

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: P275384

Luminaire Tested: **ML4D09\_927 - TIR50AWW25 - TL45R6GMWBB - TL46S6GMWBB**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P275384  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-901-20)  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO  
Catalog Number: ML4D09\_927 - TIR50AWW25 - TL45R6GMWBB - TL46S6GMWBB  
Description: ML4 900LM 2700K, 90CRI, 25° ASYMM WW, WITH SQUARE ASYMM WW, LINEAR SPREAD LENS, MATTE WHITE FLANGE, BLACK LENS FRAME  
Light Source: (1) HIGH LUMEN LED 90CRI / 2700K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 607.3 lumens  
Efficiency: N/A  
Efficacy: 53.7 lumens/watt  
Spacing Criteria (0/90/45): 1.32 / 0.78 / 1.11  
Luminous Opening: Rectangular (W 0.17' x L: 0.17' x H: 0')  
CIE Type: Direct

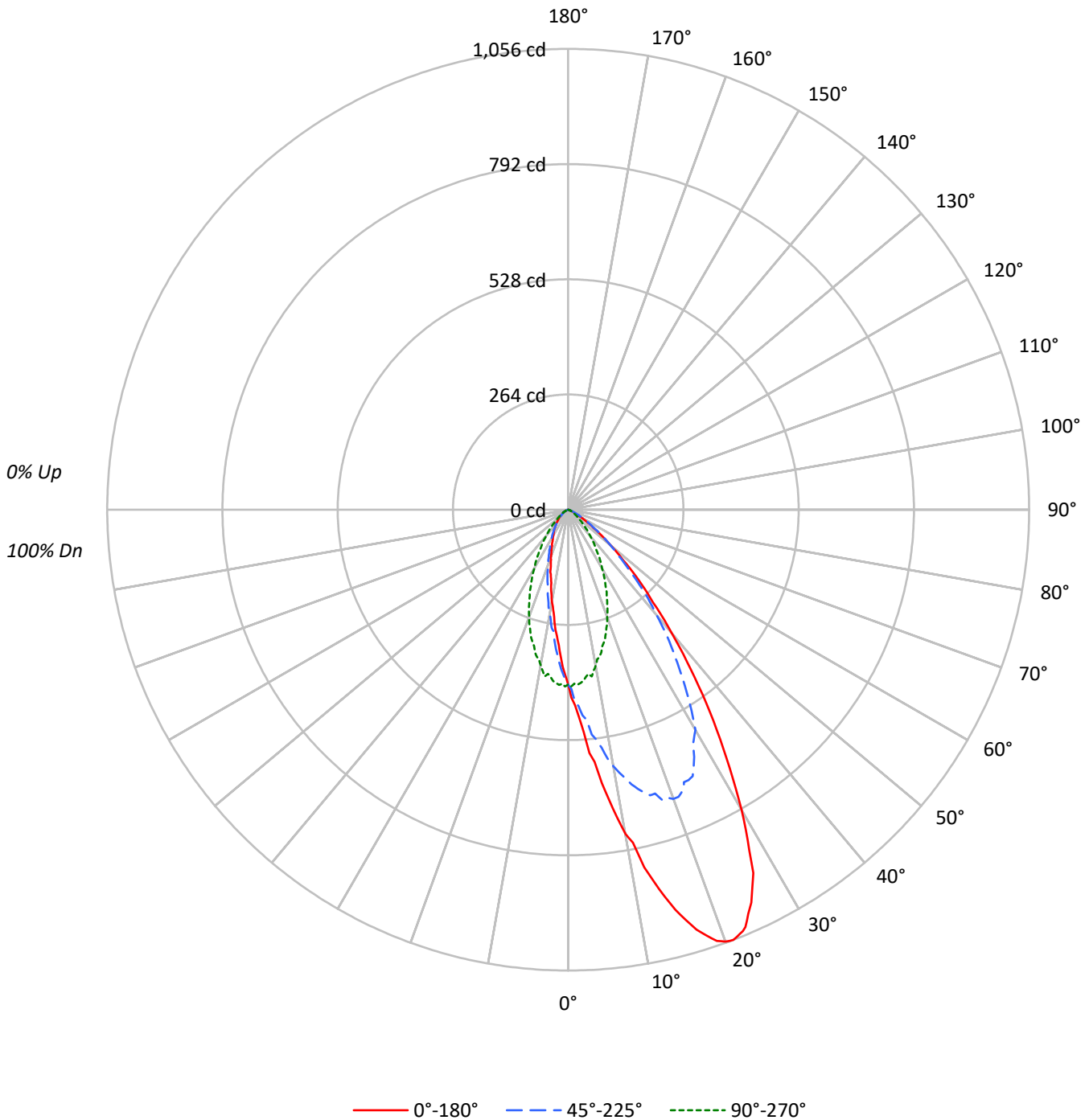
Input Watts (W): 11.3  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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	109	107	104	110	107	105	102	103	101	99	99	98	96	96	95	94	92					92			
2	106	100	96	92	104	99	94	91	95	92	89	92	89	87	89	87	85	83					83			
3	99	92	86	82	97	91	85	81	88	83	80	85	82	78	83	80	77	75					75			
4	93	85	78	73	91	83	77	73	81	76	72	79	75	71	77	73	70	69					69			
5	88	78	71	66	86	77	71	66	75	70	65	73	69	65	72	68	64	62					62			
6	82	72	65	60	81	71	65	60	70	64	60	68	63	59	67	62	59	57					57			
7	78	67	60	55	76	66	60	55	65	59	55	64	58	54	62	58	54	52					52			
8	73	62	55	51	72	62	55	51	60	55	50	59	54	50	58	54	50	48					48			
9	69	58	51	47	68	58	51	47	57	51	47	56	50	46	55	50	46	45					45			
10	65	54	48	43	64	54	48	43	53	47	43	52	47	43	51	46	43	41					41			

