

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: P277712

Luminaire Tested: **ML4D09_D2WE - TIR50AWW25 - TL43R2GMWWB - TL44S2GMWWB**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P277712
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-893-17)
Test Lab: INNOVATION CENTER(G3)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: ML4D09_D2WE - TIR50AWW25 - TL43R2GMWWB - TL44S2GMWWB
Description: ML4 900LM 3000K, D2W, 25° ASYMM WW, WITH ROUND WITH ROUND DIFFUSED CLEAR LENS, MATTE WHITE FLANGE, WHITE LENS FRAME
Light Source: (1) HIGH LUMEN LED 90CRI / 3000K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 399.2 lumens
Efficiency: N/A
Efficacy: 33.3 lumens/watt
Spacing Criteria (0/90/45): 1.31 / 0.61 / 0.86
Luminous Opening: Circular (Dia: 0.17' x H: 0')
CIE Type: Direct

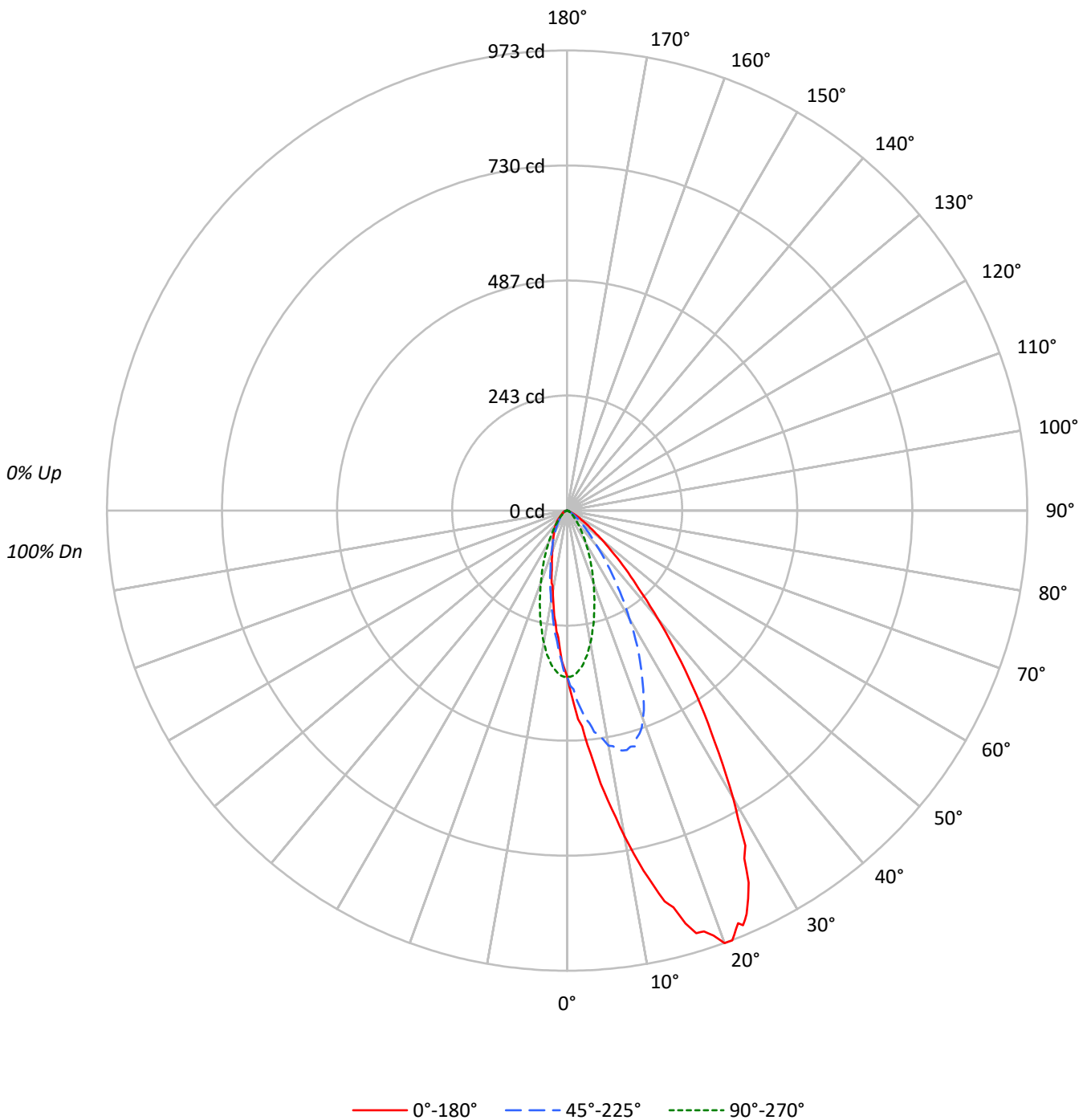
Input Watts (W): 12
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	104	110	107	105	103	103	101	99	100	98	97	96	95	94					92				
2	106	101	96	93	104	99	95	92	96	92	90	93	90	88	90	88	86					84				
3	100	93	88	83	98	92	87	83	89	85	81	87	83	80	84	81	79					77				
4	95	86	80	75	93	85	79	75	83	78	74	81	77	73	79	75	72					71				
5	89	80	74	69	88	79	73	69	77	72	68	76	71	67	74	70	67					65				
6	84	75	68	63	83	74	68	63	72	67	63	71	66	62	69	65	62					60				
7	80	70	63	59	78	69	63	58	68	62	58	66	61	58	65	61	57					56				
8	76	65	59	54	74	65	58	54	64	58	54	62	57	54	61	57	53					52				
9	72	61	55	51	71	61	55	50	60	54	50	59	54	50	58	53	50					49				
10	68	58	51	47	67	57	51	47	56	51	47	56	51	47	55	50	47					45				

