

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: P277713

Luminaire Tested: **ML4D09_D2WE - TIR50AWW25 - TL45R6GMWWB - TL46S6GMWWB**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P277713
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-893-18)
Test Lab: INNOVATION CENTER(G3)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: ML4D09_D2WE - TIR50AWW25 - TL45R6GMWWB - TL46S6GMWWB
Description: ML4 900LM 3000K, D2W, 25° ASYMM WW, WITH ROUND ASYMM WW, LINEAR SPREAD 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: 352.1 lumens
Efficiency: N/A
Efficacy: 29.3 lumens/watt
Spacing Criteria (0/90/45): 1.26 / 0.78 / 1.06
Luminous Opening: Circular (Dia: 0.17' x H: 0')
CIE Type: Direct

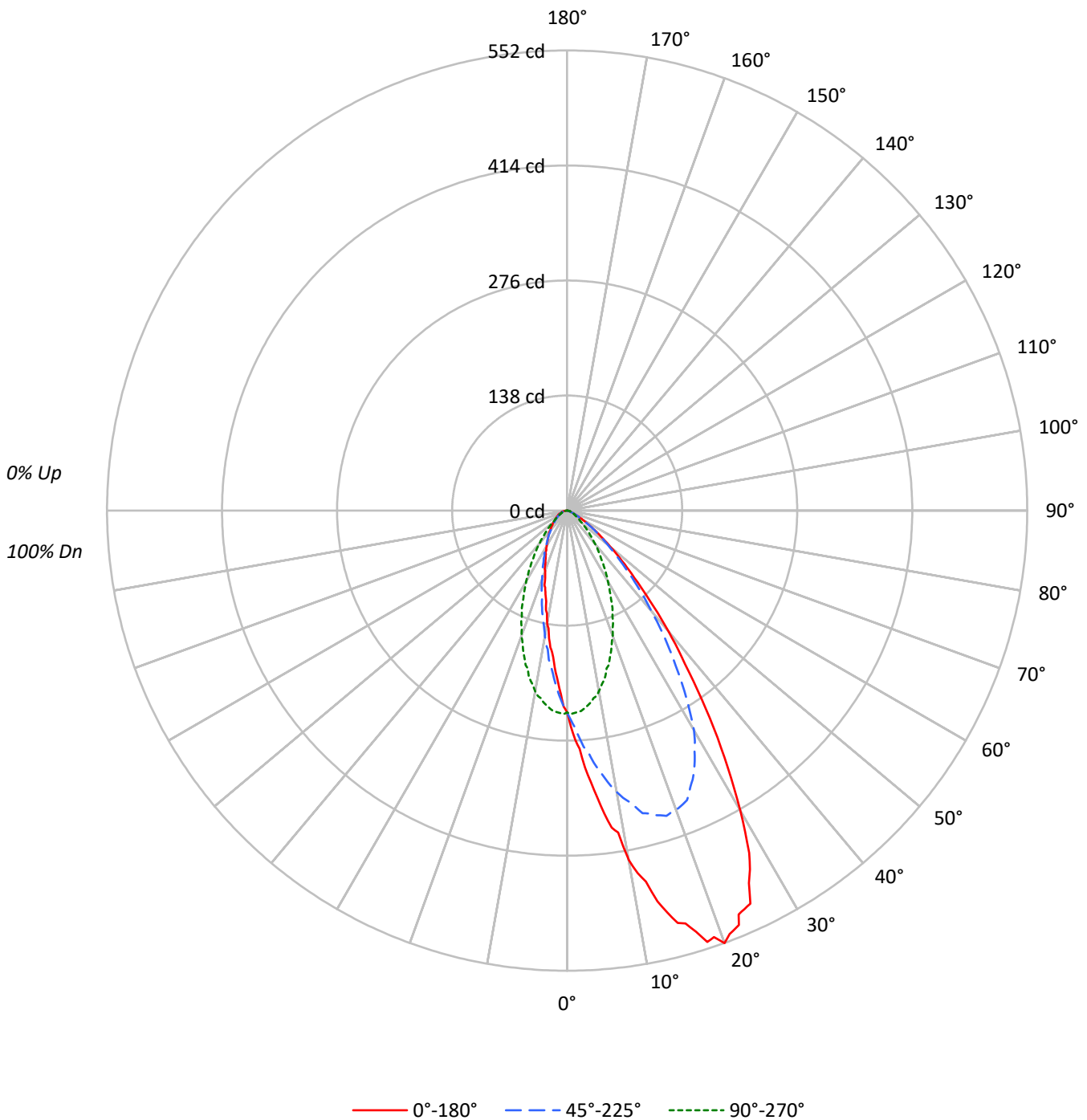
Input Watts (W): 12
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	112	109	106	103	110	107	104	102	103	100	98	99	97	95	95	94	93	91					91			
2	105	99	95	90	103	98	93	89	94	91	87	91	88	86	88	86	84	82					82			
