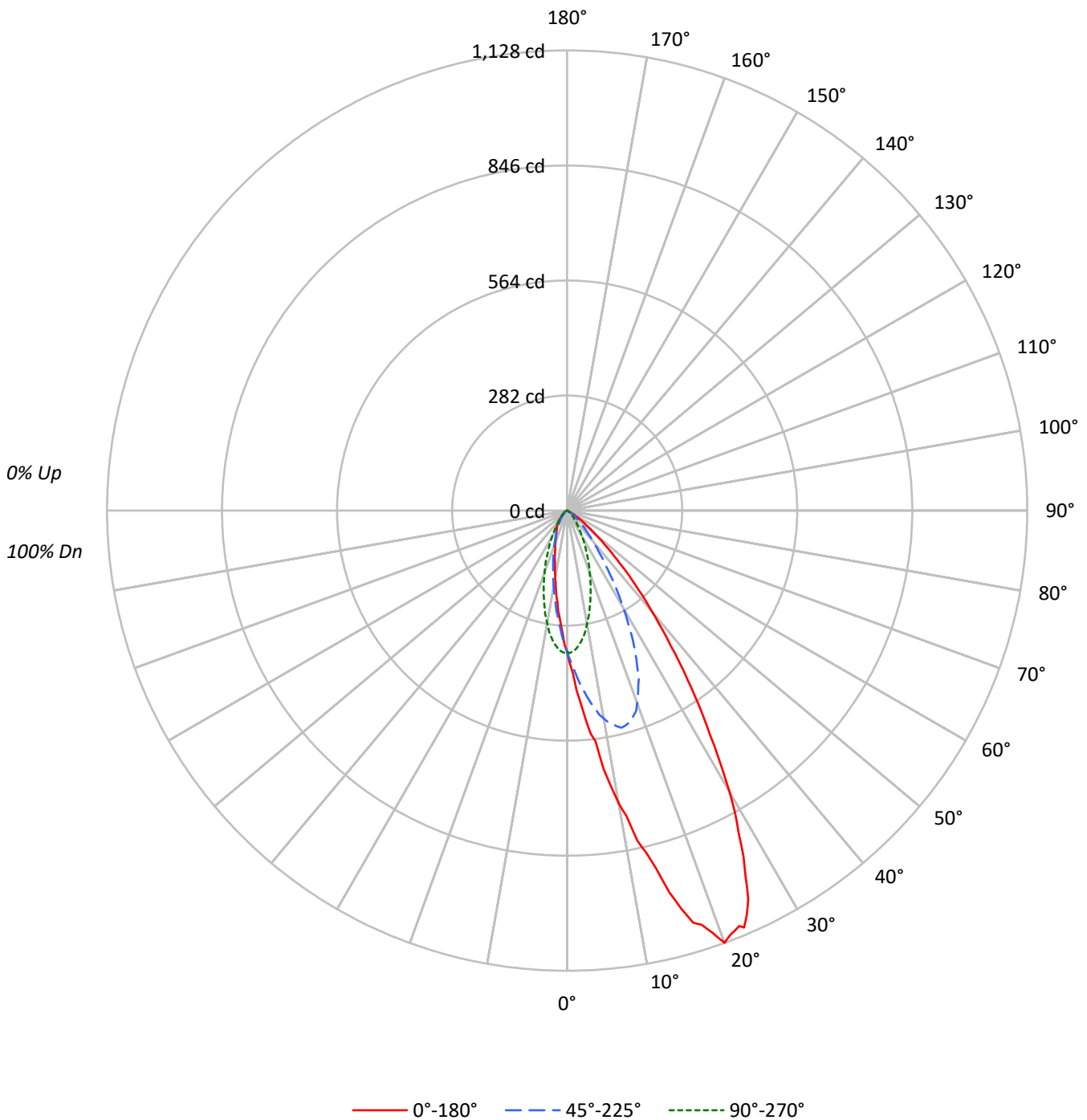
Input Watts (W): 12
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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Luminous Intensity Polar Plot





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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	108	105	111	108	106	104	104	102	100	100	99	97	97	96	95	93					93			
2	107	102	98	94	105	100	96	93	97	94	91	94	91	89	91	89	87	86					86			
3	101	95	89	85	99	93	88	84	90	86	83	88	85	82	86	83	80	79					79			
4	96	88	82	77	94	87	81	77	84	80	76	82	78	75	80	77	74	73					73			
5	91	82	75	71	89	81	75	71	79	74	70	77	73	69	76	72	69	67					67			
6	86	76	70	65	84	75	69	65	74	69	65	72	68	64	71	67	64	62					62			
7	81	71	65	60	80	71	65	60	69	64	60	68	63	60	67	63	59	58					58			
8	77	67	60	56	76	66	60	56	65	60	56	64	59	56	63	59	55	54					54			
9	73	63	57	52	72	62	56	52	61	56	52	60	55	52	60	55	52	50					50			
10	69	59	53	49	68	59	53	49	58	52	49	57	52	49	56	52	48	47					47			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	170463	170463	170463
5°	252931	164131	123469
10°	365723	140979	84768
15°	495103	113037	59864
20°	591987	84637	44156
25°	571821	60481	34351
30°	452973	41645	28542
35°	320246	27164	25959
40°	208933	18034	19966
45°	127129	13257	12559
50°	69157	9211	9978
55°	37074	6021	8602
60°	16775	3947	6907
65°	4670	2335	4670
70°	0	1443	2885
75°	0	0	0
80°	0	0	0
85°	0	0	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	33.9	8.5
10°-20°	101.3	25.3
20°-30°	127.3	31.8
30°-40°	83.7	20.9
40°-50°	37.9	9.5
50°-60°	13.2	3.3
60°-70°	3.0	0.7
70°-80°	0.1	0.0
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°	262.5	65.5
0°-40°	346.2	86.5
0°-60°	397.4	99.2
0°-90°	400.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	400.5	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	346	346	346	346	346	
5°	511	440	331	261	249	55
15°	969	547	221	133	117	275
25°	1050	402	111	65	63	464
35°	532	165	45	31	43	334
45°	182	58	19	13	18	146
55°	43	17	7	6	10	41
65°	4	3	2	2	4	6
75°	0	0	0	0	0	0
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°	345.5	345.5	345.5	345.5	345.5	345.5	345.5	345.5	345.5	345.5	345.5
1°	374.5	372.5	364.5	370.5	369.5	367.5	365.5	368.5	362.5	359.5	364.5
2°	399.5	402.5	393.5	398.5	393.5	395.5	394.5	391.5	390.5	381.5	382.5
3°	440.6	435.6	421.6	425.6	422.6	424.6	419.6	419.6	413.6	405.5	400.5
4°	472.6	468.6	461.6	461.6	459.6	455.6	452.6	446.6	437.6	426.6	420.6