**AVERAGE LUMINANCE (cd/sqm):**

	0°	90°	180°
0°	155039	155039	155039
5°	217867	153297	113193
10°	296721	142872	84204
15°	380790	126408	61379
20°	434306	107628	48247
25°	424651	88932	37625
30°	355317	69354	30426
35°	267793	53455	26491
40°	186707	39962	21751
45°	126042	28496	18084
50°	76561	19291	13865
55°	43913	13512	10809
60°	21700	10075	8525
65°	9169	7335	6418
70°	3399	4532	3399
75°	1497	2994	1497
80°	2232	2232	0
85°	0	0	0



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	39.4	6.5
10°-20°	121.5	20.0
20°-30°	173.2	28.5
30°-40°	144.4	23.8
40°-50°	81.8	13.5
50°-60°	34.2	5.6
60°-70°	10.6	1.8
70°-80°	2.0	0.3
80°-90°	0.1	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°	334.1	55.0
0°-40°	478.5	78.8
0°-60°	594.5	97.9
0°-90°	607.3	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	607.3	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	400	400	400	400	400	
5°	560	483	394	321	291	59
15°	949	671	315	180	153	269
25°	993	674	208	102	88	445
35°	566	442	113	57	56	353
45°	230	204	52	31	33	179
55°	65	71	20	16	16	63
65°	10	17	8	7	7	12
75°	1	2	2	1	1	2
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°	400.1	400.1	400.1	400.1	400.1	400.1	400.1	400.1	400.1	400.1	400.1
1°	431.1	422.1	422.1	425.1	426.1	424.1	422.1	422.1	424.1	420.1	411.1
2°	448.1	459.1	442.1	456.1	450.1	448.1	449.1	448.1	444.1	440.1	438.1
3°	477.1	487.1	483.1	485.1	484.1	477.1	479.1	475.1	469.1	459.1	451.1
4°	511.1	522.1	508.1	518.1	513.1	511.1	505.1	499.1	497.1	479.1	472.1
5°	560.1	547.1	548.1	549.1	544.1	533.1	533.1	527.1	524.1	500.1	483.1
6°	581.1	571.1	587.1	587.1	574.1	569.1	569.1	558.1	542.1	535.1	518.1
7°	631.1	619.1	622.1	609.1	612.1	603.1	602.1	581.1	571.1	558.1	531.1
8°	671.1	670.1	653.1	657.1	653.1	639.1	630.1	619.1	605.1	580.1	551.1
9°	713.1	710.1	694.1	695.1	689.1	669.1	671.1	650.1	621.1	594.1	578.1
10°	754.1	742.1	741.1	736.1	722.1	704.1	709.1	677.1	651.1	625.1	597.1
11°	777.1	782.1	779.1	769.1	754.1	741.1	735.1	704.1	686.1	646.1	614.1
12°	838.1	836.1	817.1	809.1	798.1	771.1	770.1	738.1	701.1	652.1	629.1
13°	875.1	864.1	852.1	836.1	823.1	815.1	799.1	768.1	734.1	666.1	646.1
