

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: P277711

Luminaire Tested: **ML4D09_D2WE - TIR50AWW25 - TL43R2GORBBB - TL44S2GORBBB**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P277711
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-893-16)
Test Lab: INNOVATION CENTER(G3)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: ML4D09_D2WE - TIR50AWW25 - TL43R2GORBBB - TL44S2GORBBB
Description: ML4 900LM 3000K, D2W, 25° ASYMM WW, WITH ROUND DIFFUSED CLEAR LENS,
OIL RUBBED BRONZE 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: 377.0 lumens
Efficiency: N/A
Efficacy: 31.4 lumens/watt
Spacing Criteria (0/90/45): 1.29 / 0.62 / 0.87
Luminous Opening: Circular (Dia: 0.17' x H: 0')
CIE Type: Direct

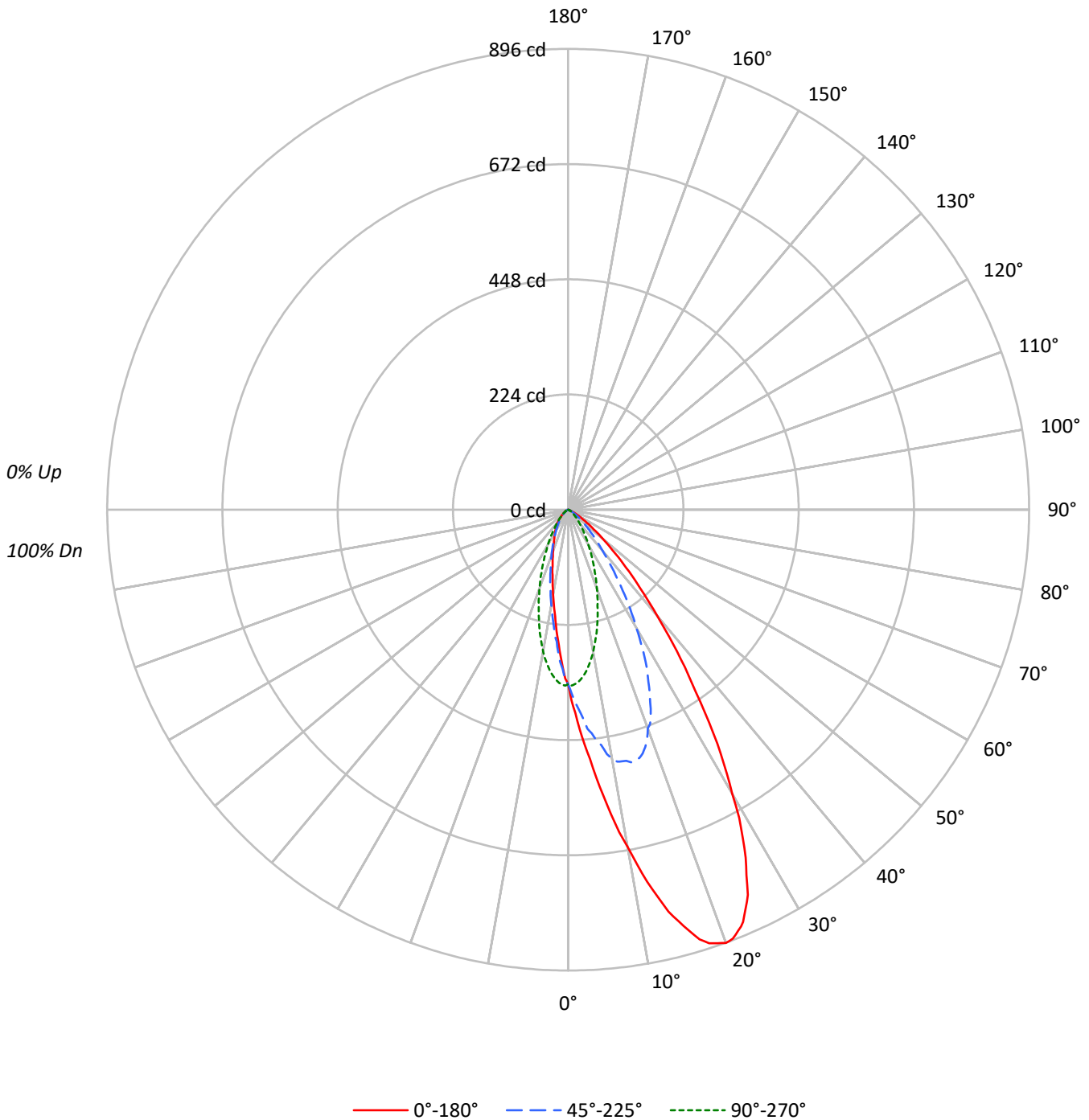
Input Watts (W): 12
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	107	105	111	108	106	103	104	102	100	100	99	97	97	95	94	93					93			
2	107	102	97	94	105	100	96	93	97	93	91	94	91	89	91	89	87	85					85			
3	101	94	89	84	99	93	88	84	90	86	82	87	84	81	85	82	80	78					78			
4	95	87	81	77	93	86	80	76	84	79	75	82	78	74	80	76	73	72					72			
5	90	81	75	70	88	80	74	70	78	73	69	76	72	68	75	71	68	66					66			
6	85	75	69	64	84	75	69	64	73	68	64	72	67	63	70	66	63	61					61			
7	80	71	64	60	79	70	64	59	69	63	59	67	62	59	66	62	58	57					57			
8	76	66	60	55	75	66	59	55	64	59	55	63	58	55	62	58	54	53					53			
9	72	62	56	52	71	62	56	51	61	55	51	60	55	51	59	54	51	49					49			
10	69	58	52	48	68	58	52	48	57	52	48	56	51	48	56	51	48	46					46			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	167305	167305	167305
5°	240797	161506	121885
10°	333309	140328	84718
15°	423082	112424	60783
20°	470649	85635	45154
25°	449825	62604	35385
30°	363643	45007	29055
35°	260316	31320	24092
40°	172673	21254	19966
45°	111011	15350	14653
50°	66778	10746	10746
55°	38708	6881	7742
60°	21709	4934	5921
65°	10507	3502	4670
70°	4328	1443	2885
