

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: P275385

Luminaire Tested: **ML4D09_930 - TIR50AWW25 - TL45R6GMWBB - TL46S6GMWBB**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P275385
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_930 - 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 / 3000K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 651.1 lumens
Efficiency: N/A
Efficacy: 57.6 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

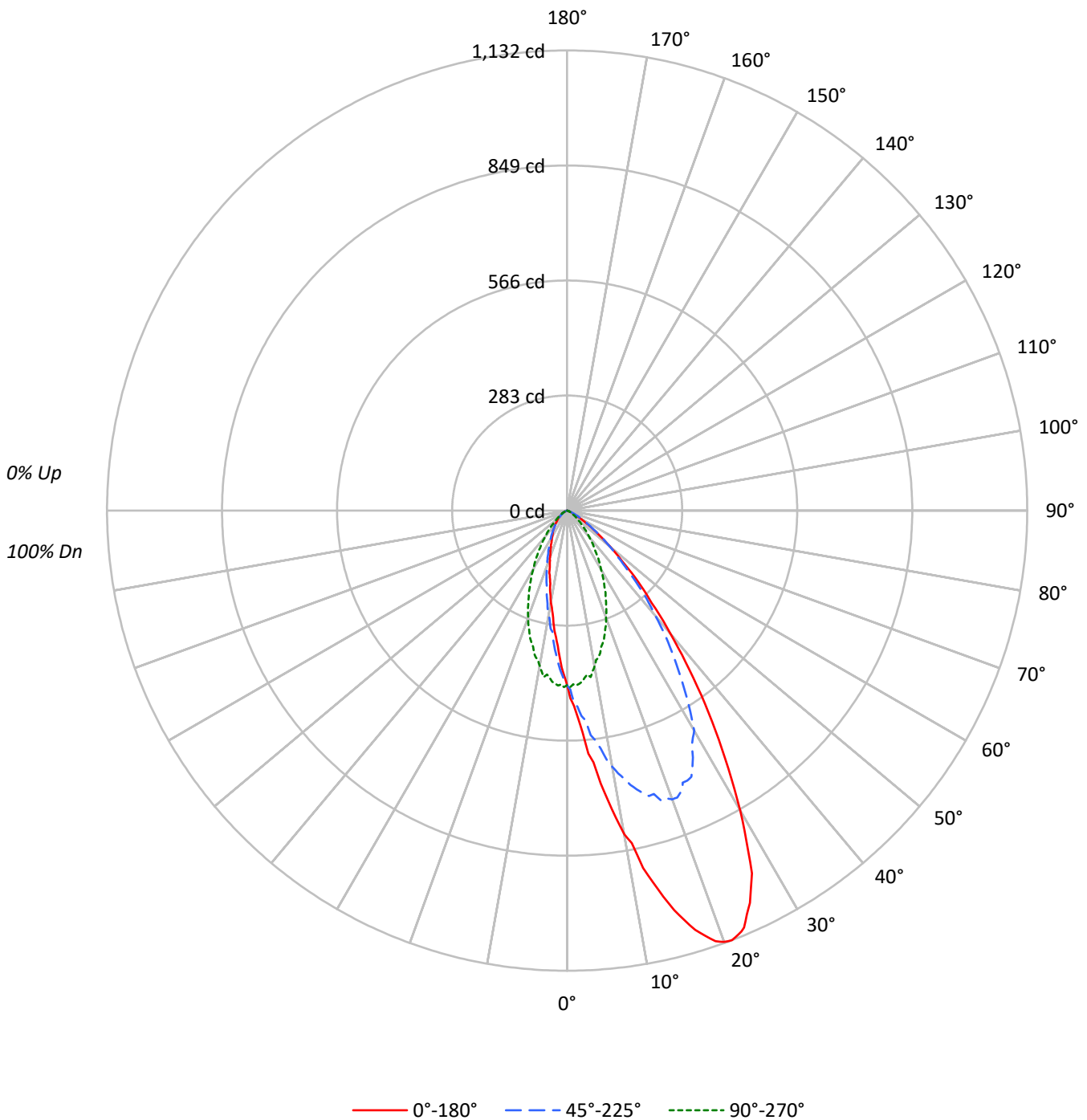
Input Watts (W): 11.3
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	53	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°	166198	166198	166198
5°	233582	164344	121362
10°	318126	153141	90303
15°	408229	135515	65832
20°	465605	115422	51752
25°	455264	95345	40362
30°	380955	74365	32619
35°	287094	57334	28383
40°	200163	42845	23319
45°	135139	30579	19399
50°	82107	20677	14890
55°	47088	14458	11620
60°	23250	10772	9145
65°	9811	7885	6877
70°	3626	4872	3626
75°	1647	3144	1647
80°	2455	2455	0
85°	0	0	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	42.3	6.5
10°-20°	130.3	20.0
20°-30°	185.7	28.5
30°-40°	154.8	23.8
40°-50°	87.7	13.5
50°-60°	36.7	5.6
60°-70°	11.4	1.8
70°-80°	2.1	0.3
80°-90°	0.2	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°	358.2	55.0
0°-40°	513.1	78.8
0°-60°	637.4	97.9
0°-90°	651.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	651.1	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	429	429	429	429	429	
5°	600	518	422	344	312	63
15°	1018	720	338	193	164	288
25°	1065	723	223	109	94	477
35°	607	474	121	61	60	379
45°	247	219	56	33	35	191
55°	70	76	21	17	17	67
65°	11	18	9	8	8	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°	428.9	428.9	428.9	428.9	428.9	428.9	428.9	428.9	428.9	428.9	428.9
1°	462.2	452.5	452.5	455.7	456.8	454.7	452.5	452.5	454.7	450.4	440.7
2°	480.4	492.2	474.0	489.0	482.5	480.4	481.5	480.4	476.1	471.8	469.7
3°	511.5	522.2	517.9	520.1	519.0	511.5	513.6	509.3	502.9	492.2	483.6
4°	547.9	559.7	544.7	555.4	550.1	547.9	541.5	535.1	532.9	513.6	506.1
5°	600.5	586.5	587.6	588.7	583.3	571.5	571.5	565.1	561.9	536.1	517.9
6°	623.0	612.3	629.4	629.4	615.5	610.1	610.1	598.3	581.2	573.7	555.4
7°	676.6	663.8	667.0	653.0	656.2	646.6	645.5	623.0	612.3	598.3	569.4
8°	719.5	718.4	700.2	704.5	700.2	685.2	675.5	663.8	648.7	621.9	590.8
9°	764.5	761.3	744.2	745.2	738.8	717.4	719.5	697.0	665.9	636.9	619.8
10°	808.5	795.6	794.6	789.2	774.2	754.9	760.3	725.9	698.1	670.2	640.2