3	99	91	85	80	97	90	84	80	87	82	78	84	80	77	82	79	76	74					74			
4	93	84	77	72	91	82	76	71	80	75	71	78	73	70	76	72	69	67					67			
5	87	77	70	65	85	76	69	65	74	68	64	72	67	63	71	66	63	61					61			
6	82	71	64	59	80	70	64	59	69	63	58	67	62	58	66	61	58	56					56			
7	77	66	59	54	75	65	59	54	64	58	54	63	57	53	61	57	53	51					51			
8	72	61	54	50	71	61	54	50	60	54	49	58	53	49	57	53	49	47					47			
9	68	57	51	46	67	57	50	46	56	50	46	55	49	45	54	49	45	44					44			
10	65	54	47	43	64	53	47	43	52	46	42	51	46	42	51	46	42	41					41			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	119447	119447	119447
5°	162001	117922	90188
10°	213472	110268	69137
15°	261624	98122	51589
20°	289929	84007	40428
25°	283189	70226	33207
30°	236485	55831	27916
35°	174729	43366	24092
40°	121792	33491	21254
45°	79543	25119	18141
50°	52194	17654	15351
55°	32687	13763	14623
60°	19735	10854	13815
65°	10507	9339	12842
70°	5770	8655	11540
75°	3813	7625	11438
80°	2841	5683	14206
85°	5661	5661	11322