75°	1906	1906	1906
80°	0	0	0
85°	0	0	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	32.9	8.7
10°-20°	93.4	24.8
20°-30°	113.4	30.1
30°-40°	78.9	20.9
40°-50°	37.9	10.0
50°-60°	14.9	3.9
60°-70°	4.6	1.2
70°-80°	0.9	0.2
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°	239.7	63.6
0°-40°	318.6	84.5
0°-60°	371.4	98.5
0°-90°	377.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	377.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	339	339	339	339	339	
5°	486	427	326	257	246	53
15°	828	504	220	134	119	234
25°	826	369	115	67	65	369
35°	432	171	52	34	40	274
45°	159	62	22	16	21	126
55°	45	20	8	7	9	43
65°	9	5	3	3	4	10
75°	1	1	1	1	1	1
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°	25°	30°	35°	40°	45°
0°	339.1	339.1	339.1	339.1	339.1	339.1	339.1	339.1	339.1	339.1	339.1
1°	370.1	365.1	355.1	361.1	358.1	361.1	359.1	364.1	358.1	353.1	356.1
2°	395.2	392.2	388.2	385.2	388.2	385.2	384.2	384.2	381.2	371.2	374.2
3°	427.2	420.2	417.2	415.2	413.2	412.2	410.2	409.2	402.2	397.2	388.2
4°	457.2	449.2	449.2	445.2	444.2	439.2	434.2	433.2	427.2	417.2	405.2
5°	486.2	483.2	480.2	477.2	473.2	466.2	459.2	456.2	449.2	435.2	427.2
6°	524.2	521.2	510.2	505.2	506.2	494.2	488.2	481.2	471.2	454.2	437.2
7°	560.2	554.2	550.2	537.2	525.2	525.2	516.2	512.2	492.2	468.2	452.2
8°	598.2	592.2	576.2	573.2	566.2	559.2	543.2	529.2	510.2	486.2	462.2
9°	635.3	622.3	617.2	602.2	587.2	584.2	568.2	551.2	532.2	500.2	481.2
10°	665.3	663.3	649.3	630.3	618.2	613.2	592.2	577.2	549.2	519.2	492.2
11°	703.3	698.3	681.3	664.3	648.3	636.3	619.3	600.2	566.2	531.2	499.2
12°	740.3	731.3	718.3	699.3	676.3	662.3	640.3	624.3	579.2	535.2	500.2
13°	772.3	761.3	744.3	727.3	697.3	687.3	658.3	632.3	595.2	543.2	501.2
14°	805.3	793.3	781.3	748.3	719.3	705.3	680.3	649.3	598.2	552.2	506.2
15°	828.3	832.3	805.3	764.3	737.3	723.3	694.3	658.3	609.2	556.2	504.2
16°	851.3	849.3	827.3	789.3	753.3	740.3	702.3	660.3	607.2	553.2	502.2