11°	833.2	838.5	835.3	824.6	808.5	794.6	788.1	754.9	735.6	692.7	658.4
12°	898.6	896.4	876.1	867.5	855.7	826.7	825.7	791.4	751.7	699.1	674.5
13°	938.3	926.5	913.6	896.4	882.5	873.9	856.8	823.5	787.1	714.1	692.7
14°	979.0	967.2	955.4	945.8	919.0	903.9	882.5	851.4	804.2	748.5	706.6
15°	1017.6	984.4	990.8	957.6	969.4	921.1	911.5	868.6	824.6	772.1	719.5
16°	1048.7	1035.8	1027.3	1012.2	989.7	955.4	942.5	887.9	841.8	789.2	730.2
17°	1078.7	1074.4	1054.1	1027.3	1008.0	979.0	960.8	912.5	857.8	788.1	729.2
18°	1100.2	1101.2	1078.7	1060.5	1028.3	1001.5	984.4	926.5	884.6	809.6	750.6
19°	1120.6	1073.4	1094.8	1077.7	1033.7	1016.5	995.1	952.2	894.3	817.1	748.5
20°	1129.1	1098.0	1098.0	1078.7	1053.0	1024.0	1008.0	951.1	887.9	811.7	756.0
21°	1132.3	1133.4	1110.9	1070.2	1058.4	1035.8	1009.0	953.3	902.9	820.3	756.0
22.5°	1120.6	1122.7	1101.2	1072.3	1060.5	1023.0	1013.3	944.7	886.8	803.2	742.0
23°	1114.1	1104.5	1094.8	1076.6	1042.3	1014.4	997.2	944.7	880.4	798.9	727.0
24°	1087.3	1094.8	1070.2	1058.4	1021.9	1004.7	983.3	928.6	870.7	801.0	727.0
25°	1064.8	1058.4	1048.7	1035.8	1005.8	981.2	965.1	924.3	864.3	784.9	722.7
26°	1031.5	1038.0	1017.6	1003.7	981.2	957.6	940.4	895.4	836.4	747.4	702.4
27°	1001.5	998.3	985.4	972.6	944.7	924.3	911.5	878.2	825.7	749.5	682.0
28°	947.9	950.1	940.4	928.6	915.7	893.2	876.1	842.8	784.9	716.3	653.0
29°	900.7	909.3	894.3	872.8	884.6	848.2	836.4	802.1	756.0	691.6	638.0
30°	851.4	853.5	843.9	841.8	823.5	810.7	797.8	763.5	735.6	671.3	625.1
32.5°	722.7	727.0	723.8	719.5	707.7	705.6	692.7	660.5	640.2	589.8	550.1
35°	606.9	599.4	595.1	595.1	596.2	583.3	576.9	558.7	537.2	509.3	474.0
37.5°	493.3	489.0	486.8	482.5	484.7	479.3	478.2	475.0	454.7	430.0	407.5
40°	395.7	391.4	392.5	396.7	389.2	389.2	389.2	387.1	368.9	349.6	336.7
42.5°	307.7	308.8	308.8	313.1	314.2	312.0	307.7	304.5	296.0	284.2	280.9
45°	246.6	240.2	241.3	241.3	239.1	244.5	242.3	242.3	235.9	225.2	218.7
47.5°	182.3	180.1	182.3	186.6	186.6	186.6	188.7	187.7	186.6	178.0	170.5
50°	136.2	135.1	139.4	138.3	140.5	140.5	141.5	143.7	144.8	136.2	135.1
52.5°	101.9	98.7	100.8	105.1	106.2	106.2	108.3	111.5	109.4	106.2	101.9
55°	69.7	70.8	74.0	76.1	77.2	76.1	78.3	81.5	81.5	78.3	76.1
57.5°	48.3	49.3	51.5	51.5	54.7	55.8	54.7	57.9	59.0	59.0	55.8
60°	30.0	31.1	33.2	34.3	36.5	37.5	38.6	41.8	42.9	40.7	39.7
62.5°	18.2	19.3	19.3	21.4	22.5	24.7	25.7	27.9	30.0	29.0	27.9
65°	10.7	10.7	10.7	11.8	13.9	15.0	16.1	17.2	19.3	19.3	18.2