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	23.6	6.7
10°-20°	69.8	19.8
20°-30°	96.1	27.3
30°-40°	79.7	22.6
40°-50°	45.9	13.0
50°-60°	21.8	6.2
60°-70°	9.4	2.7
70°-80°	4.3	1.2
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°	189.6	53.8
0°-40°	269.3	76.5
0°-60°	336.9	95.7
0°-90°	352.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	352.1	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	242	242	242	242	242	
5°	327	291	238	196	182	34
15°	512	376	192	117	101	144
25°	520	356	129	67	61	231
35°	290	227	72	40	40	182
45°	114	102	36	24	26	91
55°	38	37	16	15	17	36
65°	9	9	8	9	11	10
75°	2	2	4	5	6	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°	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1
1°	259.1	257.1	258.1	255.1	254.1	254.1	252.1	254.1	250.1	251.1	251.1
2°	275.1	275.1	270.1	271.1	268.1	269.1	267.1	267.1	259.1	263.1	260.1
3°	286.1	290.1	289.1	287.1	285.1	286.1	277.1	281.1	279.1	273.1	272.1
4°	309.1	304.1	306.1	302.1	302.1	301.1	297.1	297.1	290.1	288.1	284.1
5°	327.1	324.1	325.1	324.1	319.1	315.1	315.1	309.1	305.1	299.1	291.1
6°	346.1	348.1	342.1	342.1	335.1	332.1	331.1	324.1	319.1	309.1	304.1
7°	366.1	365.1	362.1	359.1	348.1	352.1	344.1	343.1	334.1	325.1	314.1
8°	384.1	388.1	378.1	377.1	367.1	369.1	362.1	355.1	345.1	337.1	324.1
9°	391.1	404.1	401.1	395.1	389.1	382.1	374.1	369.1	355.1	344.1	334.1
10°	426.1	422.1	416.1	414.1	404.1	400.1	391.1	384.1	372.1	357.1	343.1
11°	443.1	442.1	434.1	430.1	414.1	415.1	410.1	391.1	377.1	365.1	351.1
12°	455.1	462.1	457.1	449.1	437.1	429.1	424.1	410.1	392.1	377.1	357.1
13°	481.1	478.1	475.1	466.1	451.1	446.1	429.1	424.1	406.1	385.1	365.1
14°	497.2	496.2	490.1	480.1	469.1	459.1	452.1	431.1	415.1	396.1	374.1
15°	512.2	515.2	503.2	495.2	478.1	475.1	465.1	444.1	424.1	400.1	376.1
16°	515.2	527.2	517.2	508.2	493.1	483.1	474.1	449.1	430.1	405.1	380.1
17°	528.2	536.2	534.2	515.2	501.2	493.1	480.1	459.1	435.1	409.1	382.1
18°	544.2	546.2	541.2	525.2	509.2	500.2	483.1	466.1	439.1	412.1	385.1
19°	541.2	553.2	542.2	529.2	514.2	505.2	492.1	468.1	442.1	412.1	383.1
20°	552.2	553.2	536.2	533.2	510.2	507.2	487.1	472.1	442.1	412.1	382.1
21°	544.2	553.2	545.2	531.2	514.2	503.2	492.1	472.1	441.1	411.1	380.1
22.5°	538.2	546.2	529.2	527.2	504.2	500.2	487.1	460.1	434.1	405.1	376.1
23°	526.2	543.2	535.2	524.2	504.2	498.2	484.1	459.1	429.1	402.1	372.1
24°	523.2	533.2	526.2	513.2	491.1	487.1	474.1	453.1	422.1	395.1	363.1
25°	520.2	522.2	513.2	501.2	489.1	476.1	465.1	441.1	420.1	386.1	356.1
26°	497.2	507.2	494.2	488.1	471.1	463.1	448.1	436.1	408.1	383.1	347.1
27°	483.1	486.1	479.1	471.1	459.1	452.1	438.1	418.1	397.1	367.1	337.1
28°	465.1	467.1	454.1	450.1	444.1	435.1	418.1	404.1	379.1	354.1	325.1
29°	440.1	445.1	439.1	432.1	421.1	416.1	403.1	390.1	364.1	346.1	316.1
30°	415.1	420.1	413.1	407.1	393.1	392.1	384.1	371.1	350.1	331.1	304.1
32.5°	351.1	363.1	352.1	347.1	343.1	337.1	329.1	318.1	305.1	294.1	266.1
35°	290.1	296.1	289.1	291.1	282.1	282.1	274.1	274.1	255.1	245.1	227.1
37.5°	232.1	235.1	237.1	231.1	228.1	236.1	224.1	220.1	211.1	202.1	192.1
40°	189.1	190.1	189.1	188.1	183.1	187.1	182.1	178.1	171.1	167.1	157.0
42.5°	147.0	150.0	150.0	148.0	145.0	151.0	144.0	143.0	141.0	136.0	128.0
45°	114.0	118.0	116.0	116.0	116.0	117.0	115.0	113.0	110.0	107.0	102.0
47.5°	89.0	90.0	91.0	90.0	90.0	90.0	90.0	89.0	87.0	84.0	80.0
50°	68.0	68.0	69.0	69.0	70.0	70.0	69.0	70.0	68.0	66.0	63.0
52.5°	51.0	53.0	51.0	52.0	53.0	52.0	52.0	54.0	53.0	52.0	49.0
55°	38.0	38.0	39.0	39.0	39.0	39.0	40.0	40.0	40.0	39.0	37.0
57.5°	28.0	28.0	28.0	28.0	28.0	29.0	29.0	30.0	29.0	28.0	27.0
60°	20.0	21.0	20.0	20.0	20.0	21.0	21.0	21.0	21.0	20.0	19.0
62.5°	14.0	14.0	14.0	14.0	15.0	15.0	15.0	15.0	15.0	14.0	14.0
65°	9.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.0