17°	873.4	859.3	836.3	804.3	762.3	740.3	710.3	668.3	605.2	550.2	495.2
18°	886.4	880.4	848.3	811.3	774.3	746.3	712.3	661.3	600.2	538.2	485.2
19°	891.4	888.4	855.3	812.3	772.3	745.3	710.3	656.3	603.2	532.2	471.2
20°	896.4	892.4	849.3	813.3	765.3	741.3	703.3	641.3	587.2	517.2	452.2
21°	893.4	888.4	850.3	805.3	763.3	731.3	692.3	635.3	572.2	506.2	445.2
22.5°	877.4	870.4	834.3	786.3	734.3	706.3	667.3	609.2	544.2	478.2	419.2
23°	870.4	855.3	822.3	776.3	724.3	693.3	658.3	598.2	533.2	469.2	407.2
24°	848.3	836.3	811.3	754.3	704.3	679.3	636.3	578.2	512.2	447.2	389.2
25°	826.3	809.3	788.3	736.3	681.3	650.3	614.2	564.2	488.2	428.2	369.1
26°	790.3	800.3	748.3	703.3	649.3	619.3	590.2	527.2	468.2	402.2	351.1
27°	759.3	753.3	725.3	675.3	626.3	594.2	561.2	506.2	438.2	378.2	331.1
28°	723.3	718.3	689.3	638.3	587.2	564.2	525.2	469.2	412.2	355.1	309.1
29°	685.3	682.3	642.3	605.2	563.2	528.2	496.2	442.2	387.2	338.1	286.1
30°	638.3	635.3	600.2	562.2	522.2	497.2	466.2	409.2	358.1	313.1	265.1
32.5°	539.2	535.2	512.2	470.2	434.2	412.2	386.2	345.1	298.1	254.1	217.1
35°	432.2	440.2	406.2	379.2	351.1	330.1	307.1	274.1	238.1	203.1	171.1
37.5°	347.1	339.1	325.1	301.1	275.1	259.1	243.1	216.1	189.1	159.1	134.1
40°	268.1	267.1	250.1	234.1	217.1	200.1	189.1	164.1	142.1	121.0	104.0
42.5°	207.1	204.1	199.1	180.1	164.1	158.1	144.1	127.1	110.0	94.0	80.0
45°	159.1	155.1	150.1	135.1	125.1	118.0	110.0	98.0	84.0	72.0	62.0
47.5°	117.0	116.0	110.0	103.0	95.0	90.0	84.0	73.0	65.0	55.0	48.0
50°	87.0	86.0	84.0	76.0	71.0	68.0	63.0	55.0	49.0	42.0	36.0
52.5°	63.0	63.0	59.0	56.0	52.0	50.0	47.0	42.0	36.0	32.0	28.0
55°	45.0	45.0	43.0	41.0	37.0	36.0	34.0	30.0	26.0	23.0	20.0
57.5°	32.0	31.0	31.0	29.0	26.0	25.0	24.0	21.0	19.0	17.0	15.0
60°	22.0	22.0	21.0	20.0	19.0	18.0	17.0	15.0	13.0	12.0	11.0
62.5°	15.0	15.0	14.0	13.0	12.0	12.0	11.0	10.0	9.0	8.0	7.0
65°	9.0	9.0	9.0	9.0	8.0	8.0	7.0	7.0	6.0	6.0	5.0