14°	913.1	902.1	891.1	882.1	857.1	843.1	823.1	794.1	750.1	698.1	659.1
15°	949.2	918.1	924.2	893.1	904.1	859.1	850.1	810.1	769.1	720.1	671.1
16°	978.2	966.2	958.2	944.2	923.2	891.1	879.1	828.1	785.1	736.1	681.1
17°	1006.2	1002.2	983.2	958.2	940.2	913.1	896.1	851.1	800.1	735.1	680.1
18°	1026.2	1027.2	1006.2	989.2	959.2	934.2	918.1	864.1	825.1	755.1	700.1
19°	1045.2	1001.2	1021.2	1005.2	964.2	948.2	928.2	888.1	834.1	762.1	698.1
20°	1053.2	1024.2	1024.2	1006.2	982.2	955.2	940.2	887.1	828.1	757.1	705.1
21°	1056.2	1057.2	1036.2	998.2	987.2	966.2	941.2	889.1	842.1	765.1	705.1
22.5°	1045.2	1047.2	1027.2	1000.2	989.2	954.2	945.2	881.1	827.1	749.1	692.1
23°	1039.2	1030.2	1021.2	1004.2	972.2	946.2	930.2	881.1	821.1	745.1	678.1
24°	1014.2	1021.2	998.2	987.2	953.2	937.2	917.1	866.1	812.1	747.1	678.1
25°	993.2	987.2	978.2	966.2	938.2	915.1	900.1	862.1	806.1	732.1	674.1
26°	962.2	968.2	949.2	936.2	915.1	893.1	877.1	835.1	780.1	697.1	655.1
27°	934.2	931.2	919.1	907.1	881.1	862.1	850.1	819.1	770.1	699.1	636.1
28°	884.1	886.1	877.1	866.1	854.1	833.1	817.1	786.1	732.1	668.1	609.1
29°	840.1	848.1	834.1	814.1	825.1	791.1	780.1	748.1	705.1	645.1	595.1
30°	794.1	796.1	787.1	785.1	768.1	756.1	744.1	712.1	686.1	626.1	583.1
32.5°	674.1	678.1	675.1	671.1	660.1	658.1	646.1	616.1	597.1	550.1	513.1
35°	566.1	559.1	555.1	555.1	556.1	544.1	538.1	521.1	501.1	475.1	442.1
37.5°	460.1	456.1	454.1	450.1	452.1	447.1	446.1	443.1	424.1	401.1	380.1
40°	369.1	365.1	366.1	370.1	363.1	363.1	363.1	361.1	344.1	326.1	314.1
42.5°	287.0	288.0	288.0	292.0	293.0	291.0	287.0	284.0	276.0	265.0	262.0
45°	230.0	224.0	225.0	225.0	223.0	228.0	226.0	226.0	220.0	210.0	204.0
47.5°	170.0	168.0	170.0	174.0	174.0	174.0	176.0	175.0	174.0	166.0	159.0
50°	127.0	126.0	130.0	129.0	131.0	131.0	132.0	134.0	135.0	127.0	126.0
52.5°	95.0	92.0	94.0	98.0	99.0	99.0	101.0	104.0	102.0	99.0	95.0
55°	65.0	66.0	69.0	71.0	72.0	71.0	73.0	76.0	76.0	73.0	71.0
57.5°	45.0	46.0	48.0	48.0	51.0	52.0	51.0	54.0	55.0	55.0	52.0
60°	28.0	29.0	31.0	32.0	34.0	35.0	36.0	39.0	40.0	38.0	37.0
62.5°	17.0	18.0	18.0	20.0	21.0	23.0	24.0	26.0	28.0	27.0	26.0
65°	10.0	10.0	10.0	11.0	13.0	14.0	15.0	16.0	18.0	18.0	17.0