5°	510.7	507.7	498.7	497.7	486.7	482.6	477.6	475.6	462.6	442.6	439.6
6°	549.7	543.7	533.7	527.7	522.7	515.7	512.7	506.7	492.7	471.6	456.6
7°	569.8	583.8	577.8	570.8	552.7	544.7	543.7	530.7	512.7	489.7	474.6
8°	638.9	632.9	620.8	610.8	594.8	583.8	581.8	560.8	536.7	511.7	488.7
9°	682.9	677.9	662.9	651.9	630.8	622.8	606.8	589.8	564.8	530.7	506.7
10°	730.0	725.0	701.9	687.9	669.9	655.9	649.9	617.8	584.8	548.7	517.7
11°	762.0	768.0	749.0	733.0	705.9	688.9	667.9	649.9	604.8	564.8	528.7
12°	827.1	815.1	793.1	776.0	747.0	729.0	710.0	668.9	617.8	578.8	534.7
13°	860.2	870.2	852.1	821.1	780.0	753.0	741.0	687.9	636.9	588.8	542.7
14°	905.2	917.2	887.2	856.2	813.1	788.1	758.0	714.0	654.9	594.8	548.7
15°	969.3	966.3	934.3	894.2	846.1	818.1	793.1	727.0	665.9	601.8	546.7
16°	1015.4	1004.4	970.3	926.2	867.2	842.1	799.1	749.0	671.9	604.8	542.7
17°	1056.4	1050.4	996.3	957.3	887.2	859.2	826.1	747.0	669.9	604.8	539.7
18°	1067.4	1076.4	1040.4	979.3	907.2	871.2	828.1	751.0	674.9	596.8	527.7
19°	1094.5	1104.5	1058.4	996.3	917.2	878.2	840.1	757.0	668.9	585.8	519.7
20°	1127.5	1120.5	1064.4	1002.3	923.2	873.2	830.1	746.0	657.9	573.8	502.7
21°	1114.5	1120.5	1065.4	999.3	915.2	866.2	826.1	741.0	649.9	563.8	483.7
22.5°	1102.5	1105.5	1057.4	981.3	891.2	850.1	795.1	720.0	608.8	528.7	456.6
23°	1110.5	1098.5	1039.4	972.3	877.2	836.1	787.1	686.9	602.8	517.7	449.6
24°	1083.5	1076.4	1011.4	937.3	848.1	802.1	756.0	667.9	576.8	498.7	423.6
25°	1050.4	1041.4	987.3	906.2	817.1	771.0	719.0	635.9	553.7	468.6	401.5
26°	998.3	1000.3	939.3	871.2	767.0	737.0	693.9	601.8	513.7	445.6	376.5
27°	952.3	954.3	891.2	825.1	734.0	691.9	648.9	571.8	488.7	409.6	352.5
28°	895.2	893.2	844.1	773.0	690.9	647.9	604.8	542.7	451.6	382.5	324.4
29°	850.1	842.1	799.1	725.0	645.9	604.8	561.8	494.7	418.6	364.5	300.4
30°	795.1	786.1	732.0	674.9	600.8	554.7	526.7	449.6	385.5	327.4	275.4
32.5°	652.9	647.9	604.8	554.7	489.7	468.6	424.6	358.5	311.4	259.3	219.3
35°	531.7	521.7	489.7	443.6	393.5	365.5	336.5	282.4	239.3	197.3	165.2
37.5°	416.6	410.6	394.5	352.5	308.4	284.4	263.4	224.3	185.2	153.2	128.2
40°	324.4	320.4	302.4	275.4	239.3	222.3	200.3	169.2	141.2	120.2	99.1
42.5°	248.3	243.3	230.3	207.3	180.2	169.2	154.2	129.2	110.1	91.1	75.1
45°	182.2	181.2	167.2	152.2	133.2	125.2	114.2	96.1	82.1	69.1	58.1
47.5°	129.2	128.2	119.2	110.1	96.1	94.1	84.1	72.1	61.1	52.1	44.1
50°	90.1	90.1	85.1	77.1	69.1	65.1	61.1	52.1	44.1	38.1	33.0