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CATALOG NUMBER: ML4D09_D2WE - TIR50AWW25 - TL43R2GORBBB - TL44S2GORBBB

CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	6.0	6.0	6.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	3.0
70°	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
72.5°	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0
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°	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°	339.1	339.1	339.1	339.1	339.1	339.1
1°	352.1	342.1	336.1	331.1	324.1	328.1
2°	357.1	340.1	328.1	310.1	306.1	306.1
3°	365.1	337.1	313.1	296.1	284.1	285.1
4°	371.2	332.1	306.1	278.1	265.1	263.1
5°	375.2	326.1	292.1	257.1	243.1	246.1
6°	379.2	319.1	277.1	246.1	228.1	226.1
7°	378.2	310.1	263.1	229.1	213.1	209.1
8°	378.2	301.1	249.1	215.1	199.1	194.1
9°	374.2	291.1	236.1	201.1	184.1	182.1
10°	371.2	280.1	223.1	188.1	174.1	169.1
11°	364.1	268.1	209.1	177.1	160.1	156.1
12°	357.1	256.1	197.1	164.1	149.1	146.1
13°	349.1	245.1	185.1	154.1	139.1	134.1
14°	339.1	232.1	174.1	145.1	130.1	126.1
15°	328.1	220.1	164.1	134.1	122.0	119.0
16°	317.1	208.1	154.1	125.1	114.0	109.0
17°	306.1	195.1	144.1	116.0	105.0	104.0
18°	292.1	186.1	135.1	108.0	98.0	96.0
19°	277.1	173.1	125.1	102.0	93.0	92.0
20°	262.1	163.1	117.0	95.0	87.0	86.0
21°	250.1	153.1	109.0	88.0	81.0	82.0
22.5°	229.1	139.1	98.0	79.0	74.0	75.0
23°	224.1	133.1	94.0	77.0	72.0	72.0
24°	208.1	125.1	87.0	72.0	68.0	68.0
25°	196.1	115.0	83.0	67.0	64.0	65.0
26°	184.1	107.0	75.0	62.0	60.0	61.0
27°	169.1	100.0	70.0	58.0	57.0	59.0
28°	157.1	91.0	65.0	54.0	53.0	55.0
29°	145.1	85.0	61.0	50.0	51.0	53.0
30°	135.1	79.0	56.0	47.0	47.0	51.0
32.5°	110.0	65.0	47.0	40.0	42.0	46.0
35°	87.0	52.0	38.0	34.0	37.0	40.0
37.5°	69.0	42.0	31.0	29.0	32.0	36.0
40°	54.0	33.0	25.0	24.0	28.0	31.0
42.5°	43.0	27.0	21.0	20.0	23.0	26.0
45°	34.0	22.0	17.0	16.0	18.0	21.0
47.5°	26.0	17.0	14.0	13.0	15.0	17.0
50°	21.0	14.0	11.0	11.0	12.0	14.0
52.5°	16.0	11.0	9.0	9.0	10.0	11.0
55°	12.0	8.0	7.0	7.0	8.0	9.0
57.5°	9.0	7.0	6.0	6.0	6.0	7.0
60°	7.0	5.0	4.0	4.0	5.0	6.0
62.5°	5.0	4.0	3.0	4.0	4.0	5.0
65°	4.0	3.0	3.0	3.0	3.0	4.0



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CANDELA DISTRIBUTION (continued):

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