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	172584	172584	172584
5°	246493	165319	127184
10°	350493	142181	87122
15°	443616	112832	63286
20°	511077	85530	48252
25°	492885	63094	38651
30°	400275	45007	31904
35°	287721	31320	27706
40°	191801	21254	23186
45°	121338	15350	18839
50°	73609	11513	14584
55°	43009	8602	12043
60°	24669	6907	10854
65°	12842	5837	9339
70°	7213	4328	10098
75°	3813	5719	9531
80°	5683	5683	11365
85°	5661	5661	11322



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	33.9	8.5
10°-20°	96.7	24.2
20°-30°	118.3	29.6
30°-40°	82.0	20.5
40°-50°	39.8	10.0
50°-60°	16.9	4.2
60°-70°	6.9	1.7
70°-80°	3.4	0.9
80°-90°	1.4	0.4
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°	248.8	62.3
0°-40°	330.8	82.9
0°-60°	387.5	97.1
0°-90°	399.2	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	399.2	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	350	350	350	350	350	
5°	498	441	334	268	257	54
15°	868	517	221	138	124	248
25°	905	371	116	70	71	403
35°	478	169	52	37	46	300
45°	174	59	22	19	27	138
55°	50	21	10	10	14	48
65°	11	6	5	6	8	13
75°	2	2	3	4	5	3
85°	1	1	1	2	2	1
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°	349.8	349.8	349.8	349.8	349.8	349.8	349.8	349.8	349.8	349.8	349.8
1°	380.8	369.8	369.8	370.8	374.8	370.8	365.8	370.8	366.8	367.8	369.8
2°	409.7	403.7	400.7	398.8	401.7	396.8	398.8	393.8	390.8	386.8	377.8
3°	441.7	428.7	427.7	427.7	426.7	422.7	423.7	418.7	412.7	403.7	402.7
4°	457.7	464.7	460.7	453.7	452.7	449.7	451.7	439.7	434.7	428.7	421.7
5°	497.7	496.7	494.7	483.7	488.7	481.7	475.7	468.7	457.7	451.7	440.7
6°	534.7	530.7	521.7	520.7	518.7	509.7	501.7	495.7	484.7	465.7	451.7
7°	581.6	568.6	558.7	557.7	547.7	539.7	533.7	522.7	503.7	487.7	471.7
8°	618.6	609.6	599.6	592.6	582.6	575.6	564.6	544.7	524.7	505.7	478.7
9°	656.6	647.6	637.6	616.6	612.6	601.6	594.6	570.6	545.7	517.7	490.7
10°	699.6	690.6	670.6	655.6	644.6	633.6	622.6	596.6	564.6	537.7	504.7
11°	739.5	726.5	717.6	694.6	677.6	663.6	645.6	616.6	585.6	548.7	507.7
12°	778.5	765.5	739.5	732.5	705.6	688.6	671.6	640.6	598.6	557.7	517.7
13°	814.5	800.5	786.5	753.5	734.5	712.6	695.6	654.6	608.6	565.6	520.7