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	5.0	5.0	5.0	6.0	7.0	7.0	8.0	10.0	10.0	11.0	11.0
70°	3.0	3.0	3.0	3.0	4.0	4.0	4.0	5.0	6.0	6.0	7.0
72.5°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
75°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0
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°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
82.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	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°	400.1	400.1	400.1	400.1	400.1	400.1
1°	414.1	405.1	396.1	390.1	391.1	379.1
2°	413.1	399.1	383.1	373.1	363.1	360.1
3°	426.1	402.1	374.1	357.1	343.1	335.1
4°	440.1	398.1	359.1	338.1	323.1	311.1
5°	447.1	394.1	349.1	321.1	303.0	291.0
6°	448.1	385.1	338.1	301.0	284.0	277.0
7°	455.1	379.1	326.1	280.0	268.0	258.0
8°	451.1	386.1	311.1	273.0	249.0	238.0
9°	468.1	373.1	295.0	256.0	234.0	225.0
10°	464.1	363.1	287.0	241.0	220.0	214.0
11°	472.1	349.1	275.0	233.0	206.0	200.0
12°	470.1	345.1	262.0	218.0	194.0	188.0
13°	471.1	336.1	250.0	206.0	181.0	172.0
14°	469.1	322.1	240.0	194.0	171.0	163.0
15°	466.1	315.1	227.0	180.0	161.0	153.0
16°	448.1	306.0	214.0	172.0	152.0	149.0
17°	454.1	296.0	203.0	162.0	143.0	136.0
18°	450.1	284.0	195.0	153.0	134.0	128.0
19°	434.1	274.0	184.0	143.0	127.0	121.0
20°	432.1	261.0	174.0	136.0	119.0	117.0
21°	426.1	251.0	165.0	128.0	114.0	108.0
22.5°	406.1	234.0	151.0	117.0	104.0	100.0
23°	399.1	228.0	146.0	114.0	101.0	100.0
24°	390.1	217.0	137.0	107.0	98.0	91.0
25°	382.1	208.0	131.0	102.0	91.0	88.0
26°	369.1	196.0	123.0	95.0	86.0	83.0
27°	349.1	186.0	116.0	91.0	82.0	78.0
28°	343.1	176.0	108.0	85.0	77.0	75.0
29°	330.1	167.0	102.0	80.0	72.0	71.0
30°	317.1	155.0	96.0	76.0	69.0	68.0
32.5°	275.0	136.0	81.0	66.0	61.0	61.0
35°	237.0	113.0	69.0	57.0	54.0	56.0
37.5°	211.0	96.0	58.0	49.0	48.0	48.0
40°	179.0	79.0	48.0	42.0	42.0	43.0
42.5°	150.0	65.0	40.0	36.0	37.0	37.0
45°	121.0	52.0	33.0	31.0	32.0	33.0
47.5°	95.0	41.0	27.0	26.0	28.0	28.0
50°	72.0	32.0	22.0	22.0	23.0	23.0
52.5°	54.0	26.0	18.0	19.0	20.0	20.0
55°	39.0	20.0	15.0	16.0	16.0	16.0
57.5°	29.0	16.0	12.0	13.0	14.0	13.0
60°	22.0	13.0	10.0	11.0	11.0	11.0
62.5°	16.0	10.0	8.0	9.0	9.0	8.0
65°	12.0	8.0	7.0	7.0	7.0	7.0





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**CANDELA DISTRIBUTION (continued):**

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	8.0	6.0	5.0	6.0	5.0	5.0
70°	5.0	4.0	4.0	4.0	4.0	3.0
72.5°	3.0	3.0	2.0	2.0	3.0	2.0
75°	2.0	2.0	2.0	1.0	1.0	1.0
77.5°	1.0	1.0	1.0	1.0	1.0	0.0
80°	1.0	1.0	1.0	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)