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0	6.0
70°	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	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	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°	242.1	242.1	242.1	242.1	242.1	242.1
1°	250.1	244.1	238.1	235.1	235.1	235.1
2°	255.1	243.1	232.1	226.1	220.1	220.1
3°	260.1	242.1	227.1	217.1	207.1	206.1
4°	264.1	241.1	220.1	207.1	198.1	195.1
5°	268.1	238.1	212.1	196.1	187.1	182.1
6°	269.1	235.1	207.1	187.1	177.1	171.1
7°	274.1	232.1	198.1	180.1	167.1	165.1
8°	278.1	227.1	193.1	168.1	156.0	155.0
9°	280.1	225.1	183.1	162.0	148.0	143.0
10°	279.1	220.1	178.1	153.0	139.0	138.0
11°	276.1	214.1	170.1	144.0	131.0	126.0
12°	278.1	209.1	163.0	137.0	123.0	122.0
13°	279.1	204.1	156.0	130.0	116.0	112.0
14°	276.1	195.1	149.0	124.0	109.0	106.0
15°	271.1	192.1	142.0	117.0	103.0	101.0
16°	270.1	185.1	135.0	109.0	98.0	96.0
17°	267.1	179.1	129.0	104.0	93.0	93.0
18°	260.1	172.1	123.0	99.0	87.0	85.0
19°	256.1	165.1	117.0	93.0	84.0	81.0
20°	252.1	160.0	111.0	88.0	79.0	77.0
21°	245.1	152.0	105.0	83.0	75.0	75.0
22.5°	238.1	144.0	97.0	77.0	69.0	68.0
23°	234.1	139.0	95.0	75.0	68.0	67.0
24°	228.1	134.0	90.0	71.0	64.0	63.0
25°	220.1	129.0	85.0	67.0	61.0	61.0
26°	212.1	121.0	79.0	64.0	59.0	58.0
27°	206.1	115.0	76.0	60.0	56.0	57.0
28°	196.1	109.0	71.0	58.0	54.0	53.0
29°	189.1	103.0	67.0	54.0	51.0	52.0
30°	181.1	98.0	64.0	51.0	49.0	49.0
32.5°	159.0	85.0	55.0	45.0	44.0	44.0
35°	139.0	72.0	47.0	40.0	39.0	40.0
37.5°	118.0	62.0	41.0	35.0	35.0	36.0
40°	100.0	52.0	34.0	30.0	31.0	33.0
42.5°	83.0	43.0	30.0	27.0	28.0	29.0
45°	66.0	36.0	25.0	24.0	25.0	26.0
47.5°	52.0	29.0	22.0	21.0	22.0	23.0
50°	40.0	23.0	19.0	19.0	20.0	20.0
52.5°	31.0	19.0	16.0	17.0	18.0	18.0
55°	23.0	16.0	14.0	15.0	16.0	17.0
57.5°	17.0	13.0	12.0	13.0	14.0	15.0
60°	13.0	11.0	11.0	12.0	13.0	14.0
62.5°	10.0	10.0	10.0	10.0	12.0	12.0
65°	8.0	8.0	8.0	9.0	10.0	11.0



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CANDELA DISTRIBUTION (continued):

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	6.0	7.0	7.0	8.0	9.0	10.0
70°	5.0	6.0	6.0	7.0	8.0	8.0
72.5°	4.0	5.0	5.0	6.0	7.0	7.0
75°	3.0	4.0	5.0	5.0	6.0	6.0
77.5°	2.0	3.0	4.0	5.0	5.0	6.0
80°	2.0	2.0	3.0	4.0	4.0	5.0
82.5°	2.0	2.0	2.0	3.0	3.0	3.0
85°	1.0	1.0	1.0	2.0	2.0	2.0
87.5°	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

(END OF REPORT)