14°	851.5	831.5	806.5	784.5	751.5	737.5	712.6	670.6	616.6	570.6	521.7
15°	868.5	868.5	846.5	810.5	775.5	753.5	731.5	679.6	625.6	572.6	516.7
16°	908.4	896.4	873.5	832.5	796.5	768.5	739.5	688.6	625.6	569.6	518.7
17°	934.4	920.4	892.4	854.5	800.5	779.5	749.5	688.6	628.6	565.6	502.7
18°	935.4	941.4	907.4	859.5	814.5	784.5	751.5	686.6	618.6	557.7	495.7
19°	950.4	954.4	910.4	873.5	819.5	784.5	750.5	680.6	610.6	545.7	484.7
20°	973.4	954.4	923.4	872.5	813.5	778.5	742.5	671.6	600.6	530.7	468.7
21°	973.4	951.4	918.4	862.5	808.5	768.5	730.5	662.6	583.6	516.7	452.7
22.5°	944.4	943.4	905.4	848.5	781.5	744.5	706.6	632.6	557.7	484.7	420.7
23°	952.4	937.4	891.4	834.5	766.5	738.5	695.6	621.6	544.7	476.7	412.7
24°	933.4	915.4	872.5	811.5	743.5	709.6	670.6	599.6	521.7	453.7	390.8
25°	905.4	891.4	846.5	790.5	724.5	685.6	651.6	573.6	500.7	429.7	370.8
26°	875.5	864.5	818.5	762.5	693.6	658.6	617.6	548.7	470.7	409.7	349.8
27°	825.5	819.5	777.5	728.5	667.6	627.6	587.6	518.7	446.7	384.8	331.8
28°	802.5	784.5	745.5	685.6	625.6	594.6	556.7	490.7	418.7	359.8	307.8
29°	745.5	743.5	708.6	648.6	587.6	557.7	521.7	455.7	393.8	336.8	284.8
30°	702.6	695.6	661.6	605.6	548.7	519.7	482.7	427.7	366.8	312.8	262.8
32.5°	580.6	580.6	549.7	505.7	452.7	427.7	401.7	347.8	297.8	250.8	213.9
35°	477.7	474.7	440.7	410.7	364.8	343.8	320.8	276.8	233.9	197.9	168.9
37.5°	380.8	373.8	351.8	320.8	289.8	269.8	252.8	216.9	181.9	152.9	130.9
40°	297.8	289.8	269.8	250.8	219.9	205.9	193.9	165.9	138.9	116.9	98.9
42.5°	223.9	224.9	209.9	192.9	171.9	158.9	148.9	125.9	106.9	90.9	76.0
45°	173.9	168.9	157.9	146.9	131.9	119.9	112.9	95.9	80.9	69.0	59.0
47.5°	128.9	126.9	119.9	109.9	98.9	89.9	83.9	73.0	62.0	53.0	45.0
50°	95.9	93.9	88.9	80.9	73.0	68.0	64.0	55.0	48.0	40.0	35.0
52.5°	68.0	69.0	66.0	59.0	53.0	50.0	47.0	41.0	36.0	31.0	27.0
55°	50.0	50.0	47.0	43.0	39.0	37.0	35.0	30.0	27.0	23.0	21.0
57.5°	36.0	35.0	34.0	31.0	28.0	27.0	25.0	22.0	19.0	17.0	15.0
60°	25.0	25.0	23.0	22.0	20.0	19.0	18.0	16.0	14.0	12.0	11.0
62.5°	17.0	17.0	16.0	15.0	14.0	13.0	12.0	11.0	10.0	9.0	8.0
65°	11.0	12.0	11.0	10.0	9.0	9.0	9.0	8.0	7.0	6.0	6.0