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	5.4	5.4	5.4	6.4	7.5	7.5	8.6	10.7	10.7	11.8	11.8
70°	3.2	3.2	3.2	3.2	4.3	4.3	4.3	5.4	6.4	6.4	7.5
72.5°	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.2	3.2	3.2	3.2
75°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	2.1	2.1	2.1
77.5°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
80°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
82.5°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	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°	428.9	428.9	428.9	428.9	428.9	428.9
1°	443.9	434.3	424.6	418.2	419.3	406.4
2°	442.9	427.8	410.7	400.0	389.2	386.0
3°	456.8	431.1	401.0	382.8	367.8	359.2
4°	471.8	426.8	385.0	362.4	346.4	333.5
5°	479.3	422.5	374.2	344.2	324.9	312.0
6°	480.4	412.8	362.4	322.8	304.5	297.0
7°	487.9	406.4	349.6	300.2	287.4	276.7
8°	483.6	413.9	333.5	292.7	267.0	255.2
9°	501.8	400.0	316.3	274.5	250.9	241.3
10°	497.5	389.2	307.7	258.4	235.9	229.5
11°	506.1	374.2	294.9	249.8	220.9	214.5
12°	504.0	369.9	280.9	233.8	208.0	201.6
13°	505.1	360.3	268.1	220.9	194.1	184.4
14°	502.9	345.3	257.4	208.0	183.4	174.8
15°	499.7	337.8	243.4	193.0	172.6	164.1
16°	480.4	328.1	229.5	184.4	163.0	159.8
17°	486.8	317.4	217.7	173.7	153.3	145.8
18°	482.5	304.5	209.1	164.1	143.7	137.3
19°	465.4	293.8	197.3	153.3	136.2	129.7
20°	463.2	279.9	186.6	145.8	127.6	125.5
21°	456.8	269.1	176.9	137.3	122.2	115.8
22.5°	435.4	250.9	161.9	125.5	111.5	107.2
23°	427.8	244.5	156.6	122.2	108.3	107.2
24°	418.2	232.7	146.9	114.7	105.1	97.6
25°	409.6	223.0	140.5	109.4	97.6	94.4
26°	395.7	210.2	131.9	101.9	92.2	89.0
27°	374.2	199.4	124.4	97.6	87.9	83.6
28°	367.8	188.7	115.8	91.1	82.6	80.4
29°	353.9	179.1	109.4	85.8	77.2	76.1
30°	339.9	166.2	102.9	81.5	74.0	72.9
32.5°	294.9	145.8	86.9	70.8	65.4	65.4
35°	254.1	121.2	74.0	61.1	57.9	60.0
37.5°	226.3	102.9	62.2	52.5	51.5	51.5
40°	191.9	84.7	51.5	45.0	45.0	46.1
42.5°	160.8	69.7	42.9	38.6	39.7	39.7
45°	129.7	55.8	35.4	33.2	34.3	35.4
47.5°	101.9	44.0	29.0	27.9	30.0	30.0
50°	77.2	34.3	23.6	23.6	24.7	24.7
52.5°	57.9	27.9	19.3	20.4	21.4	21.4
55°	41.8	21.4	16.1	17.2	17.2	17.2
57.5°	31.1	17.2	12.9	13.9	15.0	13.9
60°	23.6	13.9	10.7	11.8	11.8	11.8
62.5°	17.2	10.7	8.6	9.7	9.7	8.6
65°	12.9	8.6	7.5	7.5	7.5	7.5



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CANDELA DISTRIBUTION (continued):

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	8.6	6.4	5.4	6.4	5.4	5.4
70°	5.4	4.3	4.3	4.3	4.3	3.2
72.5°	3.2	3.2	2.1	2.1	3.2	2.1
75°	2.1	2.1	2.1	1.1	1.1	1.1
77.5°	1.1	1.1	1.1	1.1	1.1	0.0
80°	1.1	1.1	1.1	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)