52.5°	62.1	62.1	59.1	56.1	49.1	46.1	43.1	37.0	32.0	27.0	24.0
55°	43.1	43.1	41.1	37.0	33.0	32.0	29.0	25.0	22.0	19.0	17.0
57.5°	28.0	28.0	26.0	24.0	22.0	20.0	19.0	18.0	15.0	13.0	11.0
60°	17.0	17.0	16.0	15.0	14.0	13.0	12.0	11.0	9.0	8.0	7.0
62.5°	10.0	10.0	9.0	9.0	8.0	8.0	7.0	6.0	6.0	5.0	5.0
65°	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
70°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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°	345.5	345.5	345.5	345.5	345.5	345.5
1°	355.5	349.5	342.5	333.4	333.4	330.4
2°	361.5	346.5	328.4	313.4	304.4	304.4
3°	371.5	343.5	315.4	294.4	286.4	282.4
4°	370.5	337.5	306.4	279.4	267.4	262.4
5°	379.5	331.4	292.4	261.4	250.3	249.3
6°	384.5	323.4	277.4	248.3	230.3	226.3
7°	379.5	314.4	263.4	231.3	216.3	213.3
8°	384.5	305.4	252.3	216.3	202.3	196.3
9°	382.5	293.4	237.3	203.3	186.3	180.2
10°	376.5	281.4	224.3	189.3	174.2	169.2
11°	370.5	270.4	215.3	177.2	161.2	155.2
12°	365.5	259.3	202.3	165.2	150.2	144.2
13°	356.5	245.3	186.3	152.2	138.2	134.2
14°	343.5	232.3	175.2	142.2	127.2	124.2
15°	332.4	221.3	163.2	133.2	120.2	117.2
16°	323.4	208.3	152.2	124.2	111.1	108.1
17°	309.4	196.3	141.2	114.2	103.1	101.1
18°	295.4	185.2	132.2	106.1	97.1	95.1
19°	279.4	173.2	124.2	99.1	91.1	90.1
20°	267.4	161.2	114.2	92.1	85.1	84.1
21°	251.3	152.2	106.1	86.1	80.1	79.1
22.5°	230.3	137.2	95.1	76.1	73.1	72.1
23°	222.3	132.2	93.1	74.1	70.1	70.1
24°	207.3	122.2	85.1	68.1	65.1	66.1
25°	193.3	111.1	79.1	65.1	62.1	63.1
26°	180.2	104.1	74.1	58.1	58.1	59.1
27°	168.2	96.1	67.1	55.1	55.1	58.1
28°	153.2	88.1	61.1	51.1	52.1	55.1
29°	143.2	81.1	56.1	48.1	49.1	52.1
30°	129.2	73.1	52.1	44.1	47.1	50.1
32.5°	102.1	58.1	41.1	37.0	41.1	47.1
35°	77.1	45.1	33.0	31.0	37.0	43.1
37.5°	60.1	36.0	27.0	25.0	32.0	38.1
40°	47.1	28.0	22.0	20.0	26.0	31.0
42.5°	37.0	23.0	18.0	17.0	20.0	24.0
45°	30.0	19.0	14.0	13.0	16.0	18.0
47.5°	23.0	15.0	12.0	11.0	13.0	15.0
50°	18.0	12.0	9.0	9.0	11.0	13.0
52.5°	14.0	9.0	7.0	7.0	9.0	11.0
55°	10.0	7.0	6.0	6.0	8.0	10.0
57.5°	7.0	5.0	5.0	5.0	6.0	8.0
60°	5.0	4.0	4.0	4.0	5.0	7.0
62.5°	3.0	3.0	3.0	3.0	4.0	5.0
65°	2.0	2.0	2.0	2.0	3.0	4.0



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CANDELA DISTRIBUTION (continued):

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	1.0	1.0	1.0	1.0	2.0	3.0
70°	1.0	1.0	1.0	1.0	1.0	2.0
72.5°	0.0	0.0	0.0	0.0	0.0	0.0
75°	0.0	0.0	0.0	0.0	0.0	0.0
77.5°	0.0	0.0	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)