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	8.0	8.0	7.0	7.0	6.0	6.0	6.0	5.0	5.0	4.0	4.0
70°	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0
72.5°	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
75°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
77.5°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
80°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
82.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
85°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
87.5°	0.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0
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°	349.8	349.8	349.8	349.8	349.8	349.8
1°	356.8	351.8	343.8	341.8	335.8	334.8
2°	366.8	349.8	332.8	320.8	316.8	318.8
3°	377.8	345.8	319.8	302.8	294.8	292.8
4°	382.8	339.8	307.8	284.8	274.8	268.8
5°	383.8	333.8	297.8	267.8	253.8	256.8
6°	383.8	326.8	282.8	255.8	237.9	236.9
7°	386.8	315.8	268.8	236.9	221.9	223.9
8°	384.8	307.8	253.8	221.9	206.9	205.9
9°	379.8	294.8	238.9	208.9	192.9	189.9
10°	380.8	283.8	225.9	193.9	178.9	173.9
11°	370.8	271.8	213.9	181.9	166.9	161.9
12°	361.8	257.8	200.9	169.9	157.9	156.9
13°	355.8	246.8	187.9	158.9	145.9	146.9
14°	346.8	234.9	175.9	148.9	136.9	134.9
15°	330.8	220.9	165.9	137.9	127.9	123.9
16°	318.8	208.9	154.9	127.9	118.9	116.9
17°	304.8	197.9	144.9	119.9	111.9	110.9
18°	290.8	184.9	133.9	112.9	104.9	102.9
19°	275.8	173.9	126.9	104.9	98.9	96.9
20°	264.8	162.9	117.9	97.9	91.9	91.9
21°	245.8	152.9	109.9	91.9	86.9	86.9
22.5°	225.9	137.9	98.9	81.9	79.0	80.9
23°	216.9	133.9	94.9	79.0	77.0	78.0
24°	204.9	123.9	88.9	75.0	72.0	75.0
25°	191.9	115.9	82.9	70.0	69.0	71.0
26°	178.9	106.9	77.0	65.0	65.0	67.0
27°	168.9	98.9	72.0	61.0	62.0	64.0
28°	155.9	91.9	67.0	56.0	59.0	61.0
29°	143.9	84.9	62.0	53.0	55.0	58.0
30°	132.9	79.0	58.0	50.0	52.0	56.0
32.5°	105.9	64.0	48.0	43.0	47.0	51.0
35°	83.9	52.0	40.0	37.0	42.0	46.0
37.5°	66.0	42.0	33.0	32.0	37.0	42.0
40°	52.0	33.0	27.0	27.0	33.0	36.0
42.5°	41.0	28.0	23.0	23.0	28.0	32.0
45°	32.0	22.0	19.0	19.0	23.0	27.0
47.5°	26.0	19.0	16.0	16.0	19.0	22.0
50°	21.0	15.0	13.0	13.0	16.0	19.0
52.5°	16.0	13.0	11.0	12.0	14.0	16.0
55°	13.0	10.0	10.0	10.0	12.0	14.0
57.5°	10.0	9.0	8.0	9.0	10.0	12.0
60°	8.0	7.0	7.0	8.0	9.0	11.0
62.5°	6.0	6.0	6.0	7.0	8.0	9.0
65°	5.0	5.0	5.0	6.0	7.0	8.0



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CANDELA DISTRIBUTION (continued):

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	4.0	4.0	4.0	5.0	7.0	7.0
70°	3.0	3.0	4.0	5.0	6.0	7.0
72.5°	3.0	3.0	4.0	5.0	5.0	6.0
75°	2.0	3.0	3.0	4.0	5.0	5.0
77.5°	2.0	2.0	3.0	4.0	4.0	5.0
80°	2.0	2.0	2.0	3.0	4.0	4.0
82.5°	1.0	2.0	2.0	2.0	3.0	3.0
85°	1.0	1.0	1.0	2.0	2.0	2.0
87.5°	1.0	1.0	1.0	1.0	1.0	1.0
90°	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)